Digitalising Employee Voice

Dinislam Abdulgalimov

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Faculty of Information Technology

Supervisors:

Professor Patrick Olivier

Dr Reuben Kirkham

Dr Tom Bartindale

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Signature:

Print Name: …………………. Dinislam Abdulgalimov

Date:………………………………….……..10/02/2022

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Abstract

Employee voice is a phenomenon as longstanding as organised labour itself. In recent decades it has been a topic of concern to a wide range of disciplines from Human Resource Management, Organisational Behaviour, and Industrial Relations (within Business Studies) to Participatory Design, Group Support Systems & Computer-Supported Cooperative Work (within Human-Computer Interaction). Despite the fact that levels of trade union membership in most Western countries are continuing to decline, the proposition that employees need channels to communicate with management, both to raise grievances and make suggestions, remains widely accepted; and the evidence pertaining to the benefits of employee voice for the productivity of organisations and workplace wellbeing is indisputable. The challenge of digitalisation of employee voice is the task of moving beyond traditional face-to-face and analogue voicing processes, to design digital systems and processes that empower workers and furnish the full benefits of a democratised workplace. In this thesis I describe an action research program in the form of two case studies in which I explore both the design space for digitalised employee voice, and the impact of two fully realised digital employee voice systems and processes. The key to my approach in both case studies is the notion of constructive discussion and understanding the conditions under which such discussion will thrive. The first case study involved primary research (interviews and workshops) and secondary research (literature review of employee voice) to establish a number of qualities for bottom-up constructive discussion: *Civility*, *Egalitarianism*, *Safety* and *Validity*. Based upon these qualities a number of design goals were formulated for a bottom-up digital employee voice system and process: *Assured Anonymity*, *Constructive Moderation*, *Adequate Slowness* and *Controlled Access*. The *OurVoice* system constitutes the outcome of the design process. The utility of *OurVoice* was evaluated in a department-wide deployment within the School of Computing, Newcastle University, UK, and the qualities required to embed and sustain digital employee voice were explored through a deployment with casual teaching staff in the Faculty of Information Technology, Monash University, Australia. Case Study 2 focused on the design of a digitalised consultation process that was led by an employer but driven by employees. The *OurStrategy* system and process was co-designed with the employees and managers of WorldFish, an international aquaculture research NGO, and was evaluated across six of their national offices: Myanmar, Bangladesh, Solomon Islands, India, Nigeria, and Zambia. The deployments allowed the identification of of qualities that play an important role in the successful embedding of employee voice processes within organisations, including the provision of progression assurance, clear signals as to bounded accountability of involved parties, and the importance of bias reflexivity. However, the most significant finding is probably the simplest, that is, that reflection on the design process, behaviour of participants, and outcomes of the deployments of both OurVoice and OurStrategy has demonstrated the utility of grounding the design of digital employee voice systems and processes in the creation of conditions for constructive workplace discussion.

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Chapter 1 Introduction

1.1 Overview

The discipline of Human-Computer Interaction (HCI) has for some time been exploring ways of facilitating people's participation in consultation processes utilising their knowledge and experience. This has ranged from consulting community members within civil society [134,180,287] and non-for-profit organisation's supporters and volunteers [20,195] to local governments reaching out to citizens as part of formal and informal consultation processes [200,221]. One area that would benefit greatly from participation and collaboration-focused research is the workplace. Indeed, studies of the manufacturing industry in the USA show that the 'growth in production value per worker played a substantial role in the last decade's change in manufacturing employment' [157,259], increasing the role of single employee and the knowledge held by them. A workplace concept that incorporates an employee's ability to participate in organisational consultation and decision-making is called 'employee voice'. Employee voice is a mechanism by which employees can engage in workplace discussions and participate in decision-making without fear of negative consequences.

The concept of employee voice has been articulated and explored differently across the various disciplines for which work, workers and employers are primary concerns. These disciplines include *Human Resource Management* (HRM) which studies "planning, implementation, and management of recruitment, as well as selection, training, career, and organisational development within an organisation" [255], *Industrial Relations* (IR) which more narrowly addresses "processes and outcomes involving employment relationships" and "employment relationships involving collective representation of employees in the form of a labour union or employee association" [120], and Organisational Behaviour (OB), "a discipline concerned with describing, understanding, predicting, and controlling human behaviour in an organisational environment" [311]. For example, OB considers employee voice from the perspective of how constructive organisational

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development can be achieved by supporting employees' contributions of knowledge and experience and challenging established management views [82,251,326]. In contrast, IR frames employee voice in terms of grievances (legitimate or otherwise) and the promotion of better working conditions through employee independence [96,126,342], focusing on collective participation in particular. IR assumes conflicting interests between employees and managers, often in relation to the promotion of workplace democracy [128,323]. This is closely related to the Scandinavian tradition of Participatory Design, which recognises the value of understanding participation and work democracy to development of knowledge and management of realistic expectations [31]. HRM has a broader understanding of employee voice and workforce participation, examining these in terms of the voicing of concerns, grievances and suggestions through direct and organisation-specific channels, and as such assumes a general alignment of employee and employer goals [233,342]. These disparities point to the complexity of employee voice. The complexity that needs to be appreciated in HCI-driven studies such as this, that in part aim to develop an understanding of employee voice through the design of digital processes that support it.

The participation of employees, in relation to employee voice, can be understood as a group process relying on collaboration and collective decision-making. The involvement of different organisational levels, delegation of voice, and process and means of representation have been extensively explored in relation to how employees can take control over decision-making and ideation processes, and even sharing the responsibility for potential outcomes [45,260,330,342]. As noted in Heller et al.'s *Organisational Participation: Myth and Reality* [156], there are multiple potential levels of formality in employee participation, ranging from mechanisms that structure processes or institutions (such as unions, works councils or ombudspersons) to informal arrangements that rely upon relationships within the workplace (between teams, between employee and line manager or supervisors and mentee) through which those being managed or mentored can provide feedback, share ideas and have significant input. Moreover, timing and duration of participation can be understood as either a continuous process or a result-oriented endeavour with a clear set of objectives.

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Employee voice can be realised through one or more of multiple different channels of communication within the organisation and through different voicing processes within the workplace [15]. Direct communication is often a bottom-up process that involves upward problem-solving initiated by employers and often operationalised in the form of individually focused face-to-face interactions between colleagues, employees, and line managers. These interactions can range from informal verbal exchanges to formalised oral or written expressions of concerns and suggestions. The responsibility for communication is often delegated, where employees are represented by a trade union or other employee association that plays a trusted role in engaging employers on behalf of employees, particularly in collective bargaining or consultations. These configurations raise different questions regarding the degree of facilitation, efficiency, power dynamics, influence and responsibility within the employing organisation, as well as the economic impact.

The overall character of a workplace has a significant effect on employees, particularly the extent to which it promotes a psychologically safe work environment. Trade unions have historically played an important role in this respect. Through 'safety in numbers' they can be both reactive, protecting individuals from unfair persecution and exploitation, but also proactive in negotiations with employers regarding the workplace environment [338]. However, in many countries such as the UK, increasingly stringent legislation (over the course of decades) aimed at restricting the ability of unions to take direct and indirect action has led to a significant decline of unionisation, and the emergence of non-unionised types of employee voice and engagement [216]. This correlated with the shift away from unionised representation between 1980 and 1998, which manifested through increased employee voice forms' diversity [42]. These included more direct and non-unionised methods of voicing (such as HR and manager-led meetings, internal surveys and one-on-one employee-manager chats) [179]. Employee participation became more personalised, and ways of voicing became more organisation-specific [26,233].

Previous research has explored how non-unionised forms of decision-making can have a higher impact on consultation processes [181,348]. In part, this is due

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to their greater flexibility, depending on the level of formalisation and the degree to which they are integrated with the (typically) hierarchical structure of the organisation [191,227]. Formal arrangements are well-defined recurrent procedures such as annual reviews and employee surveys, whereas informal arrangements include ad hoc unstructured interactions between employees, line managers and supervisors [190,191,227]. Each arrangement has limitations, that depending on the context of the workplace environment, can restrict its effectiveness [211,294]. This includes employee perceptions of the risk of using these channels [38,251]. Perceptions of safety in relation to voicing concerns (e.g. with respect to repercussions or negative reprisals) [193] is intimately connected to the concept of psychological safety and workplace silence [106], that is, the ways in which employee voice is encouraged and validated. This points to the need to explore personal and organisational inhibitors and facilitators of employee voice. Developing an understanding of facilitators and inhibitors was the starting point of my research, and this informed the design of *OurVoice*, the artefact at the centre of the first case study.

Related fields of research within computer science that study the design and use of technology in collaborative settings (from multi-user interfaces to global social media platforms) are Computer-Supported Cooperative Work (CSCW) and Group Support Systems (GSS). For examples, some research in CSCW has addressed issues of work and employee participation in decision-making through the facilitation of *coordinated action* [147,148,201]. By emphasising the importance of meaningful collaboration around work-related tasks and coordination of efforts [148], CSCW focuses on horizontal (peer-to-peer) communication between employees. GSS concerns generally relate to computer-supported collaboration through more nuanced aspects of its continuation and effect on relationship dynamics in the group, and emphasises aspects of computer-mediated collaboration such as privacy preservation and pace of work [3]. Thus, GSS more directly encompasses opportunities for employee voice support through its concern about the provision of digital tools for task-related collaborations [55,332,347].

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Within the context of a growing literature on employee voice, this thesis investigates how technology can support participation in the decision-making and consultation process within the organisation by designing digital tools that enable employees to be actively involved in decision-making. That is, the digital facilitation of employee voice within organisations, the mitigation of workplace barriers [98,193], and supporting voice sustainability and effectiveness within the organisation. The thesis explores employee voice support and embedment within organisational process in the complex and authentic settings of Higher Education Institutes (the UK and Australia) and Non-Governmental organisations (South Asia and Africa). It achieves this through two case studies conducted between 2017 and 2021, one set in the precarious employment environment of universities and one set in the context of an organisation-wide strategy development process within a not-for-profit international research organisation. In Case Study 1, literature analysis and qualitative research led to the conceptualisation of organisational inhibitors and facilitators. When combined with collaborative employee empowerment, these crystallised into a set of design goals for digital tools that facilitate informal and direct employee voice. These design goals later informed the development and deployment of our first system (at Newcastle University, UK), OurVoice, an anonymous digital platform for safe and secure workplace discussions. OurVoice was then used in a further deployment to explore how to embed employee voice within a organisation (at Monash University, Australia). The outcomes of Case Study 1 informed the formulation of Case Study 2, which explored mechanisms for leveraging employee voice through stakeholder engagement within a formal, employer-led (but employee-driven) future strategy consultation and development process. Findings from each of these case studies contribute to new understandings of how decision-making and consultation processes in organisations can be facilitated and enhanced.

1.2 Research Questions

This thesis is primarily concerned with how digital technology can support decision-making and consultation processes within the workplace by facilitating employee voice and mitigating employee engagement barriers.

1.2.1 Research Question 1 (RQ1)

RQ1. *How can digital tools and anonymity support the creation and facilitation of employee voice?*

This research question requires the conceptualisation of characteristics of constructive discourse that will form the basis for design insights for a digital system that foster a safe and fear-free digital space for employee voice.

1.2.1.1 *Objectives Related to RQ1:*

- Identify and conceptualise discourse characteristics and qualities for constructive discussion and support of employee voice.
- Establish design goals and properties for digital employee voice systems and design systems for employee voice facilitation and staff participation in an organisation's decision-making processes.
- Implement and evaluate systems to support reflection on design insights and characteristics of digital employee voice.

1.2.2 Research Question 2 (RQ2)

RQ2. *How can we design an Employee Voice Process (EVP) to provide the impact of employee participation in organisational decision-making and sustain engagement with the EVP within an organisation?*

1.2.2.1 *Objectives Related to RQ2:*

- Develop an understanding of how the impact of employee voice is mediated by organisational context.
- Design systems and processes for the facilitation of employee voice within different, but representative, organisational contexts.
- Explore sustainability of the EVP through the deployment and evaluation of employees voice systems and processes within different, but representative, organisational contexts.

1.3 Research Approach and Methodology

This research aims to explore how we can utilise digital tools and, where possible, existing digital infrastructures within organisations, to facilitate the voice of

employees. The approach involves configuring factors such as the level of anonymity, moderation and pace control for sustaining the discussion, while also considering how to maximise the impact of such voicing processes in organisational decision-making. The real-world nature of the research, and the need to design system and processes that engage the stakeholders (both the employees and employers, and in Case Study 2 a wider set of stakeholders) led me to employ an iterative approach that utilises agile methods that are maximally responsive to the contexts in which I was working.

1.3.1 Research Approach

This thesis has adopted a case study approach to explore how the employee and stakeholder voice can be facilitated through digital systems based on both initial design considerations and changes based on feedback collected from the users. By exploring the affordances of deployed digital systems and processes, and the nature of their appropriation (or not), I examined the impact on (workplace) community and stakeholders' engagement, and eventually, assessed whether a more trusted and open workplace was enabled.

The program of research was conducted as two separate case studies, with two different configurations of employee voice system and process, and cycles of planning-acting-reflecting conducted within each. Case Study 1 adopted a bottom-up and informal approach to the voicing of concerns by employees (**Chapter 4**, **Chapter 5**, **Chapter 6**) whereas Case Study 2 was involved the design of top-down, structured, and formal employer-led (but employee-driven) consultation process (**Chapter 7**, **Chapter 8**). The settings for the case studies were selected in an attempt to cover a sider cross-section of contexts in terms of contractual nature of the employment of staff involved and their geographic distribution within the organisation – i.e. casual and local (Case Study 1) and permanent and distributed (Case Study 2). While two case studies alone is far from adequate, in terms of representing the many different instances of organisations that exist on these two axes alone, this does afford some opportunity to examine the influence of such contextual variables on engagement and other outcomes. The methodology employed is mixed, empirical and application-focused, using qualitative methods

on the form of content, interviews and workshop analysis, and quantitative data collection and analysis (e.g. system logs, access logs, etc.) to support or verify the qualitative findings.

To address the research questions I took an iterative research approach to research study planning. Each case study started with a loosely defined design brief that was iteratively refined, and the scope narrowed, based on the data collection, the outcomes, and feedback elicited during the design, deployment and evaluation steps of each iteration (cycle). This approach is best characterised as a combination of an Action Research (AR) approach, which originated within social science [11] and an iterative approach, which is mostly associated with software development [198] (and can be seen as a precursor of agile methods), and corresponds to digital technology version of Altrichter's and Kemmis's model for AR [5].

AR is an iterative and collaborative research method that deconstructs the problem-solving process into cycles that focus on producing actions and tackling specific issues (within the problem) in a collaborative manner [35]. In a more general sense, as Bradbury describes, AR incorporates an intent to support individuals and communities: 'action research is a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview'. AR was first defined by Lewin [208] in the mid-20th century as a way to conduct social psychology studies. Of particular note for my topic of concern is the fact that the in the foundational phases of AR, Lewin and his students conducted experimental tests in factory and neighbourhood settings to show its positive impact on productivity within organisations and the value of democratic participation, which was not common at the time. Indeed, the initial focus of AR was to develop social relationships within and between groups to sustain communication and cooperation. Lewin concluded that a new leadership approach was required to achieve such workplace and community environments; environments that would be very different from those that people were accustomed to at the time. Thus, AR was established as a means to conduct systematic inquiries with participants as to the effectiveness of democratic participation. Indeed, it is remarkable to see how closely the goals and

activities associated with the emergence of AR align with the concept of employee voice which similarly strives to leverage employees' (participants') knowledge and enable their participation in workplace decision-making ('workplace democracy').

1.3.2 Methodology

AR has since been used in most other disciplines and applied to a wide range of research questions, including design, social science, medicine, engineering, and, of course, computer science. Within computer science it is most apparent with the human-centred sub-disciplines, and within HCI [153] has became one of the common methods [287]. Here the application of AR marked a shift in the relationship between HCI researchers and the subjects of their research, with a new framing of research as the collaborative exploration of a research question in the service of making an impact and producing positive change for participants in relation to a real world problem [35].

AR is an iterative approach that consists of series of cycles [5] - each cycle is (usually although not exclusively) divided into three main stages (see Figure 1) [353].:

- *Plan:* planning and designing the activities involving the accumulation of available information through continuous engagement with the available sources of knowledge (literature, participants, etc.).
- *Act (Observe):* actioning and observing the outcomes, involving the implementation and facilitation of deployment of an intervention or technological solution in a specific context while continuously observing and producing knowledge through the act.
- *Reflect:* analysing and reflecting on participants' inputs and feedback or other types of activity outcomes. This stage involves analysing and evaluating the conduct of the intervention and the implementation of previous cycles. If needed, in subsequent cycles the reflection stage a completed cycle acts as the basis for the planning stage of the next cycle.

When it comes to technological interventions, AR also allows us to evaluate them from the perspective of the actual users given the collaborative nature of the endeavour. This places us very close to the Iterative Software Development

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approach from Software Engineering [198] and shares many aspect of the Plan-Do-Study-Act philosophy of software development [77]. However, here the 'end-user' not only means the consumer or a customer of the technology or intervention (as in Software Development, but rather, the members of the community with whom we are developing an intervention, and who have expert knowledge of the domain and context.
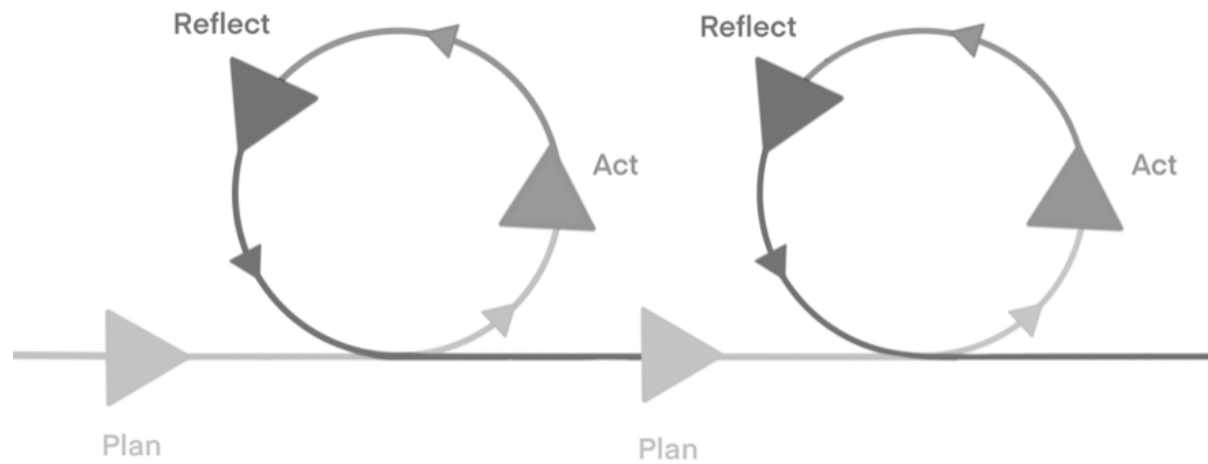
Figure 1. Action Research iterative cycles (courtesy of Stuart Nicholson).

In this model, Hayes et. al explicitly defined the goal of Action Research in HCI as creating sustainable change through interventions, allowing communities to take full control of interventions, associated processes and new technologies [153]. AR also has much in common with the cooperative and democratic design orientation's Participatory Design (PD) discussed in Section 2.5.2'. The collaborative essence of AR and its open-ended iterative nature of knowledge production make it very suitable for the employee voice context which aspires to cooperation and participation of workplace community members, and frames employees as the experts on the work environment whose knowledge is untapped. As outlined in the subsection 'Employee Voice', this adds a new facet to the applicability of AR to the organisational context. Indeed, Coghlan and Shani have previously described AR in organisational contexts as an inquiry process by which researchers integrate their knowledge with the organisational context to solve existing organisational problems. At the same time, this leads to both the development of competencies in the members of the organisation (practical value of the research approach) and 'scientific knowledge' (i.e. theoretical value) [63].

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However, it is worth noting that solutions and knowledge developed through an AR process tend to focus more on 'applicability' to real problems and 'transferability' to similar contexts [5,153], and less attention is played to the generalisability of insights.

1.4 Thesis Structure

Figure 2 illustrates the structure of the thesis discussed below.

Overview	Chapter 1: Introduction
Background	Chapter 2: Employee Voice
Background	Chapter 3: Digital Facilitation of the Voice and Collaboration
Architecture	Chapter 4: Case Study 1 (Cycle 1) Designing Bottom-up Employee Voice
Conduct	Chapter 5: Case Study 1 (Cycle 2): Facilitating Direct Bottom Employee Voice
Conduct	Chapter 6: Case Study 1 (Cycle 3): Employee Voice Process, Embedding and Continuity
Architecture	Chapter 7: Case Study 2 (Cycle 1): Motivation and Design
Conduct	Chapter 8: Case Study 2 (Cycles 1, 2 and 3): Deployment, Findings and Reflection
Reflect	Chapter 9: Conclusion

Figure 2. Thesis structure.

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Chapter 2 (Employee Voice) reviews the existing literature on research on and practice around employee voice, and how employee voice is conceptualised and addressed in different subfields of business studies, design and computer science, including: Human Resource Management, Organisational Behaviour, Industrial Relations, Participatory Design and Computer Supported Cooperative Work.

Chapter 3 (Digital Facilitation of Voice & Collaboration) considers the array of digital tools and workplace systems for facilitation of communication and collaboration through the lens of adaptation and usage. The chapter also reflects on the research in Group Support Systems, Enterprise Social Network adaptation and Online Community practices, specifically in relation to online discussion support, anonymity, and moderation.

Chapter 4 (Case Study 1: Designing Bottom-up Employee Voice) outlines the design space and relevant facets for collaborative technology can support employee voice. Employee voice is explored through interviews about employee voice practices, its facilitation and participants' experiences of online discussions. In combination with a synthesis of understandings from the existing literature (**Chapter 2** and **Chapter 3**) I develop a set of characteristics for a digital tool to support bottom-up employee voice, which constitutes the outcome of the first cycle of the AR process.

Chapter 5 (Case Study 1: Facilitating Direct Bottom Employee Voice) is provides and account of the second cycle of the AR process (for Case Study 1) in which I operationalise the characteristics of employee voice support by identifying a number of qualities of *constructive discussion* – Civility, Egalitarianism, Safety and Validity – and a set of design goals – *Assured Anonymity, Constructive Moderation, Adequate Slowness* and *Controlled Access*. Through a reflection on a real-world deployment the chapter elaborates on how OurVoice helped establish a trusted digital space for voice and peer-to-peer employee communication.

Chapter 6 (Case Study 1: Employee Voice Process, Embedding & Continuity) is an account of the third AR cycle of Case Study 1 in which I explore the use of in *OurVoice* in an end-to-end Employee Voice Process (EVP). Here I particularly focused on how to enable sustained and successful interaction between parties, and how to support continuation of the process. I also posit a number of key characteristics of a successfully embedded EVP: *progression assurance*, *bias reflexivity* and *bounded accountability*.

Chapter 7 (Case Study 2: Motivation & Design) establishes the context and design motivation for the strategy consultation process (Case Study 2), Here, in collaboration with WorldFish management I seek to sustain and enhance employee voice through employee facilitation of stakeholder voice in a formal and direct process. this case study further elaborates the employee voice concept by focusing on a top-down employer-led approach. The outcome of the first AR cycle of Case Study 2 is the *OurStrategy* digitalised strategy consultation process (*Design*, *Conduct*, *Tag* and *Analysis*).

Chapter 8 (Case Study 2: Deployment, Findings and Reflection) begins with an account of the design activities, including consultations with managers and employees. This is followed by logical and technical overview of the system supporting the *OurStrategy* process, and an account of the pilot deployment and evaluation of the *OurStrategy* across three countries, followed by the full deployment across six countries. The chapter further elaborates on design decision validation and environment-driven changes, finishing with country-specific and overarching findings of the process.

Chapter 9 (Conclusion) reflects on the research endeavour as a whole, both by revisiting the research questions in the light of findings from both case studies, and initiating a discussion of provisional concepts concerning facilitation and enhancement of employee voice. In the traditional of all science and engineering theses, the chapter concludes with a presentation of the limitations of this research conducted, and prospects for future research.

Chapter 2 Employee Voice

2.1 Introduction

In **Chapter 1**, this thesis outlined the critical landmarks of my PhD study, including a summary of the different perspectives on workplace community collaboration and work issue resolution from industrial, organisational, social and psychological perspectives. Thus, **Chapter 1** highlights different approaches taken by researchers, practitioners, organisation managers and employees/unions to explore and tackle workplace-related issues for provisioning voice channels and engaging employees. The primary purpose of **Chapter 2** is to provide a more comprehensive and detailed picture of all relevant areas that frame the context for PhD study. The chapter begins the concept of employee voice, outlining how it has developed historically, demonstrating the different ways employee voice can be exercised through a representative (e.g., a union) and more direct mechanisms within an organisation. In doing so, **Chapter 2** highlights the importance of context awareness and balancing different approaches and channels. The employee engagement literature in Human Resource Management (HRM), Industrial Relations (IR) and other fields of business studies and social sciences are examined, particularly concerning how issues are voiced and tackled and what motivates and drives different actors to engage (or not) in employee voice activity. This discussion is followed by an exploration of the contextual workplace factors that either help to create psychological safety or determine employee silence within a workplace. By bringing organisational and contextual considerations together, **Chapter 2** defines the employee voice concept as it is utilised in this work and identifies the types of influencing mechanisms employees use to speak up. The chapter then proceeds to identify gaps in the literature and areas for exploration, ultimately focusing on the potential of using digital technologies to tackle identified issues and gaps while still adhering to the main requirements of the process to allow for successful employee voice mechanisms.

Employee voice as a concept is closely related to the ideas of the participation and influence over organisation operations and workplace environments by

employees. However, participation is a broad term with a substantial variety of interpretations that depend on the research approach of those who analyse it [45,91,301,323]. The differences originate from the variety of disciplinary perspectives ranging from IR, Political Science (PS), HRM, Human-Computer Interaction (HCI), Participatory Design (PD) and others. Each has a distinctive take on employee participation and their voicing of concerns, as well as other related concepts such as engagement, empowerment [315], involvement in decision-making and workplace or industry democracy [45,260,330,342]. Overall, the understanding of employee participation varies from thinking about it as a group process that relies on collaboration and collective decision-making, involvement of different levels of an organisation, to a focus on delegation and how employees take control over decision-making and ideation processes and share the responsibility for outcomes.

Subsection 2.2 below describes the foundation of employee participation and the concept of voice, their origins in unionisation and the shift towards non-union facilitated approaches. This background frames my discussion of the ways employees participate in decision-making using formal and informal channels and the corresponding concerns around these methods. Next, I articulate current, varied understandings of employee voice. Finally, I identify gaps informing an overview of technological approaches that can structure and support employee engagement in decision-making by demonstrating the opportunities and limitations of existing technological processes.

2.2 Voicing Concerns and Speaking Up in the Workplace

The growing demand for skilled workers invoked by rapid industrialisation and the scientific and technical revolution resulted in increasing labour requirements and productivity and effectiveness at the beginning of the twentieth century [28]. These changes highlighted the importance of the workplace environment and its role in employee well-being and the organisation's overall performance. This trend became more evident as increased demand for sophisticated workers' skills placed further stress on specific employees' knowledge for managing complex processes

and dealing with production issues and challenges [309]. These workplace demands and corresponding progress echo through two key development streams: *(i)* technological and procedural improvements in conducted work and *(ii)* organisational improvements for the betterment of the labour force. My thesis addresses the latter concept of organisational change by improving employees' workplace environment and engagement. I discuss the historical approaches of tackling this problem through the unionised and non-unionised voices.

2.2.1.1 *Unions as a Vehicle for Voicing*

The concept of active involvement of employees in organisational decision-making can be traced back to the growth of unionisation during the renaissance of trade unions at the end of the nineteenth century and the beginning of the twentieth century [278,283]. Here, a trade union [127] is understood to be an entity registered with the relevant state institution that is allowed to recruit members in a workplace and to act as the appropriate legal bargaining agent on their behalf [64,361]. The corresponding concept of employee voice as a provision for workers to act as a group to communicate with management to address potential issues and disparities was initially formulated and conceptualised as a means of 'changing an objectionable state of affairs' [159]. The concept highlights the role of unions and employee communities in protecting workers' rights and responding to workplace issues that they might face.

Indeed, historically trade unions were considered a primary channel for voicing concerns and suggestions. They helped to ensure the higher likelihood of being heard without the risk of negative repercussions in the form of penalties or dismissal [141,155]. Initially, the primary goal of unions was to support a fair workplace environment and negotiate improvements to the employment terms and conditions of their members [283]. The critical advantage of unions was their collective representation and ability to mobilise and represent their members at the collective, regional or national level, which allowed them to negotiate on equal ground with managers and owners of businesses for better wages and work environments [338]. Their activities are generally recognised as having a broader influence on industry sectors and an indirect effect on societies and economies

concerning the distribution of income and changes to the socio-economic dynamic [235]. Initial studies to support how employees can speak up usually meant a close connection between voice and engagement with the collective bodies, such as trade unions [126]. In addition, one of the initial advantages of unions is 'safety in numbers', the vital property of collective voice that ensures some level of protection for workers who speak up under union protection, unlike the individual employees who speak up. Grievance expression can result in lower performance ratings and subsequent limitation in opportunities for promotion [189,236,282], as shown later in this chapter, some studies show limited empirical support for the notion that unions can be protective [158].

Nevertheless, such collective representation does hold some value to employees as well as to employers. Freeman and Medoff [127] argue that these collaborative bodies have two facets:

- a monopolistic facet associated with their ability to negotiate wages and workplace improvements
- a collective facet related to their ability to unite members, representing the collective voice of all employees in the organisation.

This characterisation is closely related to Hirschman's understanding of employee voice within organisations as a means for operation and negotiation with management. Hence, Freeman and Medoff emphasise that the second facet of unionisation plays a vital role in promoting greater productivity and internal processes efficiency within the organisation. By 'having a collective voice in their dealings with management, employees are more likely to remain with the organisation than exit by quitting' [127]. The result is lower levels of labour turnover. Organisations that accommodate union representation are more resilient, more receptive to employees' needs and keener to invest in staff development. Working constructively with unions, in turn, contributes to a stable and well-educated workforce that is more likely to be productive and efficient in their work tasks and workplace collaboration, resulting in cost savings for the organisation per worker.

Literature review

There are issues with the ability of unions to represent and act on behalf of employees as a proxy. First, it is generally recognised that not all unions provide equally good representation or have the capacity to be a proxy of their members either within an organisation or at the industry level. As Green and Callus showed in their overview of the *Australian Workplace Industrial Relations Survey* conducted during the unionisation decline, most workplaces lacked the organisational infrastructure necessary for consultation and collective bargaining at the management level [49,142]. Callus identified that even though 85% of workplaces were unionised, only 40% of those had an active union presence that held membership meetings and negotiations with management. Later research, including [249] and statistics published by the Australian Bureau of Statistics (ABS) in 1998, shows that this figure dropped below 30%, further declining to less than 15% in 2020, as shown in Table 1 [360].

Table 1. Trade Union Membership in Australia from 1986 to 2020 (ABS, 2020).

Year	Full-time (%)	Part-time (%)	Total (%)
1986	47.3	40.2	45.6
1992	44.3	25.2	39.6
1998	31.2	20.2	28.1
2004	27.0	17.3	24.1
2010	21.5	15.1	19.5
2016	17.2	12.3	15.6
2018	16.0	11.8	14.6
2020	15.3	12.3	14.3

Second, trade unions are no longer the only facilitators of a collective voice for employees. The visible decline in unionisation in many developed countries over the past four decades raises the issue of how not to lose representation and the ability to speak up.

Machin and colleagues used a similar survey conducted in the United Kingdom [72] to show that the same trend was apparent within Britain's industrial sector [216]. According to their findings, the role of unions decreased and was deemed outdated 'in the modern labour market' due to increased competitive pressure from industry and employers, pointing to adverse shifts in

the economics of production and overall changes in the distribution and nature of the workforce and employee rights [216]. This claim was later supported by the most recent instance of the *Workplace Employment Relations Study* (WERS) as a trend occurring over the last three decades, described as 'the declining role of unions and the increasing individualisation of the employment relationship' [339].

The significant decline in unionisation in many industrial and developed economies raises the question of whether employees became limited in their ability to speak up. Using the same WERS 98 data from the UK, researchers have concluded that both the decline in unionism and an overall transformation of workplaces to a more individualistic and autonomous approach has led to a shift in voicing methods between 1980 and 1998 [42]. Bryson et al. (2002) demonstrate that both formal (structured and institutionalised) and indirect (representative) mechanisms of representation employees (such as trade unions) have been in steady decline. In contrast, more direct non-union mechanisms, such as meetings organised by human resources teams, internal surveys and meetings between employees and management, have increased. These methods include management-led activities, such as attitude surveys, problem-solving and project teams, and joint consultation within the organisation. Such mechanisms can be viewed as collective forms of employee voice that partially replaced the role of the trade unions during their decline [24,343]. The trend towards non-union mechanisms for workplace communication between employees and management is illustrated, particularly about organisational issues and conflict resolution [179]. Nevertheless, as official institutionalised entities, unions continue to play an essential role in broader cross-organisational and industry-wide issues that require a significant number of participants [159,331,349].

Given the ongoing reduction of the presence and influence of unions and the shift towards more personal and organisation-specific ways of voicing, the idea that trade unions are the best and only channels of representation of the collective voice is increasingly contested. Some authors propose that non-union voice mechanisms might be more reliable and suitable for workplace environments [26,233].

2.2.1.2 *Non-union Forms of Voicing*

Further research in this area has indicated more subtle differences between union-based and non-union-based voicing approaches. It has been argued that direct mechanisms for taking part in workplace discussions and influencing the decision-making process tend to have a higher influence on the consultation process in an organisation when compared to more indirect participation through union representatives [181,348]. Here it is suggested that unions lack the flexibility of smaller and more agile teams and committees, which may have less rigid agendas and be constituted when needed. Guest and Peccei (2001) analysed organisational performance indicators. They concluded that higher degrees of direct engagement of employees result in higher employee commitment towards the organisation. Positive effects on employees' psychological safety and employee-employer relationships are also recorded, especially when it comes to participation in policymaking [149].

Non-unionised forms of voicing within organisations can be broadly divided into arrangements to support speaking up according to their degrees of structure and formalisation. Marchington and Suter [227] considered such arrangements from an IR[1] point of view. They defined formal structures as mechanisms that use pre-defined, regular and concrete methods to facilitate expressing employees' views. In many cases, this assumes the form of strict, manager-led regulated procedures for collecting feedback. Formal approaches include activities that are well-defined and repeated. Examples include attitude and annual employee surveys, open-door mechanisms, 360-degree feedback, in-house conflict mediation procedures and ombudspersons. Problem-solving and project teams integrated into the organisation's operations work as joint consultation processes, incorporating employees as a part of the decision-making process [24,233].

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[1] Industrial Relations, or IR, is the multidisciplinary field in academia that studies the employment relationship through the lens of complex interrelations between employers and employees, labour/trade unions, employer organisations and the state.

Literature review

Some of the earliest analyses of the use of formal voicing mechanisms were undertaken within the Exit-Voice-Loyalty-Neglect model of Farrell [117] in response to Hirschman's concept of Exit-Voice-Loyalty [159]. These analyses focused on examining the formal grievance arrangements in organisations, analysing how they can be utilised as a provisioning mechanism for effective access to reporting. The intention was to determine the potential to reduce exit or adverse outcomes as responses to conflicts in the workplace environment [189]. This work also showed the close association between formal voicing channels and employees' perceptions of access to justice-oriented forms of voice. The provision of formal ways to start full investigations, or the ability to present evidence and challenge claims as part of a justice-oriented voice process provides a degree of assurance to an employee who has started a grievance process, legitimising the initiative and supporting positive perceptions of the procedure [25].

However, despite the widespread adoption of formal mechanisms for voicing within companies, employees' actual usage of these mechanisms is somewhat limited due to associated perceived fears and negative consequences [44,119,189]. There can be potential issues with using the formal form of voicing while influencing the employees' and organisation's motivation to utilise it. Ultimately this raises questions regarding the barriers that might interfere with the structural and formal ways of speaking up and casts a shadow on the ability to reach the goal of speaking up through the existing formal channels. For example, Klaas and Ward examined justice-oriented grievances in the context of formal voicing channels by investigating the motivation and readiness of employees to challenge line managers' decisions through someone in a more senior position or a trusted third party [191]. A primary conclusion was that a formal complaint or appeal can be seen as a violation of the organisational norms and goes against the idea of not 'airing of dirty laundry'. The act of challenging the authority of a specific line manager or senior figures in an organisation is potentially damaging not only to the line manager but also to employer-employee relationships [16]. Ultimately, an employee might hesitate to use the formal voice mechanisms due to perceived fear of consequences, although the manager can express the openness and willingness to hear the concerns. In other words, employee perceptions of

potential negative reactions from managers act as a deterrent to using formal voice channels within a non-unionised organisation. This means that in cases like this the degree to which employees are engaged in the formal mechanisms of voicing concerns eventually depends on the capacity of the particular employee to undergo and accept the potential adverse managerial responses.

There are additional constraints on the effectiveness and uptake of formal voice mechanisms, driven by both broader labour and industry factors, and managerial inconsistency and implementation errors. The direct nature of non-union voicing implies built-in countermeasures against ineffectiveness and limited flexibility of representative (unionised) voicing [141,181,348]. Formal channels might struggle to facilitate the necessary level of engagement and trust between all involved parties. Studies conducted into formal direct channels examine the managerial response to assess whether a voicing scheme exists and whether employees can access it, rather than understanding how well it works. They overlook the gap between the employer's intent and implementation or workers' perceptions of implementation [110,160,161,345].

For example, Marchington and Suter observe that pressures resulting from customer demands in supermarket franchises, restaurant chains or other hospitality sector businesses limit the ability to hold regular meetings and other scheduled activities due to the increased proportion of staff members required to deal with queries [227]. In some cases, only a small group of staff members attending formal meetings can decide on behalf of a whole cohort. Likewise, companies that employ many part-time, casualised or temporary staff members (e.g., universities, hospitals or aged-care institutions) find it challenging to assemble formal problem-solving groups, town hall meetings or even team briefings. They often resort to splitting such activities into multiple events or elements. The result is a lack of peer-to-peer communication characteristic of truly collaborative decision-making, along with the operational hurdle of managing several meetings to give all employees the ability to hear and provide feedback on a matter under discussion. These operational pressures are prevalent in industries that depend on customer or seasonal demand, such as hospitality, education, and health [23,70,280,330].

Literature review

In contrast to formal, regulated channels, more ad hoc and informal mechanisms afford to express concerns directly within a team or group of colleagues outside the structured process or organisational hierarchy [190,191]. Strauss emphasised the informal engagement of employees through unstructured day-to-day interactions between them and their line managers or supervisors. Through such mechanisms, employees can provide 'substantial' input into the decision-making process, allowing them to influence their work and workplace conditions [323]. Other researchers also stress the importance of informal dialogue to gain 'maximum value from employee-employer relationships' and provisioning the voicing channels due to its faster and more direct nature that allows more flexibility in reaction to workplace issues' [286].

Indeed, there is strong evidence for the importance of direct and more flexible communication in a workplace. Formal and well-structured channels cannot always provide due to their inherited complexity and bureaucratic nature [227,343]. From management's perspective, informal channels often appeal because of the prospect of directly explaining issues and addressing concerns. Likewise, informal channels offer the opportunity to receive similar direct feedback without the necessity of going through representative mediated steps or formal procedures. Moreover, informal channels still allow managers to control the process while retaining the ability to choose whether or not to account for employee ideas in their decision [227,344]. This 'direct feedback provision' advantage is one of the most vital aspects of informal channels that motivated me to explore them in the initial design stage (**Chapter 4**) before developing the concept and pilot of the digital platform for the facilitation of employee voice.

Not only do informal mechanisms provide management with the ability to develop closer workplace relationships with employees who voice their concerns, but they also allow managers to mitigate the potential for disruption through active employees who have chosen to speak up [14,211]. Several researchers have suggested that informal voicing channels are of particular utility in small to medium organisations. For example, in a multi-country analysis of formal mechanisms, Freeman, Boxall and Haynes concluded that organisations benefit from informal voicing mechanisms more than from regulated formal processes.

Literature review

They recommend that employees should be provided with 'informal voice opportunities' [126]. By contrast, larger organisations should provide the choice for employees to follow the informal route while offering multiple mechanisms for voicing to foster trust, job satisfaction, employee engagement and loyalty and commitment (see Figure 3).
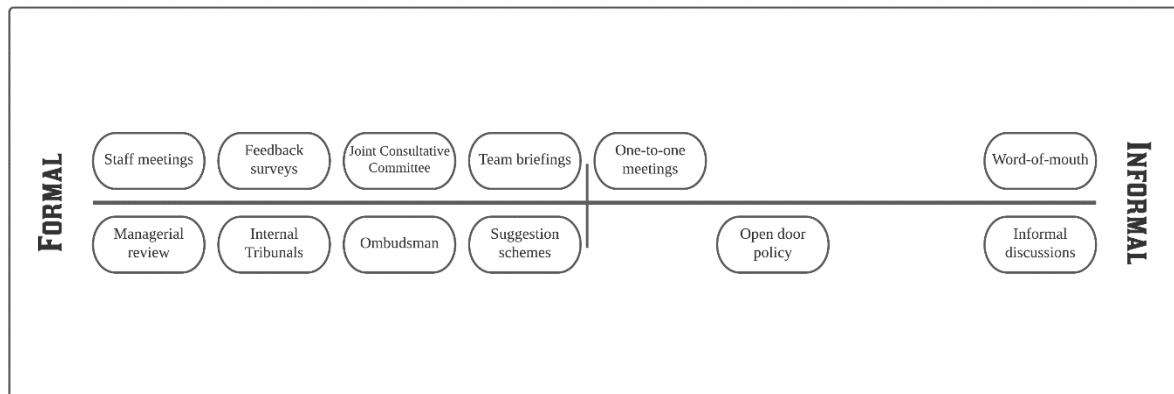
Figure 3. Formal to Informal Voice Channel Gradation.

Several studies that examine the differences between formal and informal mechanisms explore the notion of open management style approaches [227,246,343,348]. This management strategy focuses on creating a high-trust workplace environment and developing a direct relationship of mutual respect and trust. Mohr and Zoghi argued that direct informal relationships play a substantial role when formal voicing practices are ineffective or do not exist [246]. This assessment was also supported by Marchington and Suter in their study of the hospitality sector which showed how branch managers of the restaurant chain considered the informal mechanisms as critical for effective operations in an environment where teamwork and timely interaction with customers is essential [227].

2.2.1.3 *Formality and Informality: Striking a Balance*

The flexibility of informal voicing mechanisms leads to specific validity issues [110,204], resulting in a need to balance formal and informal voice channels within the organisation. Strauss stressed that 'a boss may meet her subordinates around a table to discuss work problems in pursuance of a written quality circle plan; this is formal participation. Or the individuals may gather informally to discuss the

same problems around a water cooler; this is informal participation' [156]. Indeed, studies have shown that employees prefer to use both voicing mechanisms [90], even though they generally favour informal speaking up, describing it as more positive and safe, with more significant potential to influence the decision-making process. Olson-Buchanan and Boswell showed that different staff members within the same company used formal and informal voices differently depending on the situation and attitude towards the problem or organisation. More loyal employees prefer informal methods [269]. Whereas informal channels were predominantly used for individual concerns, more collective or organisational issues were formalised [330,345]. Indeed, the underlying motivation behind formal channels for voicing is likely to be aimed towards perceived mistreatment and conflicts and focus more on achieving workplace fairness than conveying the desire for organisational processes improvement [271]. Conversely, voicing through the informal channels is usually motivated by a desire to be helpful and advance organisational processes [161,254,326].

The research discussed above demonstrates that if formal and informal channels exist in the same organisation, employees' concerns can be divided into two streams (see Figure 3). Informal channels hold the position of being direct, flexible, easier to engage within and favoured by employees in most cases [227,314]. Yet workplace environments must provide formal methods as a lack or absence of these could harm willingness to speak up and lead to *employee silence*; that is, employees withholding information from management that could improve the working practices for either individuals or the organisation [38,252]

Overall, the research into unionised and non-unionised formal and informal channels shows that different voicing methods can be beneficial to an organisation from different perspectives. The processes that contribute to an improvement in sharing concerns and suggestions result in better engagement of employees at a different level of the organisation's hierarchy while also demonstrating the importance of properly defining the scope for the voicing channel used. This problem points to the complexity of the speaking up challenge within an organisation and identifies space for frameworks and processes to support the voicing process in different contexts.

2.3 Psychological Safety and Employee Silence

In the workplace context, especially in the non-unionised setting, a critical requirement that determines the motivation for voicing concerns relates to whether an employee perceives themselves as safe from repercussions and negative reprisals that can follow from speaking up, strongly associated with the concept of *psychological safety*. This concept emphasises the extent to which voice is encouraged and validated within the workplace environment, whether people feel safe enough to take a personal risk to speak up, share concerns and ideas [48,86,106]. Some authors use the term *'perceived immunity'* or *'psychological immunity'* to emphasise an employee's level of concern regarding the potential negative managerial reaction [191]. This term is usually opposed to the concept of *psychological detachment.* Identified as one of the consequences of the lack of employee voice in an organisation, it negatively affects commitment and negatively influences the quality of work [46]. As Klaas and Ward concluded in their work on formal channels in non-unionised workplaces, perceived immunity significantly impacts employees' usage of formal channels and their ability to resist psychological pressure not to speak up.

Further, as Deter and Burris demonstrated, psychological safety can mediate and support the positive outcome of the associations between informal voicing and managerial openness [86] and encourage ethical leadership behaviour within organisations [14]. Indeed, a key idea behind psychological safety is creating a workplace environment that promotes an atmosphere of being able to speak up to managers and having an opportunity to share ideas and concerns openly. As Edmondson noted in her landmark book, 'it presents when colleagues and managers trust and respect each other and feel able - even obligated - to be candid' [106]. The sense of 'obligation' emphasises the overall psychological environment in which sharing issues and bringing up suggestions are welcomed and supported by management, whether it be informal channels in small groups, teams, and departments, or formal, involving HR, senior management, or trusted third parties.

Literature review

An absence of perceived safety at the workplace can lead to disengagement and silencing of voices, a sense of uncertainty in employees, and suppression of information sharing. Eventually, these factors result in withholding potentially valuable evidence or data from higher-ups or colleagues, limiting the potential for improving work practices, optimising processes, and developing the organisation. Lack of workplace safety can result from different perceived (internal and sometimes subjective) or organisational (objective and contextual) assumptions and doubts exacerbated by *fear*, a sense of *futility*, and *beliefs* and *presumptions.*

Futility. Suppose an employee believes that voicing their dissatisfaction and concerns, or even their suggestions for improvements, will not reach decision-makers and/or will fall on deaf ears (e.g., a manager's mind about a particular issue has been made up already). In that case, they will regard any process intended to foster voice as a pointless waste of time [99]. Moreover, this can stem from feeling mutual support and lack of awareness that other colleagues might have faced the same issues or support the same view. In such circumstances, employees think that speaking up is not only not going to improve things but also that their point of concern might not be a practical issue or concern to share. In turn, this can lead to a feeling of not being valued, a perceived lack of control over their immediate work environment and cognitive dissonance arising from the discrepancy between one's behaviour (not acting on issues) and one's beliefs [75].

Fear. Fear of job insecurity or limited progression in a career can act as a silencing measure that prevents employees from voicing [38,84]. For instance, Deter, Buris and Harrison researched the silence at a workplace. The Cornell National Social Survey (CNSS) identified that around 20% of participants reported that fear of repercussions had led them to suppress suggestions and not suggest a potential improvement [87]. Fears related to the perception that speaking up against the manager may result in a wrong impression (being labelled as a 'troublemaker') and lead to hostile treatment in the future. Some organisational theories might be explicit and well-articulated, rendering such threats more common than not [47,90]. However, employees often assume such threats based on their perception of the workplace environment and are somewhat hidden in workplace customs rather than being explicitly communicated [38,97].

Beliefs and Presumption. Being employees themselves, managers may have a set of assumptions about the reason behind workers voicing, mixed with their presumptions and beliefs on how they (as managers) should react and tackle such cases. Most of these beliefs correspond to employees' perceived challenge, including the notion of employees being self-interested and thereby non-trustworthy in their suggestions. This belief is often coupled with the perception that employees do not have the complete picture in their heads. Therefore, they are unable to make sound judgements regarding the issues and potential solutions. In some cases, these extend beyond presumptions of egocentric motives of employees to beliefs that employees cannot benefit the organisation [99,252]. This notion is tightly connected with another assumption that management knows best, especially in organisational matters [86]. Even though this idea has been noted previously and is not new [115,138], it stems from the inherently hierarchical nature of many organisations and the pervasive belief that managers (exclusively) must govern and control.

These factors (whether they exist in an organisation together or separately) can lead to a situation where voicing becomes an act of courage and self-sacrifice rather than a rational and assumed behaviour of employees. The experience of having something to say but being unable to do so due to (real or perceived) fears, beliefs or presumptions can be psychologically painful. Still, it is a common experience for many employees. Many employees report these experiences even when their higher-ups can listen and benefit from these voices [14,82,84,106]. The underlying problem in such situations is that the benefit is not always clear and is usually delayed, while the potential repercussions are tangible and immediate [89]. The delay can result in continued underestimation of voice capacity and advantages of outcomes while overestimating the disadvantages of speaking up. Such as *(i)* Higher-ups in an organisational hierarchy hear suggestions as personal criticisms (and thus, this exercise can be risky); *(ii)* only solid data, polished ideas, or complete solutions must be presented before it is safe to speak; *(iii)* perceived danger of bypassing the boss (either through formal or informal channels); and *(iv)* fear of embarrassing the boss(team/themselves) in public.

To add to the multidimensionality of these factors, it is worth mentioning that the role of psychological attachment and detachment has also been explored in the context of psychological safety and employee silence. Research has found that poor relationships with managers promote employees to consider quitting an organisation rather than voicing dissatisfaction and becoming silent. Here we mean the direct physical act of resignation (and leaving) and 'quitting' by holding back valuable information that may improve the organisation. Conversely, loyalty (*psychological attachment*) does not necessarily imply a willingness to voice. While some employees express their loyalty by voicing proposals for improvements, others may show it by not questioning the current status quo within the organisation [46].

In summary, a significant and growing body of evidence points to the importance of creating psychologically safe workplace environments in which employees will have a perception of immunity during the voicing process. Benefits for such organisations include increased employee retention and more robust financial performance [85].

2.4 The Employee Voice Concept

In practice, it is challenging to create and sustain a workplace environment that will encourage meaningful communication and collaboration between workers and managers. Rather than exclusively focusing on productivity and efficiency of work, workplaces should also make room for identifying and addressing workplace issues and concerns. Given existing communication methods, it is likely that those who voice issues will face repercussions, especially when issues are controversial [268]. This can be true even when a planned action is intended to benefit the organisation [48]. Inevitably, different individuals within an organisation have other vested interests and suggestions from one individual may well be opposed by another. Employees are also less likely to contribute to a group discussion where there is an imbalance in power between those who participate [167] and 'powerful' individuals are often found to make implicit threats concerning not 'rocking the boat'.

Moreover, speaking up is an investment of time and energy. When workers speak up, it is easy for managers to discount their contributions, leading to a vicious circle that has been discussed in Section 2.3 [99]. Therefore, providing a meaningful and respected structure for cooperative employee action is critical to ensure no 'hollow shell' or pretence at responding to concerns [344]. By ensuring that speaking out is not futile, there is a prospect of some form of change or improvement that will, in turn, encourage people to engage further.

The concept of '*employee voice'* characterises this idea. Employee voice was initially defined as 'providing workers as a group with a means of communicating with management' [127] but was later expanded to include participation in decision-making, engagement in workplace discussions and the ability to express opinion freely without fear of repercussions [2]. Employee voice is typically seen as an essential empowerment mechanism and a facilitator of bottom-up participatory planning within an organisation, allowing employees to influence an employer's actions [240]. The Advisory, Conciliation and Arbitration Services of Great Britain (ACAS) identified 'voice' as one of the seven 'layers of productivity' set out in the Building Productivity in the UK report. The Chair of ACAS, Sir Brendan Barber, called it the most vital part of productivity [2], which is congruent with Purcell's and Boxall's conclusion: employee voice as a term 'covers a whole variety of processes and structures which enable, and sometimes empower employees, directly and indirectly, to contribute to decision-making in the firm' [286].

The concept of employee voice can be considered a broader mechanism of providing employees with the opportunities to identify discontent, signal and modify the power of management (upstream), to allowing managers to leverage employee knowledge and expertise through direct or indirect feedback channels within the organisation (downstream). Overall, it embraces the involvement and participation of all parties. In this manuscript, I refer to employee voice as a broader concept that incorporates two core ideas. First, employee voice is a mechanism that aims to allow workplace communities to organise, self-adjust and preserve a positive and productive atmosphere, and cooperatively cope with arising issues and share concerns and suggestions. The concept emphasises the

collaborative nature of voicing (e.g., unions, project teams, initiative groups), allowing peer sharing and interaction. Second, employee voice is a mechanism that provides employees as individuals or groups with a means of communicating with management, having a saying in decision-making and engaging in workplace discussion by expressing opinions freely without fear of repercussions. The term emphasises providing the opportunity to offer input into how an organisation can address work-related issues and focus on the organisation's improvement and efficiency. Here, management must be receptive to employee ideas but still retains the right to manage and have the final say in the ways issues are addressed. Unlike purely upwards-driven voicing or notions of sharing ideas, this facet of employee voice focuses on the management-driven aspects. Thus, participation refers to playing a more significant part in the decision-making process by employees.

2.4.1.1 *Types of Voice*

Over many years, the concept of employee voice has become more refined, leading to the identification of four goals for an employee voice [12,91,99,260]:

- *Articulation of personal dissatisfaction with processes*. This goal refers to the idea of resolving issues between employees and management to prevent deterioration of relationships, employee silence, disengagement, and alienation.
- *Expression of collective decisions and thoughts*. This goal relates to counterbalancing the sources of management power and the ability to undertake a united action to address a problem or bargain with management on an issue. Additionally, it incorporates the idea that collective thinking can be more valuable and thorough than single-person decision-making. For example, organisations can benefit from employee voice by hearing multiple perspectives during decision-making [252], or identifying problems early so management can address them before it is too late [242].

- *Contribution towards relevant management decisions.* This goal relates to facilitating non-adversarial requests and suggestions for improvements in the workplace for better quality, efficiency, and productivity.

- *Displaying mutuality in employer-employee relationships.* This goal addresses trust and constructive collaboration among employees themselves and between the management and employees, thereby helping to achieve the viability and validity of the outcomes and processes in the eyes of all involved parties.

In support of these goals, Marchington et al identified collective and individualistic approaches as different dimensions of employee voice that characterise management goals and employee rights and responsibilities [228]. These are expressed through the lens of opinion exchange between individuals (informal and direct) and collective entities (employers, teams, unions) and can operate along both indirect and representative dimensions (see Figure 4).
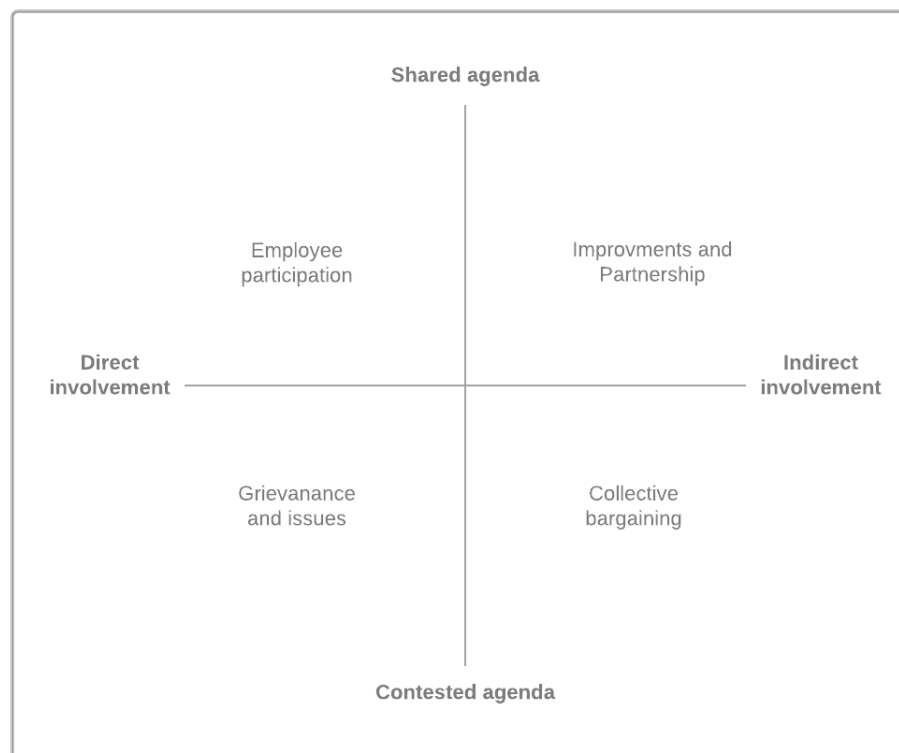
Figure 4. Employee Voice Dimensions according to Marchington, Wilkinson, Acker and Dandon.

Marchington et al. highlight that organisations have tendencies that shift between shared and contested agendas, much as they do between direct and indirect

involvement. Therefore, it is unlikely that they will engage in partnership and collective bargaining simultaneously. However, management's attitude towards employees and their voicing is the most decisive factor affecting the choice of approach to employee voice in these arrangements [86,90,352].

Mowbray, Wilkinson and Tse (2015) reviewed the research on employee voice and distinguished between *(i)* complaints about work-related issues, such as those that could lead to grievances and *(ii)* participation in decision-making processes by employees [256]. In this grouping, they regarded voicing as the upward problem-solving approach, a speaking up initiative that starts with the low-level employee and works up to management. However, they concluded that irrespective of an employee's motivation for voicing and the type of voice they decide to use, it is imperative for the correct mechanism and environment to be available for employee voice to accomplish its goal. Not only is it vital to provide a structure for employee voice, but management needs to be motivated to engage with the process, or it may be no more than a 'hollow shell' [344].

Dundon and Rollinson (2004) examined 18 case studies and identified two motives for management to establish voice systems in their organisations: *eliminate employee dissatisfaction and* capture suggestions to improve business performance [103]. They identify factors that influence employers to implement employee involvement schemes or voice initiatives rooted in the more fine-grained motivations for capturing voice. These factors are: *(i)* as an aspiration to 'educate' employees fully about aspects of the business and convince them of the 'logic' of management's actions; *(ii)* to provide safer and more controlled enhancement of employee contributions; *(iii)* handling conflict at work and promoting stability (providing a safety valve to express employees' views) and (iv) as a way to channel employee anxieties and misgivings without resorting to dispute procedures and industrial action [228].

Many contextual motivational factors influence employees' willingness to engage or not with the voicing procedure. Morrison (2011) proposed three types of voice based on the message delivered by 'employee voice behaviour': *(i) suggestion-focused voic*e, the delivery of ideas and suggestions via voice on potential

improvements and optimisation of the processes or department work within the organisation (improvement-oriented); *(ii) problem-focused voice*, employee communication of concerns regarding workplace incidents, practices or behaviours assumed by an employee to be potentially harmful for the organisation (stopping or preventing harm); and *(iii) opinion-focused voice*, communication of views on work-related matters that can be differentiated from those held by others (expressing disagreement) [250].

The first two voice types challenge the organisation's 'status quo' to benefit efficiency and workplace climate and procedures. Suggestion-focused concerns seek to identify new possibilities and enhancements, while problem-focused voice addresses the prevention of harm through stopping the existing malpractices and highlighting mistakes. However, the third type, opinion-focused voice, is meaningfully distinct in that it conveys the notion of dissent and expression of disagreement and opposition to the organisational procedures or policies *without* a clear statement of misconduct or errors [178].

Opinion-focused voice has been the topic of the research within workgroup contexts [206,326] and mentor-mentee communication [243]. Tangirala and Ramanujam have examined opinion-focused voice through the lens of personal control over the work environment, proposing that the more personal control an employee has, the more change-oriented and less challenging their voice is [326]. Similarly, Milliken et al. (2003) identified opinion-focused voices as the most comfortable for employees to exercise because they do not usually involve issues related to the performance or behaviour of their seniors and colleagues, and therefore, do not directly imply confrontation at a workplace. Employees' willingness to speak up depends directly on contextual workplace factors. Still, it is also influenced through the type of voicing, and its perceived 'danger' and value, thereby having a compound effect on employees' attitudes towards engagement in employee voice activity. For example, fear of repercussions resulting in self-protective behaviour can be less a factor for a suggestion-focused voice than a problem-focused or even opinion-focused voice, as it can be perceived as less personally risky. Including the contextual relevance in each case can affect employee engagement and managers' receptivity to it. Thereby, helpful

suggestions can be perceived more positively and easier to agree with, while raising an issue can be regarded as confrontation, depending on the workplace environment.

Work by Liang et al. (2012) on different voice types and their relation to motivational aspects identified that prohibited (problem-focused) and promotive (suggestion-focused) voices predict antecedents of psychological safety, constructive change obligation and perceived organisation-based self-esteem [210]. The authors developed and validated promotive and prohibitive voice measures, showing a positive linkage between voice types and psychological factors and emphasising the role of constructive changes obligation in promotive voice and psychological safety for prohibited voices. Conversely, Burris argues for challenging (speaking up with the intent to modify the status quo) and supportive (speaking up with the intent to defend the status quo) voices [47,228] by showing how the perception of employee's message content depends on the type of the voice. Their findings indicate that managers perceive those messages from the supportive voices as more agreeable and endorsement-worthy than employees who engage in challenging voices. An employee's performance feedback renders them either threatening or loyal, corresponding to previously discussed voicing concerns and fears, thereby showing the potential effect that voicing and types of voice can have on employees' well-being and productivity.

2.4.2 Employee Voice Wellbeing and Productivity

Employee involvement in decision-making and their representation in organisational change processes through the provision of the voice helps to take into account their interests and ideas (as the primary workforce of the organisation) and thereby has a positive effect on their productivity and overall organisational performance [8,185]. Thus, through the facilitation of change(s), the organisation may positively impact performance.

For example, in the ACAS report, employee voice was explicitly mentioned as one of the seven layers of productivity. Informed employees tend to contribute positively to decisions. They like to be listened to along with the fact that established voicing channels also cover other identified layers of productivity, such

as being a staple part of the effective conflict managing systems to reduce the likelihood of issues emerging while dealing with them at early stages. Additionally, if employees perceive the employee voice process as effective, it affects the layers of trust and fairness. The layer determines the interaction aspect for an employee who feels valued and correctly treated. An employer has information shared with them at the earliest stage and bridges the idea of positively affecting employees' well-being and psychological safety [110,161].

Previous research conducted in this area has shown the dependency of organisational performance and productivity on employees' approaches. It identifies different patterns for direct and indirect voicing. Doucouliagos conducted an extensive meta-review that addressed the effect of workers participation on productivity through direct voicing channels and found a largely positive effect on productivity that was sometimes small but rarely negative [100], identifying that worker ownership and participation in decision-making are positively associated with organisational performance.

Correspondingly, in the review of empirical studies, Cotton asserted that employee participation in decision-making takes distinct forms and varies in satisfaction and performance implications. He concludes that high employee influence drives a team's cohesion and commitment to those decisions (resulting from the employees' input). At the same time, direct voicing effectively improves employee satisfaction and performance when they (employees) have ownership over the decision-making process and significantly influence its outcome [68]. Additionally, it is shown to be most effective when employees participate through direct channels, providing them with a sense of permanence, regularity and considerable duration, focusing on work-related concerns and problems.

However, Kim, MacDuffie and Pil examined the influence of the team-based (direct collective) and representative (indirect, unionised) voices on work performance and concluded that neither of the voice mechanisms directly affect the employees' productivity when dealt with in isolation. Hence, the direct form of voicing contributes more to performance and productivity enhancement when used in combination with indirect (representative) voicing. Moreover, direct

mechanisms have a higher impact. Employees hold a greater chance of improving organisational performance, indicating that the employees' high involvement and increased influence are connected with effectiveness and higher quality of decisions taken while reducing the underutilisation of workers [185].

Another aspect tightly connected to the workplace environment is the employee's well-being, mental health and work-life balance. Research has shown that a safe and supportive workplace environment and a trusting relationship with an employee's line manager are associated with decreased work-life imbalance and reduced work-family struggle. This positive outcome for the quality of work and is deemed beneficial for employees' professional development [41,303,328]. For instance, Thomas concluded that if employees have a supportive supervisor and safe workplace environment, they are less likely to experience balancing work and family sides of life [328]. Similarly, O'Driscoll illustrated how employees with better support at their workplace experienced less psychological tension than co-workers with less support from their immediate supervisors or work-peers [267]. What aggregately leads to better life quality (personal and professional) decreases the negative impact of stress, work-life conflicts, and work overload.

Overall, research demonstrates that both workplace environment and relationship with both line manager/supervisor and team members/colleagues play an essential role in increasing or reduced work-family conflict and helping to maintain work-life balance. Thus, voicing concerns and sharing ideas with colleagues can help create and maintain positive well-being both inside the organisation and outside the work context. Morrison's work on employee silence endorses this view, showing how it could cause 'high levels of employee stress, dissatisfaction, and disengagement', which affects a person's productivity and organisational performance [251]. Morrison emphasises the establishment of voicing channels that facilitate sharing between peers (horizontal) and allow employees to raise issues or suggestions to management. From a different perspective, Baptiste highlighted the importance of support and development of trust from the management side, which helps to promote employee well-being and positively affects their productivity [19], demonstrating an interesting circular

connection between productivity and well-being with the prominent effect of employee voice.

Organisational productivity and good performance can be supported by employee voice and improve employee's well-being through organisational identification and attachment to performance [260,326]. Further, established employee voice channels within the organisation coupled with the ability to speak up, share suggestions, and challenge the existing status quo can prevent disengagement and decrease employees' feelings of dissatisfaction. In turn, this boosts satisfaction and mental health, resulting in higher performance and productivity [2,8,100].

2.5 Related Concepts

Employee voice and some of the other related concepts have been have emerged as topics of interest in a number of academic disciplines, ranging from organisational behaviour (OB), Industrial Relations (IR), Human Resource Management (HRM) and Participatory Design (PD), to more technology-focused subfields such as Group Support Systems (GSS) and Computer-Supported Cooperative Work (CSCW). In Section 2.4, I will discuss the different disciplinary perspectives on employee voice, engagement and participation in decision-making, and their perspectives and approaches to workplace environments and communication within groups or communities.

2.5.1 Organisational Behaviour, Industrial Relations & Human Resource Management

Although employee voice is a topic of interest in the fields of Human Resoure Management (HRM), Industrial Relations (IR) and Organisational Behaviour (OB), each discipline conceptualises the concept rather differently [342], . From the perspective of OB the goal of employee voice is to support constructive change within the organisation. This view sees voice as something that challenges management and the status quo and frames employees as contributors to an organisation's development and productivity [83,251,326]. OB also explores

employee voice from a more individualistic perspective, foregrounding what motivates an employee to voice a concern or suggestion, when to do that, and why.

A fundamental assumption is that employees care about issues, and that this is their main reason for wanting to speak up. Managers need to be receptive and open to hearing and valuing these these voices and their potential to be of benefit to the organisation. If not, they will encounter the consequences of not addressing important issues or considering different viewpoints. The communication of the openness of management to employee voice (e.g. through feedback) strongly determines employees' voice behaviour and engagement in the future, as determined by micro-level aspects that motivate or demotivate people from speaking up. Thus, OB consider voicing is a discretionary and proactive endeavour of employees which is in the main enacted by individuals [206,243]

The field of Industrial Relations (IR) frames voice as a means of employee independence, the expression of grievances and making requests for better working conditions [97,126,342]. As such, IR focuses primarily on collective voice through direct (non-unionised) or indirect (representative, unionised) mechanisms, with an emphasis on formal mechanisms that are embedded within organisational structures. The assumed context for voice is one of potentially conflicting interests between management and workers, and the role of employee voice plays in the protection of workers through forms of workplace democracy [128,323,348]. Employees are seen as wanting to have a say in decision-making processes and use their voice to do this; particularly when it comes to matters that have a direct material impact on their workplace environment, conditions, and the procedures that protect their interests. Established voice mechanisms are identified as essential to protect the rights of employees to speak up, and IR focuses on formal channels and institutions, facilitation mechanisms, such as trade unions, third-party arbitration and ombudspersons, and defined grievance procedures within the organisation.

Human Resource Management adopts a more comprehensive view of employee voice that incorporates the perspectives of both OB and IR. This broader notion of voice incorporates a wide range of mechanisms for voicing without a

exclusive focus on the means of employee representation, such as trade unions or ombudspersons [342]. HRM scholars therefore accept the two-fold nature of employee voice, both as (i) voicing complaints and grievances through representative devices, and (ii) having a say in decision-making processes through more direct mechanisms such as goal and issue-specific teams [233]. As such HRM considers that suggestions, opinions, and problem-focused voices can be expressed through any available channel.

More often, HRM researchers recognise employee voice as a part of employee engagement activity, as a way to introduce better work practices and tackle performance and workplace issues [8,161,226]. The focus, in such cases, is usually on 'direct' voicing mechanisms for improving organisational processes [193,342]. Knoll & Redman examined the relationship between employer-sponsored upward voice channels and employee silence, identifying that employees 'express ideas that aim at process improvements and innovation', while at the same time, they 'remain silent' regarding the issues that harm cooperation and challenge the workplace environment [193]. Fu et al. considered ways to implement 'HRM practices through high-performance work systems' focusing on employees' involvement to improve performance [130], concluding that internally broadcast newsletters, or internal enterprise social networks, through which employees can share their knowledge, boost overall organisational performance and help the development and diffusion of best practice.

Each of these disciplines has contributed to understanding of the employee voice concept. However, scholars from different disciplines can be wedded to the overall perspective of their schools [260,342]. OB research excludes IR studies from their discussion because of IR's primary focus on formal structures for collective, representative voice rather than informal and individualistic speaking up and voicing [250]. For similar reasons, IR excludes the informal and direct voicing mechanisms assuming that an employee and a manager naturally have opposite interests. In contrast, HRM assumes that voice mechanisms align employees and organisations through the shared goal of thriving through enhancing productivity, commitment and overall engagement for the betterment of the organisation [160]. HRM implicitly anticipates a larger emphasis on direct

voicing mechanisms where employees share their ideas to help the organisation achieve its goals. However, this can overlook a common IR issue: conflict-based cases of opposite employer-employee interests and power imbalance [260].

Overall, these disparities and the absence of a united view between the fields provide research space for HCI-driven studies that can develop a comprehensive understanding of the concept (employee voice) based on the different disciplines' dimensions and examine its facilitation addressing potential issues of silence fear.

2.5.2 Participatory Design

The Scandinavian research school in information systems and system development historically considers user participation of great importance to facilitate and improve working life democracy. Here, the involvement of members refers to their participation in activities during the design development phase. At the same time, the degree of involvement and the form it takes can vary, including representative or direct involvement, collaboration or consultation. The degree of influence denotes the power to make design decisions and the actual degree to which their input is considered during the decision-making process. The reasons for participation are usually stated as follows:

- developing and improving knowledge
- enabling participants(employees) to create realistic expectations about the process/change under design, and reducing resistance to expected changes, while providing a sense of ownership
- supporting workplace democracy by offering members of the organisation the ability to participate in decisions that will affect their workplace environment and work [31].

The notion of *workplace democracy*, coined in PD, has similar goals to that of employee voice. *Workplace democracy* involves providing employees with the right to influence their work environment through participation in decision-making processes [30]. This concept emphasises the members' (employees') right to retain a different opinion from those in power (management) to support contrasting positions and to build knowledge with the help of these differences while maintaining a set of opposite views. The concept adheres to the democratic value

of giving voice and providing a mechanism for involvement to those affected by a decision. For example, in Norway, industry-based research projects have given rise to legislative changes to empower workers, calling for increased worker engagement as a means to increase productivity and efficiency [112,329].

The Scandinavian Participatory Design school argues for balancing out workplace power dynamics and focusing on workers' interests to 'support the development of their resources towards democracy at work' [107]. Many Scandinavian research projects aim to increase working life democracy (or 'industrial democracy') to expand workers' influence and increase their voice in decision-making while striving to include social aspects. Thus, traditionally, much of the Scandinavian research based in PD has focused on increasing working life democracy within organisations.

The main argument supporting workplace democratisation is usually the idea that workplace democracy leads to increased quality of work, subsequently constituting *meaningful work*[2] and the notion of relational equality and the absence of hierarchical domination at a workplace. The former idea has been examined in earlier research. It has been shown to provide a positive correlation between one's quality of work, mental and physical health, supporting the growth of intellectual, moral, and professional capacities [33,334]. The latter notion describes the idea of egalitarianism[3] at a workplace, emphasising that employee-employer relationships must be characterised by equality [128], including the presence and quality of the horizontal (peer-to-peer) relationships. The concept of workplace democracy is closer to the idea of employee voice, with the distinction between them being in the angle from which these concepts characterise

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[2] Meaningful work is often described as a subjective concept that differs depending on the author and discipline perspective. However, generally, it is assumed to comprise of four core dimensions: 'self-integrity', 'unity with others', 'service to others' and 'expressing of a full potential' [33]. This suggests that meaningful work aligns with employee and organisational values and utilises workers' skills and talents, while supporting the feeling of belonging to something bigger and providing a sense of purpose of contributing to something bigger. This concept is usually tightly connected to one's meaning of life due to the amount of time spent working.

[3] Egalitarianism is characterised as a community in which members stand equal to each other, having the same rights and opportunities.

workplace relationships. Employee voice focuses on preserving a positive and productive atmosphere to eventually achieve organisational efficiency by allowing employees to participate in the decision-making processes within the organisation, cooperatively addressing issues that arise. In contrast, workplace democracy focuses on social aspects first, putting more emphasis on egalitarianism and non-hierarchical structure within the organisation.

2.5.3 Computer-Supported Cooperative Work

The CSCW field was formally established in 1984 and initially explored software development that supports small groups' collaborative work [147]. A body of work around the workplace relationship and employee participation in decision-making in the CSCW community focuses on facilitating *coordinated action* between employees [147,148,201,324]. This work seeks to empower employees to collaborate meaningfully in work-related tasks and coordinate efforts [148]. Also, the focus of CSCW is not restricted to those specific cases where the task of accomplishing responsibility has been assigned or assumed to be done by a closed, stable and relatively small group of workers.

The idea of group collaboration or teamwork implies distinct types of cooperative relationships and assumed shared responsibilities. Challenges are presented by a system design that facilitates cooperative work in larger groups with non-stable and unknown or unpredictable participants, especially regarding participants' conflicting goals (e.g., of employees, management and different departments). Lee and Paine's work investigated collaboration in the heterogeneous organisation, focusing on a more action-oriented process to facilitate bottom-up, employee-led participatory planning with formal and informal channels at play [201]. The result is a framework for coordinated actions: the Model of Coordinated Actions (MoCa) that is of particular interest for my PhD study. The MoCa is a framework for describing complex collaborative situations and environments based on long-standing CSCW models [172], but with three additional dimensions to address contemporary workplace issues.

The original taxonomy suggested by Johansen was initially conceived as a tool to help people in their collaborative work: however, since it was introduced, it

was supplemented and broadened, eventually evolving into a framework that implicitly describes work itself [7,17]. In this taxonomy, elements of work were considered asynchronous or synchronous and local or distributed. Synchronous is the computer-aided interactions happening in real-time (meetings, calls). In contrast, asynchronous involves delays in response and communication (emails, chat). MoCa used this distinction as a base and proposed seven dimensions that contribute to the design of effective coordinated action systems: synchronicity, physical distribution, scale, number of communities of practice, nascence, planned permanence, and turnover [201].

- *Dimension 1: Synchronicity*. This dimension derives from early CSCW work on groupware that could support synchronous communication in teams [172]. Subsequent work has recognised that coordinated action takes place across a dimension of both synchronous and asynchronous interaction.

- *Dimension 2: Physical Distribution*. Physical distribution refers to whether the coordinated action occurs in the exact location or across different locations.

- *Dimension 3: Scale*. The principles of scale indicate that coordinated action becomes more complex when there are more collaborators on the system.

- *Dimension 4: Number of Communities of Practice (NCop)*. Communities of practice in this framework refer to the multidisciplinary nature of the organisations, allowing for the inclusion of teams whose expertise may vary drastically.

- *Dimension 5: Nascence*. Nascence refers to a dimension anchored by established and novel ways of coordination.

- *Dimension 6: Planned Permanence*. This dimension focuses on how long the cooperation is designed to last.

- *Dimension 7: Turnover*. Turnover in this framework refers to the stability of the participant makeup and how changeable it is throughout the cooperation.

These dimensions will be described in greater detail in **Chapter 4**, as some elements have contributed to the initial framework design for employee voice developed as part of my PhD study and the corresponding anonymous digital platform.

Ingrained fears and potential inhibitors of employee voice and speaking up all present complexity within a workplace. One of the main research topics in CSCW is the understanding and implementation of computer systems and infrastructure. Such systems can help diminish inherited complications of cooperative, interdependent activities(work) and their coordination. The model of coordinated actions through the computer-supported channels lends itself perfectly as a task of employee voice facilitation [1,110,201]. Employee actions captured digitally bring a whole new dimension of properties and concepts that can help maintain the speaking up process (with anonymity, controlled pace, distribution, etc.) and, if properly captured and supported, bring benefits for employers and employees alike. Employee action can lead to more effective collective decision-making [252] while helping to detect issues and potential problems within the organisation at early stages and lead to a more straightforward resolution [103,110]. For employees, the collaborative nature of employee action can enhance work satisfaction [84,272], workplace interconnections [237], improve mental health[14,151,258], and nurture the feeling of being valued within the workplace [110], that in turn can improve employee retention.

CSCW has dealt with different complex forms of collaborative work and organisation types. The 'work' refers to a task or project requiring people's collaboration and concentration to achieve (finish), specifically, through the utilisation of the articulation work concept that originated in Sociology [322], and was later adapted and developed further for the CSCW context [135,304]. The meaning and primary focus of articulated work ensure that all resources and actors needed to accomplish the task (e.g., the facilitating employee voice in the organisation) are there and functioning (accomplishing their part of work) when required. Another key concept that directly affects the quality of the collaboration and is influenced by the temporal and complex nature of the work (projects) is the

notion of the 'common field of work'. Schmidt and Simone noted that the common field of work is the active site for a collaborative, coordinated work characterised by work interdependence of multiple actors affected by their activity. Thus, the actors influence their work context (field of work) and simultaneously affect the field of work of others. Interaction and influence are achieved by changing the work of all involved actors [304]. The CSCW discipline considers an interaction through the common field of work as the distinguishing characteristic of cooperative work. Employee voice is regarded as a necessary basis for facilitating cooperation: between employees (i.e., horizontally): to deal with and resolve issues, and between employees and employers (upward), to support and develop decision-making and address concerns within the organisation.

2.6 Conclusion

Chapter 2 drew a detailed picture of the research areas that frame the context for my PhD study. It discussed concept of employee voice and demonstrated the different ways employee voice can be exercised through representative (e.g., a union) and direct mechanisms (e.g., annual feedback, performance reviews) within an organisation. This chapter highlighted the importance of context awareness and use of communication channels for speaking up. Previous research in HRM, IR, OB, CSCW, and other fields of business studies and social sciences helped identify issues around the employee voice support how different actors are motivated to engage or disengage in employee voice activity. That led to the discussion of the concepts of psychological safety and employee silence within a workplace. The focus on organisational and contextual considerations helped identify the types of influencing mechanisms employees use to speak up. This ultimately led to the realisation of research gaps and areas for exploration. Such as the preservation of workplace safety and diversity of employees' voices through digital technologies that tackle negative consequences of speaking up and supporting employee engagement; while still adhering to the main requirements of the process to allow for successful employee voice mechanisms.

Chapter 3 Digital Facilitation of the Employee Voice and Collaboration

3.1 Introduction

Chapter 2 described the core disciplinary areas in which this thesis is situated, emphasising the importance of employee engagement, facilitating speaking up and discussing the commonalities and differences between various approaches (formal, informal, direct and representative) within the different disciplines. The primary focus of **Chapter 3** is to explore and depict methodologies for digital facilitation of voicing and collaboration within an organisation and within wider online communities. **Chapter 3** identifies the methods used, and their limitations, to inform the approach further and design considerations for the research case studies and system developed for this study.

If implemented correctly, employees' coordinated actions, voice and staff engagement introduce substantial benefits to the organisation (outlined in **Chapter 2**) [110,113]. Thus, it is no surprise that digital tools exist to support such activities. As mentioned in **Chapter 2**, several reasons make 'digitalising' employee voice a sensible idea, including *(i)* the overall shift from representative voice to more informal and direct; *(ii)* rising autonomy of each employee when it comes to working tasks; *(iii)* increasing complexity of tasks accomplished *(iv)* the trend of shifting towards distributed and remote work and *(v)* increased relying on digital technology in the work and life alongside the pervasive nature of that creates the potential for its adaptation and acceptance.

Although digital technology streamlines communication and helps address some of the concerns regarding time and availability issues, it changes the means of communication. It implies a new set of common concerns for online communication, even though it introduces asynchronicity that helps deal with the 'handful group of people' outlined in **Chapter 2**. This section outlines the main approaches to conducting and supporting communication and decision-making processes in the digital space, outlining the main issues and pitfalls of online

communication in general and concerning employee voice and the workplace environment in particular. This helps to demonstrate how to mitigate these issues and informs the overall design of the PhD research.

3.2 Group Support Systems

Group support systems (GSS) were recognised as a separate field of research at the end of the 1980s and focused on using information technology to support meetings and increase effectiveness. The field provides technological advantages of anonymity and privacy preservation, speed and simultaneousness, structuring, and measurability through digital models and frameworks [3]. The field has benefited from substantial growth due to the overall development of information technologies and theories since the field's inception, with development specifically prominent in decision-making and idea generation, which helps to reduce loss of time and increase engagement and information sharing [244,290].

Over time, GSS has incorporated a more nuanced aspect of the collaboration and continuation aspects of the work, specifically how it affects relationships in a group. Thus, Chidambaram has examined the use of GSS, group attitude and relationship development that has improved with increased length of system usage time [53,54]. Employee voice, as an established process, implies staff members' involvement in decision-making and includes a certain degree of complexity. At the same time, the GSS discipline focuses on finding tactics for sustainably handling complex issues. There is a clear overlap between employee voice and GSS that can better tackle employee voice issues [183]. Indeed, in line with the notion of providing a trustworthy and safe environment for voicing concerns, the issues examined in GSS (particularly collaboration and anonymity of members) supplement the digitalised approach for facilitating employee voice [55,65,332,347]. Chidambaram et al.'s work on GSS came up with the idea that, in the current context of ubiquitous computing and further distribution of modern technologies, the idea of group or teamwork could be broadened to the 'collective actions'. This method is more closely aligned to the CSCW understanding of collaborative work [55] and to the larger, distributed digital platforms that support collective actions and provide each member with the ability to contribute

safely. This idea supports the notion of the more fluid membership of non-unionised workplace collective from PD. It adheres to the idea of CSCW's coordinated actions by a larger group of participants. Certainly, technological development ushered in the transition to the faster, more flexible, and more ubiquitous online means for establishing communication, such as digital tools/platforms, especially in the current era of an increasingly remote and distributed workforce [121,274]. In this thesis, I follow Reuver's notion of the digital platform as a 'sociotechnical assembly of the technical elements (software and hardware) and associated organisational processes and standards' [292]. In different contexts of more temporal and fluid membership in groups (e.g., issue, task or project-specific), collective actions drifted away from the strictly structuring effect of organisational hierarchy and direct interpersonal awareness towards the freedom and safety of online conversation.

An additional relevant concept examined by the GSS is anonymity and its influence on decision-making processes within groups. This concept renders itself of particular relevance for my PhD research in the light of all identified inhibitors and issues that come into play when we consider the implementation of employee voice within the organisation and associated fears and negative outcomes. In GSS, anonymity is examined as an added property and supplementary aspect of the digital platform that defined the extent to which the contribution of each group member can be (non)identifiable to others [332]. For instance, Connolly et al. examined the effect of anonymity in the GSS and its effect on idea generation. They concluded that a positive effect was generated: more ideas were generated with the critical tone of communication in the group, with increased satisfaction and perceived efficiency with the supportive tone [65].

Researchers draw on the model of balanced forces that affects people's communication and the quality of idea generation. They identify that group effectiveness in idea generation and creativity depends on the 'enhancing forces' of encouragement, reward, and stimulation, while 'stifling' forces such as fear of embarrassment, hostile evaluation, conformity pressures and production blocking can impede effectiveness. These characteristics bring GSS closer to the decision-making process within the employee voice concept. Indeed, employee

collaboration's creativity and overall effectiveness are important factors at the later stages of the employee voice process, where raised concerns and suggestions are worked on and addressed by the workplace community. In support of Connolly's findings, Wilson experimented in the work context, witnessing the same effect of anonymity in the decision-making setting [347]. Small anonymous groups of four to five members contributed more comments and unique ideas, producing them with higher frequency than groups without anonymity.

The positive view on anonymity in the GSS field is based on the belief that it helps establish equal participation for group members and allows them to speak their minds. At the same time, the digital nature of the channel allows them to contribute more often and more quickly than they might in a non-digitalised environment where there are easily identified. Additionally, the anonymity aspect of GSS tackles and reduces the perceived fear of embarrassment, fear of social disapproval, and fear of potential negative repercussions, such as sanction or social isolation. Generally speaking, free speaking and more open and rare/controversial ideas emerge while encouraging honesty in responses without fear of direct reprisals. The process helps other group members to provide an honest evaluation of ideas or contributions solely on the grounds of the quality of the idea.

On the more critical side, some GSS researchers have explored the role of anonymity in the domain, concluding that its outcomes vary and might negatively affect the quality of ideation [80,169]. They argue that anonymity can encourage participants to be too sarcastic and spiteful in their responses to others and their evaluation. The also become more direct and aggressive in their comments, leading to a rise in the conflict level in the group. Moreover, anonymity can make it too easy to hide the lack of individual effort while highlighting the contribution of a particular member [168,347]. Finally, anonymity can act as a filter that masks communication and decreases the value of information flow, making it slip away more easily. However, in the employee voice context, some of the negative arguments around the effect of anonymity do not hold since employee engagement in the voicing can be rooted in individual preferences and the drive to share concerns and ideas.

The distinction here is that some GSS research was done in controlled laboratory settings, whereas other studies are completed in real-life field studies. As shown, the results from controlled laboratory studies are less coherent and more mixed than field ones [79,347]. GSS research indicates that a digital tool with anonymity as a property varies in its effect and implications for communication and outcomes, depending on the context and environment of that collaboration process. It can be negligible, positive or negative, depending on the level of involvement and interest of group members in their task [168]. This interest could result from the direct influence on employee's work arrangement, quality of work, or another individual, collective, or professional reason ingrained in the task. Therefore, participants may feel obliged to contribute more. In the case of the employee voice, these factors can be supplemented by the notion of risk and potential repercussions connected to ill-received inputs. Moreover, GSS research highlights the direct connection between the existing dynamics within the group (or organisation, in case of the workplace) and the necessity of the anonymity property of GSS [79], indicating that it is less needed in small and highly connected groups than large and more heterogeneous groups.

These considerations around GSS and anonymity highlight an interesting issue of tailoring the digital tool according to the task or process it aims to facilitate. In the case of employee voice, it means tailoring a tool that will support creating a trusted workplace environment and provide a basic mitigation scenario for personal and organisational inhibitors while leveraging the contextual facilitators in the same organisation. Social Networks and specifically Enterprise Social Networks (ESNs) are often brought into play to promote such a trusted workplace environment for sharing, peer-to-peer engagement between employees, and as the alternative to the task-focused GSS since they have more generalised and broader use. In Section 3.3 below, I will discuss this point in more detail.

3.3 Enterprise Social Networks

Employee-coordinated action, engagement and voicing bring many benefits for organisations, while social networks as a concept allow collaboration, the sharing of ideas, and coordination of group actions. To achieve both of these goals,

companies often use digital tools modelled after popular social network sites (Facebook, LinkedIn, Twitter, etc.) to support employee engagement and collaboration and provide digital space for voicing their views. Gallup reported that disengaged employees cost billions of dollars per year in the US alone [133]. Thus, the main reason for ESN deployment is to allow employees to communicate, collaborate, consume and create knowledge in a new digital way. The idea behind it is that it supports employee satisfaction and improves their engagement which leads to higher performance, and as a result, increases organisational knowledge due to better work practices [10,27]. Examples of such ESNs are Slack, Yammer or even Facebook's Workplace sub-system. These digital spaces allow employees to initiate work-related groups drawn from the shared interests of individuals, which corroborate with the previous research that showed that social context linked with the social network could increase performance in task-driven processes [187].

On the individual employee level, ESNs such as these are often perceived as valued by employees as a way to follow colleagues and receive and distribute news [272], and as a space to seek information from more expert peers [56]. Of course, there is always a notion of public picture creation and self-advertising since staff members who are more active and visible on ESNs have greater chances to influence senior members and be promoted quickly [321]. Despite the negative connotation, this adheres to the employee preference of informal rather than formal channels. Indeed, the work conducted by Stieglitz, Riemer and Meske indicates that both types of communication channels, informal (through ESN) and formal (according to hierarchical position within the organisation), influence colleagues' perceptions of employees' views. The study shows that informal communication through the digital platform has a more substantial effect than the formal hierarchical-based position due to a stronger influence on 'information diffusion'. However, this is not only the point about the improvement potential for ESNs based on the user-driven communication and sharing of knowledge, informal communication mechanisms can complement and even surpass the formal ones. From this perspective, the advantage of ESNs is the theoretical ability to distribute the information through horizontal and direct connections

within your 'followers' and 'connections' without relying on organisational structure. Osch et al. referred to this as 'boundary work' in their analysis of ESNs [272]. The authors identified boundary work as the ability to effectively conduct work and communicate across teams and between groups Ancona and Caldwell identified three types of cross-boundary activities:

- *Representation*: creating a favourable impression of the individual employees or teams up the organisational hierarchy,
- *Coordination*: facilitating an effective decision-making process across boundaries,
- *Information Search (knowledge sharing)*: examining the other department and team environments, searching for relevant information, suitable knowledge, and additional expertise [6].

Previous research shows that ESNs are especially fit for the first and second types of cross-boundary activities since they increase the visibility of individuals, teams, and their information. Colleagues and higher-ups are made aware of their knowledge and skills while allowing to locate expertise and relevant information purposely or not [273].

However, Recker, Malsbender and Kohborn examined ESNs as an encouragement tool for increasing creativity and innovation within the organisation [289] and concluded that despite the flattened structure and direct connection, ESNs still bear hierarchical footprints. ESNs represent a slightly changed and modified hierarchy itself. For instance, they have shown that ideas initiated by senior members or users with bigger audiences got more support and recognition. Thus, it emphasises the importance of designing ESNs or activities within them with deliberation of the specific roles and the time requirements needed and allocated to the network from the employee side, considering the power imbalance between low-level employees, higher-ups and ESN users with a bigger audience. The question of applicability of ESNs to the employee voice context and their ability to facilitate safety and privacy while mitigating fears and presumptions of employees and managers remains.

Research on 'boundary work' shows that ESNs can improve the coordination and collaboration between team members, helping them structure their communication process and information processing inside the team [69]. Even though such collaboration lies outside the notion of cross-departmental communication, it shows a certain degree of support that ESNs (and digital tools as a communication method) can provide in the case of informal, direct and problem-solving task-based work [237]. Thus, Chin et al. have suggested that ESNs can be helpful for organisational problem-solving [56]. However, as the research highlights, their work has shown that the more upper management members are involved in the problem-solving process and the better the 'perceived organisational facilitating condition' is, the better the support the ESN can offer. The quality of communication and discussion in ESNs depends on the position and authority of staff members within the organisation. However, discussion and sharing of opinions remain the most common focus of the ESNs [294].

Inevitably, ESNs can be a valuable tool for management to monitor employees' involvement in and perceptions of their work, their colleagues, or the organisation in general. The health and reputation of the company among staff members [310] provide management with good insight into what is done correctly and what needs improvement. However, it can negatively affect ESN adaptation as workers perceive a loss of power and privacy and hesitate to speak the truth or challenge the status quo [199]. An evaluation of ESN use guidelines found that individual transparency and the possibility of being identified as the author of a comment or post are crucial factors that distress employees and influence the degree of ESN adoption [194]. Employees might fail to engage with ESN at the required level [272]. Anonymity subsequently becomes the suggested preferred element of space for addressing this issue.

3.4 Online Discussions

3.4.1.1 *Anonymity*

In principle, the research in the GSS domain shows that anonymity can be beneficial and help foster workplace communication and collaboration [154,347]. For instance, people tend to react more positively to feedback from an anonymous

source than a named peer or authority [262]. Researchers examined the power dynamics between the receptivity of the receiver and the tone of feedback, finding that criticism and challenging reactions were more effective when constructive and affective language was used, thereby increasing affirmative emotions and decreasing user's frustration. In addition, participants were less offended and responded more positively when this feedback came anonymously, which led to a growth in the quality of work. Feedback without positive affective language or that explicitly came from the source of a higher position led to more edits, but not necessarily to a better work outcome. One interesting observation from identifiable feedback was that people perceived comments and criticism from higher-ups as more valid and reasonable than those from their hierarchy level or lower. Anonymity could be a mitigation mechanism for providing honest and clear feedback to managers and colleagues of the same level. Relatedly, research by Griffin, Kadous and Proell has shown that colleague support and opinions can significantly encourage or discourage an employee from speaking up, showing how this initial contextual aspect can influence the voicing process [145].

Anonymity can also render itself useful in the crowdsourcing context and idea generation tasks [320]. Results indicate that anonymous groups produce more original ideas and comments under the brainstorming conditions compared to the groups with identifiable members. They are also likely to improve on those ideas more quickly than named groups, supported by previously discussed research in GSS concerning anonymity [65,168]. The application to communicating within groups, teams and especially workplace collectives is that anonymity is helpful against the potential 'social cost' assigned to any post or comment that identified community members might leave [215]. The concept of the social cost was originally defined as social consequences of public help-seeking if it fell into three specific categories [202]: *(i)* acknowledgment of self-incompetence by showing an inability to solve issues on their own; *(ii)* acknowledgment of inferiority in comparison to others, by asking for help the seeker is acknowledging that others have superiority in knowledge, skills or resources; and *(iii)* acknowledgment of dependability on others (by asking for help the seeker admits an inability to complete a task alone without contribution from others). From this individualistic

perspective, asking for help equals admitting self-incompetence, inferiority, and dependency on peers. In the case of an online community context, in addition to being unwilling to let others think less of themselves, participants do not want to bother others [266] and are reluctant to reciprocate [203], supplemented by being hesitant to reveal personal information [36].

However, anonymity helps to mitigate the social cost and damage to the social image through the hidden identity of the author, protecting the seeker from any judgement and different treatment based on their identity [177]. Indeed, previous studies in psychology have found that people care less about their social image in anonymous conditions than non-anonymous ones, demonstrated in a study where people comply more with the taxation rules when the risk of public recognition is presented [51]. Similarly, users have a lower level of social anxiety when they are anonymous [174]. Overall, anonymity can render itself a universal communication property that can address several social factors at once, mitigating associated individual social costs while introducing potential drawbacks for a community and the goal of such communication.

Consequently, anonymity can be problematic and cause issues when left on its own: controls are needed to ensure the civility and constructiveness of communication. For instance, it can erode self-censorship, with anonymous users willing to over-disclose [174] or even engage in frank conversations to the extent that it exceeds professional norms [101]. Previous research in HCI showed how mischief can reflect appropriation of the digital technology [188], however in the anonymous setting it can also lead to toxic behaviours, such as directly insulting other participants [325] and cyberbullying [313].

Indeed, most anonymous digital platforms adapted for use within the workplace have encountered serious problems that arose from anonymity. These include currently defunct systems such as Whisper and Secret, both of which had a geolocated focus. The latter even had special 'rooms' that corresponded to a specific workplace. The Secret was closed down by its founder citing ethical issues [166], reaching the same end as the earlier 'Juicy Campus', a completely

anonymous online message board for colleges that ceased to exist in 2008 after several failed efforts of making the users less 'cruel' [291].

> ***Matt Ivester, the founder of Juicy Campus****: 'I wish in retrospect that I had been able to shut it down and say I don't want to do this anymore. I think I was naive in thinking that I would be able to turn the tide. I posted a letter called Hate Isn't Juicy, trying to encourage people to think about what's the difference between what's entertaining and just being mean spirited'.*

The argument is, of course, that pure anonymity by itself is a double-edged sword that has to be contextualised. Anonymity cannot guarantee constructiveness and civility without the pre-existing conditions that can support that [34,61]. The relationship between anonymity and civility illustrates an example of such two-sidedness of anonymity as a characteristic of the discussion (or system that promotes it): on one hand, it provides a necessary 'safe cloak' for authors to hide their identity and evade the name-calling and possibility of a direct insult. Conversely, it becomes easier for others to leave frank and offensive comments without consideration due to the same protective 'safe cloak' [61,275].

The most predominant and actively studied (but also already defunct) digital system, the Yik Yak, focused on anonymity and locations, including and specific workplaces at the later stage of its existence. The Yik Yak attracted controversy surrounding cyberbullying [209], and it became known for the highly inflammatory nature of posts made and the lack of accountability [32]. Many posts included vulgarity, sexual references and trolling. The initial context from which the Yik Yak emerged is university campuses, even though most discussions and posts were contextual and focused on-campus life. Researchers have suggested that appropriate community policies can mediate this toxic online behaviour, which imposes additional commitments on platform owners or the community itself. The emphasis is on the community's and peers' role in mediating toxic behaviour and developing safer, more responsible communication norms [215,276].

Another limitation of anonymity that needs to be addressed in its application context is the authenticity of results, especially when it comes to the process that

relies on feedback or data collection through anonymous channels. This concern mainly stems from the perceived anonymity of participants. It exists in both digital (online) and real-world (offline) scenarios due to the necessity of results validation and collection of the participants' authentic experiences, which becomes critical when sensitive and consequential topics arise during the employee voice activity [34,225]. Generally, it is a complex issue of balancing out the overall affordance of the channel for employees and maintaining its authenticity in the eyes of managers and other colleagues [110,225].

Regarding the workplace context, such anonymous systems have been particularly unsuccessful in facilitating speaking up or supporting employees' collaboration and coordinated action [257,316]. Most of them followed the path of Yik Yak and Juicy Campus and became a place for rants, gossip and bullying where irascible behaviour becomes the norm [257]. These simply cannot form the basis for constructive and actionable workplace dialogue. The most recent one (still functioning) is the Blind app. Initially promoted as a Yik Yak for work, Blind attempted to avoid these issues. The inter-community and inter-organisational app encourages anonymous employee sharing between one or many different organisations, often coming down to whistleblowing [71]. However, this app required users to register by using their work email address, in addition to allowing access to their LinkedIn profile for additional verification. This method was shown to be problematic because the app internally links pseudo-anonymous users to their identity and posts that they make, potentially resulting in identification in case of a leak [341]. Another property that seems problematic concerning employee voice (as was defined earlier) is that Blind and other similar platforms rely on community-driven reactive moderation: that is, the posts and comments are removed only if enough other users deem them inappropriate.

The disparity and the lack of a well-defined mechanism for the digitalisation of employee voice are significant issues. In combination with anonymity, voice affordance and maintaining the validity of collected results and data, these issues highlight a gap for further research and the potential for designing a system to address these problems. In such circumstances, the idea of self-governance and 'sanitisation' of participant contributions may be considered an affordable method

of coping with negative aspects of anonymity. Such methods are usually achieved by moderation within the community or platform providers (in the digital channels).

3.4.1.2 *Moderation*

The concept of moderation is a process by which posts and comments in online discussion forums are edited or removed to shape the nature of the discussion. It acts as a protective mechanism for the online community from itself and, specifically, its expressive and non-compliant members. In the case of anonymous forums, it could include checks against inadvertent personal disclosures that would pierce the cloak of anonymity or additional measures for preventing offensive abuse and inappropriate disclosure [101,174]. Additionally, moderation ensures genuine productivity of online discussions, especially in anonymous online discussions, where the social cost of disrupting discussions can be low [162,350].

Effective moderation and how it can be achieved in the different digital contexts becomes an important question. The advantage of anonymous systems that allow users to post freely without fear of repercussions represents a challenge to moderation in this context: potentially high resource requirements due to the associated level of higher posting activity and potentially more inflammatory contributions from users [184,288].

The traditional response that many digital systems rely on is implementing the reactive moderation mechanism that allows users to self-regulate their community (e.g., Reddit, Wikipedia). One example is to use status or reputation scores to manage the posting behaviour of the users [197], which provides them with the instruments to regulate their behaviour and eventually formulate the posting rules and accepted behaviour norms (code of conduct) within the community. This type of moderation is essentially efficient. Still, it has a significant limitation: a typical offensive post is usually only removed after a certain number of users have already looked at it and flagged it. The implication here is that it is difficult in a more sensitive context due to the higher social cost of each misconduct [171,306]. More general assumptions that are prone to backfiring include relying on the kindness and constructive nature of most of the

user base. This assumption cannot stand in an environment with a relatively fluid membership in which users with different values can overtake the way communication is happening [337].

Another method that is becoming more popular with the development of the machine learning domain is the growing use of automation and auto-detection [52] to manage the moderation burden. These systems are usually based on rule-based or classification techniques to clean discussion threads from irrelevant content, spam, obscene or malicious comments [76]. Rule-based techniques are based on the widely known stop (obscene) words and phrases used to detect inappropriate messages. At the same time, categorisation looks deeper into the semantic, mood and overall interconnection within the comment or discussion thread to determine its value in the context of the discussion. The downside of these techniques, outside the general online discussion space, is that they are not as effective in the prevention of accidental or intentional (self-)disclosure unless they are manually crafted for that specific context while providing a limited capacity to address an intentional obfuscation by authors [277].

In the case of employee voice, context awareness and particular sensitivity towards the discussion topics are crucial for detection of (self-)identification. Proactive moderation that allows content to be validated before publication is a way to ensure that all user contributions are manually reviewed before adding them into the discussion. This method has shown some promise in preventing bullying and reducing negativity, but requires intensive staffing (often of a volunteer nature) [29].

Another concern regarding moderation (especially in proactive moderation) is the governing process and the balance between moderation and censorship. If this concern is not addressed, this can lead to fear that has a chilling effect, reducing the quality and frankness of conversations, especially debates [264]. The issues of quality of moderation and the ability of moderators to stay aware of the sensitivity of particular topics reflect this, especially when it comes to minorities within the community [52,171], particularly in cases where no measures are implemented for protecting those communities against stereotypically defined and

driven behaviour [284]. When inadequately controlled anonymous discussions are subject to less civil and relevant content, the Broken Window effect can also be exclusionary within and outside the online forum itself [125]. As an activity, moderation demands certain skills and the ability to command user respect and integrity when it comes to content that is difficult to judge.

The final point regarding issues around moderation is the difficulty of recruiting moderators of sufficient skill, affecting the overall quality of moderation. Usually, moderators are volunteers, and often few details are transparent about their skills and training for performing the job for users [66,170]. Any digital system employing this mechanism will need to manage this issue that revealed itself in the Case Study 1, discussed below.

Chapter 4 Case Study 1: Designing Bottom-up Employee Voice (Cycle 1)

4.1 Introduction

As described in **Chapter 2** and **Chapter 3**, previous studies have examined issues related to employee engagement, voicing, workplace and digital collaboration, including ways that this collaboration can be configured for a better impact (IR, HRM, OB); the degree of participation (GSS, CSCW IR, OB, HRM) and the support of trusted communication channels (GSS, ESN, HCI). One significant area that remains largely unexplored is how digital tools can facilitate employee voice and overcome organisational and personal barriers to speaking up (**RQ1**). This area, and the associated design space, is the primary concern of this thesis: the digitalisation of employee voice, how it can be translated into organisational practices, what opportunities it brings for a wider engagement, and the potential challenges one can face on the adoption journey.

In this chapter I introduce *OurVoice*, a secure anonymous system for facilitation of the employee voice that supports employee-driven discussions, sharing of opinions, and identification of issues. I first discuss the motivation and principles underpinning the design process, including the steps taken to understand the essential qualities of how a digital system can be designed to create a trusted space for sharing issues, opinions and ideas. The iterative design workflow of a digital prototype is explored, including the steps for safeguarding and supporting employee voice and employee engagement. At all times I attempt to maintain a focus on employee perception of the tools and methods that can benefit engagement and the quality of organisational changes that result.

As discussed in **Chapter 1**, an Action Research (AR) methodology has been employed with a view to furnishing insights through the continuous application of, and reflection on, the prototype systems. Thus, the AR approach was applied to the iterative design of the digital prototype in this case study, with a view to addressing my two research questions (**RQ1**, **RQ2**) in three study cycles over a

period of two years. **Chapter 4** focuses on the first cycle in which I explore the problem domain and the design of a tool to facilitate employee voice. **Chapter 5** includes an account of a large-scale deployment, and **Chapter 6** explores a management-initiative employee appropriation of the system and process.

4.2 Design Motivation

The initial idea of a digital system that could facilitate frank discussion within the workplace community was derived from the reaction to a discussion between the researchers (the author and supervisory team[4]) and members of the nursing community around zero hour contracts [9,140] and the increased casualisation of employees [23,40]. Members of the nursing community discussed their previous negative experience of working on zero hours contracts, the associated insecurities of job position and the effect on their mental health. The impact of such contracts is perhaps not that surprising, considering the shift to casualisation and short-term contracts in other industries and countries [23,137,280]. The discussion provided the author with the initial incentive to explore employee engagement and speaking up in a workplace to better understand the context and existing approaches for dealing with voicing issues. That research resulted in a review of the existing literature and identified the several aspects that influence the design and applicability of the system for employee voice.

4.2.1 Employee Voice and Fears.

The first aspect to consider in designing future systems contributing to employee engagement and digital system functionality is employee voice and employees' corresponding fears and preconceptions. The literature review demonstrated that the concept of employee voice and the creation of organisational culture and associated organisational systems to promote it could help address different issues that staff members face [16,25,126]. One specific type of voice that was of interest

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[4] At the beginning of my PhD (in Newcastle University, UK), when the first cycle of the Case Study 1 was held, my supervisory team consisted of Patrick Olivier (my current main supervisor), James Nicholson, Pam Briggs and Vasilis Vlachokyriakos (my current external supervisors and collaborators).

to the author (due to the initial angle of the study that came from the discussion with nurses) is grievance and speaking up regarding concerns and issues and particularly, managers' reactions to it [189,236], as this forms employees' perception towards voicing issues [47,84]. If implemented correctly, it can be beneficial to organisations: increased employee satisfaction and retention lead to improved organisational reputation and a better understanding of its operations across all participating levels of staff [2,46,161]. Moreover, that these 'aware' organisations can take advantage of the wisdom accumulated to benefit from enhanced decision-making [2], while employees can benefit from better work-life balance, an improved workplace environment, a sense of participation and ability to influence decision-making [41,59,129].

Complex relations exist within organisations and sometimes across whole sectors (e.g., nursing and teaching staff casualisation). Given the volume of workplace-related issues that occur in different sectors, from workplace bullying [13] and violations of labour laws [74,213] to workplace harassment and discrimination [316], it is predictable that there are many challenges to the promotion of employee voice. These challenges are predominantly expressed as two types of issues: on one hand employees need to be assured that they can express their views frankly in a constructive manner, without reprisal risks [47], while on the other, employers need to verify that employees' voicing is a proper representation of the in-field situation in their organisation. Employees generally prefer anonymity, directiveness, informality, collectivism and being protected from reprisals by acting as a group. In contrast, employers prefer formal mechanisms that more tightly replicate an existing structure [90].

Various barriers can inhibit employee voice. Some are more practical (e.g., lack of channels, organisational tendency to keep employees silent), while others are more subjective and perceived (e.g., internal fears). A lack of communication channels for employee voice could lead to employee silence [252], however, the biggest barriers are the internal employees' fears and concerns, which include the following [88]:

- Fear of consequences, including embarrassment, isolation, low-performance ratings, lost promotions and even firing.

- Futility.

- Social awkwardness.

- Working place/community 'injustice'.

- Believing in the sparse nature of the issue (thinking that they are the only person experiencing that problem, unaware that others are too).

Another less obvious reason is that voicing activity requires time and occasionally emotional investment and energy, especially if a concern is around a subject about which an employee is particularly passionate [161]. Thus, the idea of utilising the digital environment to address these identified fears emerged, focusing the attention on collaboration at the workplace, the role of online discussion facilitation and anonymity within it.

4.2.2 Collaborative Work

After reviewing the Collaborative work domain, the collaborative aspect of the designed system was examined through the model of the Coordinated Actions (MoCA) by Lee and Paine [201]. The idea of MoCA and insights from the literature on employee voice formed the basis to amend the original MoCA model. In this thesis, the author reconceptualised it as a designing framework for the collaborative facets of the employee empowering digital technology. It acts as a design framework for systems that promote a trusted and favourable environment for speaking up. The necessity of workplace collaboration to drive the employee voice and digital aspects of such coordinated efforts led to the application of MoCA as the base for the facets that intended to provide structured conceptual support for the design of technologies for employee empowerment. Inevitably, they interact with each other: the degree to which this occurs in a particular setting depends on the organisational context. Other facets not mentioned in MoCA are derived from the Employee Voice and Psychological Safety issues by identified by HRM, OB, IR, and GSS scholars and initial interviews described in 4.3 (such as Safety & Protection, Individualisation/Cooperation, Planned Effect and Constructivity). The nine facets are as follows:

1. *Safety & Protection.* The level of importance and degree of facilitation of identity protection provided by a given technology. All our interview subjects explicitly identified the ability to contribute to discussion safely (e.g., anonymously) as an enabler of participation in such activities.

2. *Individualisation/Cooperation (I/C).* The nature of relationships, the required communication between employees, and the extent to which this should be framed for the individual (Individualisation) versus many collaborators who engage in dialogue and action to achieve a common goal (Cooperation).

3. *Common field (Work).* The extent to which the employees can be considered a community with a shared field of work, common environment and potential aims [304]. This is a particularly significant consideration where a system aims to engage employees distributed across multiple (potentially spatially distributed) sites or even organisations.

4. *(A)Synchronicity.* Whether employee voice and coordinated action are best supported synchronously or asynchronously [172]. This facet relates to the nature of the cooperative effort envisaged but must also be considered in the context of the organisational structure and culture, including communication practices.

5. *Scale.* The principle of scale implies that coordinated action becomes more complicated when more employees are engaged [67]. Scale issues affect the specificity of topics that can be productively discussed and acted upon (e.g., issues related to specific workplaces). Conversely, the scale can also increase collaborators with particular knowledge and make alternative experiences more accessible.

6. *Number of Communities of Practice (NCop).* How the scope of employee inclusion (in a system) relates to the range of employee expertise or employee functions. This is a significant consideration for organisations with hierarchical management structures, strong functional delineation, or where work roles are internally valued very differently.

7. *Planned Effect.* The nature of the desired effect of coordinated action and the system's ability to facilitate this. For example, there is a significant difference between anonymous discussion and action: the latter requires employees to act, and thereby reveal their identity. Where this is required, systems must facilitate such a transition that employees do not become exposed.

8. *Planned Permanence.* How long the cooperation is designed to last plays an important role in delivering the proposed effect. Being integrated into the process of change can assist the cooperation to become more effective and accepted.

9. *Constructivity.* The controls and measures are in place for preserving the constructive, focused and protected (from unintentional self-disclosure) flow of dialogue between employees. This facet is a recurring theme of our interviews and is tightly linked with *Anonymity*.

With this design framework in mind, I analysed the set of existing enterprise-focused social networks and digital tools for communication to reflect on the extent to which these ESNs are likely to act as empowering technologies in the workplace from the point of view of empowering employee voice.

4.2.3 Enterprise Social Networks and Organisational Communication

Chapter 3, suggested that digital tools used in an organisational context or Enterprise Social Networks (ESNs) are often initially brought into play as the internal organisational tool for communication, as channels for expressing employee viewpoints, albeit with some drawbacks [113,272]. These ESNs are modelled on popular social network models such as Facebook or WhatsApp and offer employees the opportunity to find and form groups with colleagues who share the same interests. Employees usually see them as a valuable means to follow other workers and obtain news [289], as well as to seek information from peers with greater expertise in a subject [237].

To understand how existing ESNs adhere to the collaborative facets of the employee empowering digital technology, I marked them per their support of each of nine facets. The purpose of analysing these ESNs against the employee voice empowering facets is not to determine which digital tools are the best or worst, as they have all been designed with specific, sometimes unique, cases in mind. Rather, the goal is to understand their suitability for employee voice solutions. Table 2 shows that some of the systems (LinkedIn, Yammer, Secret) focus more on presenting users as individual contributors with specified contribution goals. In contrast, others (Blind, Meetoo, Speakapp) acknowledge a more cooperative context, providing mixed instruments from which a user can choose.

Table 2. Existing ESN's classification against the employee voice empowering facets. As can be seen, no one system incorporates all of the facets that we have identified.

Facets\ESNs	Slack	Yammer	Social Blue	Whisper	Secret	Blind	LinkedIn	Speakapp	Meetoo	Facebook Workplace	Ideal Employee Voice System
Anonymity	No	No	No	Yes	Yes	Yes	No	No	Poss. (L)	No	Yes
Indiv / Coop	Mixed	Indiv	Indiv	Indiv	Indiv	Coop	Indiv	Mixed	Mixed	Indiv	Coop
Common Field (Work)	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No	Yes
Synchronicity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scale	Org	Org	Org	Open	Open	Mixed	Open	Org	Org	Open	Org/ Dept
NCop	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Poss.	Yes	N/A	Yes
Planned Effect	No	No	No	N/A	N/A	No	N/A	Yes	No	N/A	Yes
Planned Permanence	Yes	No	No	No	No	No	No	Yes	Poss	No	Yes
Moderation	No	No	No	N/A	N/A	No	No	No	Pre/ No	No	Yes

For example, from an anonymity point of view, Slack, Speakapp and Yammer are not ideal, as they do not offer anonymity and are not designed for both permanence

and effect (about voicing employees' opinions). At the same time, Meetoo and Blind are anonymous but potentially lack features for preserving a constructive discussion, due to the absence of pre-moderation [36]. This classification of ESNs following the developed design framework underlines the inadequacy of such systems to overcome workplace imbalances and empower employees to discuss sensitive issues, raise concerns and collectively action their ideas. Based on the understanding of MoCA and the existing literature on ESNs, the author believes that this is due to a dichotomy between systems that are anonymous but lack effective moderation and systems that do not preserve workers' anonymity. Other employee voice system types aim to articulate employee's dissatisfaction with organisational processes (especially those that are used to express grievances and issues). The suggestion-focused types require more considerable and nuanced facilitation that can support constructive discussion while protecting employee's identities if needed. To further explore this challenge and understand the design principles for productive dialogue and preservation of safety within the workplace, a set of interviews was conducted with staff members of higher education institutes, selected largely due to a high level of casualisation in the sector at that time.

4.3 Design Process

There is a rich space of possibilities and considerations around voice and technology to enable employee's participation in decision-making. However, different design considerations affect the affordance of the voice, and the quality of the resulting outcomes is still largely underexplored. The decision to conduct preliminary interviews within the author's workplace context (higher education) was taken to understand the design space for digital technology to better support employee voice. This allowed me to draw on an insider understanding of the institutional environment from the perspective of the people who would benefit from the digital support of employee voice. The result was 14 semi-structured interviews, conducted across two universities, including a total of nine different academic departments and encompassing seven professional support staff, as presented in Table 3:

Table 3. The demographics of interviewees (note there was a total of 14 participants).

Gender	Academic	Professional
Female	3	3
Male	4	4

Apart from the university workplace, the interviewees shared the common characteristic of being involved in the local trade union (labour union). They were recruited through the internal trade union mailing lists with a message that called for volunteers to be interviewed about their workplace experiences of speaking up (if any). The rationale behind formulated questions was that based on the review of the previous works in HRM, OB, IR and CSCW fields, I was keen to understand participants views on generating changes within their current or previous organisation through participation in the decision-making process or employee voice endeavours, including their views on mechanisms that can be utilised for this, as presented in Appendix H.

4.3.1 Design space, Consideration and Principles

The data collected from the interviews were subjected to qualitative thematic analysis, following Braun and Clarke's method [37]. This approach is described as a 'more detailed and nuanced account of one particular theme, or group of themes, within the data'. Specifically, the 'theoretical' thematic analysis was used to account for information from the previous studies of employee voice, that is, of different contextual and perceived characteristics that influence employee engagement with the voicing process. This analysis led to identifying a series of facilitators and inhibitors, both personal and organisational, that collectively affect whether or not to act. These facilitators and inhibitors constitute a bigger design space for voice. They act as the base for the design goals of the digital tool that aimed to support the employee voice, together with the collaborative facets discussed earlier, presented in Figure 5.
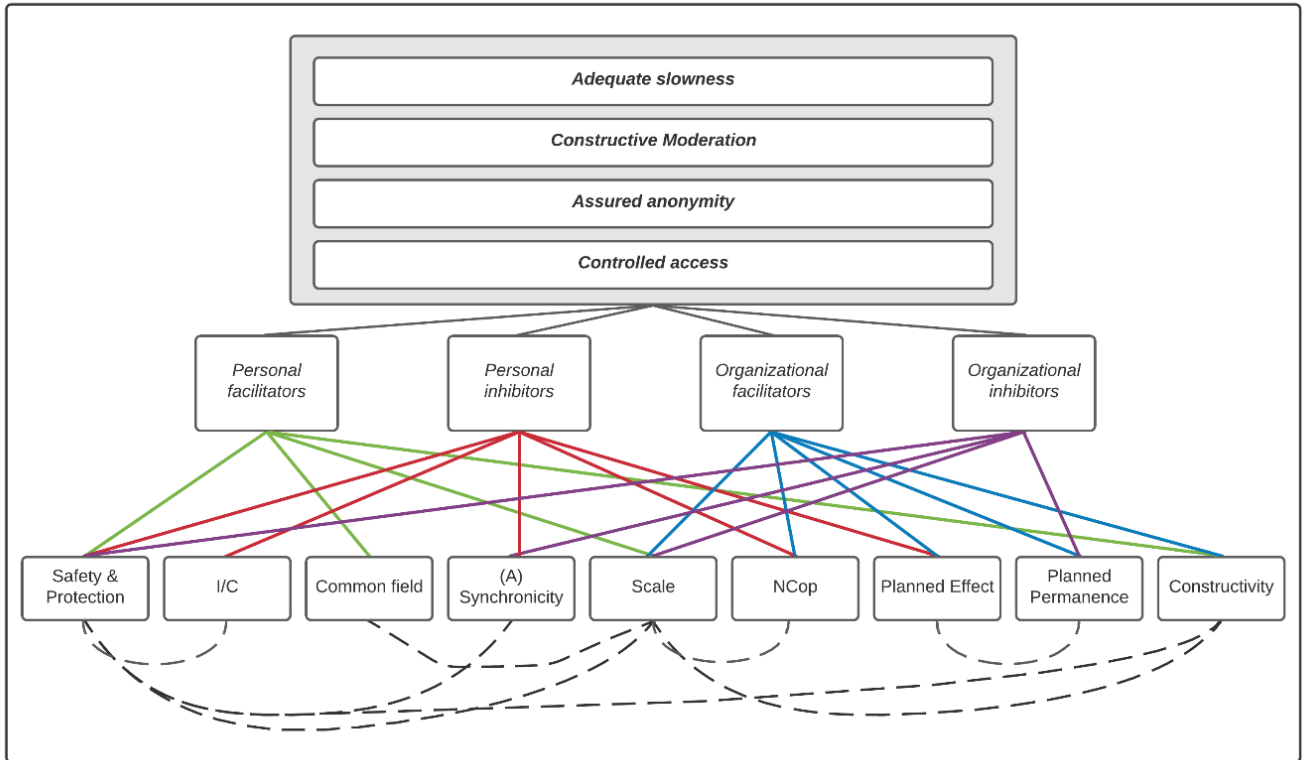
Figure 5. The design space for Employee Voice digital facilitation system and the relations between facets, inhibitors and facilitators and the digital system's design goals.

Personal facilitators. These enablers, reported by the interviewees, stimulate them to and/or increase the possibility that they will voice their concerns and engage in the discussion regarding work-related issues. These facilitators include: *(i)* belonging to a larger group with a similar goal (safety in numbers and a shared notion of the common environment); *(ii)* having a sense of seniority in the organisation due to their rank (e.g., being a professor) or due to duration of employment within the organisation; *(iii)* proximity (either social or geographical) to the recipient of the voice; *(iv)* being invited to participate in decision-making about the topic under discussion; and either *(v)* being able to participate and contribute anonymously, or to communicate informally ('in-person', face-to-face) thus leaving 'no trace'.

> *I7: 'And I guess over the last two or three years, as my stock has raised and my reputation has gained, I guess, in the department, I've been more confident to suggest maybe some alternative strategies'.*

Thereby, interviewees acknowledged that there is potential for their existing (or previous) organisations to be more forgiving of some (e.g. with seniority) and

penalising of others (e.g. newcomers or those less connected) who are prepared to voice, based on direct or indirect factors (e.g., subsequent job progression). In other words, the necessity of a safe and trusted environment that supports the speaking up activity was indicated. A further significant aspect is parity between all engaging entities (e.g., employees, managers, owners) during the employee voice endeavour; this entails demonstrating a desire for an open-to-all space, such as digital space, that also promotes listening.

> *P8: 'Yeah I really did! I really did [feared repercussions]. Because the point at which it was out of my hands and things were meant to be happening and I had to come into work every day, I was just terrified. I was terrified that the complaint would be traced to me. And that lasted for about, well, a good two months or something'.*

Personal inhibitors. These are the variety of reasons mentioned by interviewees that inhibit them from voicing their concerns or engaging in discussions about workplace issues. These inhibitors include *(i)* uncertainty about the way to raise an issue correctly (i.e., without consequences); *(ii)* insufficient trust in the organisation's capacity or desire to address the issue correctly: in other words, a belief that issues raised are highly likely to be ignored and 'brushed under the carpet'; *(iii)* a fear of being perceived as a troubled and difficult employee with perceived consequences on work security; *(iv)* a fear of being be perceived as an uncooperative person; *(v)* a fear of being perceived as the cause of disturbance and the creator of an uncomfortable work environment; and *(vi)* a direct fear of sanctions or retaliation.

> *I4: 'So I think it was a case of my manager not wanting to take the issue that I'd taken to her and… follow it through because it would have meant more work, more meetings, and I don't think {manager} was interested!'*

Organisational facilitators. These are the factors reported by the interviewees that increase the likelihood that employees would pursue coordinated action. Organisational facilitators include *(i)* approachable and transformational managers; *(ii)* the existence of clear bottom-up (formal or informal) communication channels through which to express views; and (iii) an organisation's track record of responding meaningfully to issues raised by employees.

Organisational inhibitors. These are the factors reported by the interviewees that negatively affect whether employees will pursue voicing and associated coordinated actions. Organisational inhibitors include *(i)* transactional and excessively formal management approaches in human resources; *(ii)* reduced or non-existent communication channels for employees to voice their views; and *(iii)* an organisation's track record of ignoring employees' discontent (e.g., by repeating mistakes).

> *I3: 'And this is the standard procedure: somebody talks at you and tells you what is going to happen, asks for your views and then you never see them surface again'.*

The interviewees described both positive and negative outcomes when they had chosen to voice a concern or take action within their organisation. Some recognised that organisational change had resulted from their efforts. Many felt ignored, stating that their managers had 'recited the party line', failed to acknowledge the communication or promised change without any follow-up. Some employees had experienced sanctions or reprisals as a direct result of their actions. Some perceived these sanctions as having harmed their opportunities for progression within the organisation.

Interviewees from different backgrounds displayed different levels of confidence in speaking up. A general view confirmed by many participants is that some employees who represent a group considered valuable (academics or professionals with permanent contracts) and, to some extent, irreplaceable are more vocal and express more confidence in voicing their concerns and suggestions. Conversely, employees from other groups (sessional, casualised and fixed-term contractors who consider themselves more disposable) displayed the attitude of not speaking up and having a greater fear of repercussions.

The fear that the organisation may penalise the individual, either directly or indirectly (e.g., via subsequent job progression), can be the single biggest factor preventing employees from speaking up. Thus, anyone who strives to mediate employee voice should provide a safe and trusted environment for speaking up.

Overall, the importance of parity between all engaging entities (e.g., employees, managers, owners) is crucial. Anyone who has something to say should be listened to, and anyone should have the ability to respond or criticise, regardless of either party's position. This also corresponds to the importance of having constructive and respectful communication to support workplace improvements rather than creating a toxic environment for ranting and enmity. What is required is a somewhat controlled, authentic environment that can produce evidence of support for a specific idea or concern. With these personal and organisational facilitators and inhibitors in mind, the following four discourse principles for employee voice facilitation within the organisation were outlined:

Civility. Following Brown and Levinson's definition of politeness and its relation to civility [39] as a 'positive face towards the person or community one engages with', this thesis considers Civility. Civility is a compound term for a conversation that is polite and of a constructive and respectful nature with defined ways of raising an issue and specified rules and expectations of its flow.

Safety. A conversation should preserve a safe and unthreatened manner to provoke a more open and frank flow. Measures such as safeguards and participation guidelines are employed and should be clear for all participants.

Egalitarianism. Conversation organisation and flow should be indifferent to employees' position or level in the organisation, thereby providing the ability to be heard, share an opinion and the ability to discuss and criticise if necessary.

Validity. The conversation should be genuine and trustful to engage more participants and provide grounds for authenticity and connection to the organisation.

4.3.2 Digital System Design Goals (*Plan*)

After considering the principles of *Civility*, *Safety*, *Egalitarianism* and *Validity* for a workplace conversation, before creating a prototype the next step is to understand the exact design goals of the system the prototype will adhere to in order to meet these principles and cover the necessary facets of empowering employee voice initiatives within organisations. For this purpose, the interviews were further analysed (second iteration) to cover the interviewees' technology-

related deliberations. This mainly included analysis of the participants' ideas regarding the technology that can facilitate employee voice in their workplace, as was discussed in the second part of the interview, outlined in the Appendix H. The process gave perspectives on participants' understandings of the practicalities of implementing the communication qualities (derived in the first iteration of the analysis) to develop themes that can be operationalised as a set of design goals for the digital tool. The derived goals of Assured Anonymity, Constructive Moderation, Adequate Slowness and Controlled Access form the scope of the design space for an ESN-type employee voice system.

Assured Anonymity*.* This goal is reflecting *Egalitarianism* and *Safety* principles of conversation. Indeed, safety and privacy of participants are always associated with the notion of anonymity and the ability to hide real identity from other members [175], effectively eliminating any hierarchical structure within the group and providing a sense of equal contribution. Unsurprisingly, all the canvassed participants were insistent that anonymity was a key component in an employee voice system and, equally, that employees must have confidence in the efficacy of the system in protecting that anonymity.

> I12: 'I think anonymity is an important part of this… if there is not confidence that there is a robust, anonymous system I don't think it would be worth doing.'

However, there were arguments from some interviewees that anonymity should be limited, for example, to a trusted authority or '*superuser'* (I6), because a purely anonymous system would be subject to '*flaming'* (I2). Indeed, as was discussed in the overview of previous research on Digital Anonymity 3.4.1.1, controls are needed to ensure the civility and constructiveness of communication. Otherwise, the presence of pure anonymous communication can erode self-censorship [174] or lead to conversations that exceed professional norms [101]. It can also lead to toxic or insulting behaviours [325] and cyberbullying [313]. **Chapter 3** outlined a range of technical systems that have been either designed to support employee engagement and participation or have been repurposed to this end. They have typically been more general social networks (with built-in anonymity features), and most have been plagued with serious problems [166,209,341]. Some require

users to register with their work email address or allow access to the user's LinkedIn profile (another Profession focused SN). These systems rely on reactive moderation, meaning posts are only removed if users flag them as 'inappropriate'. This property is questionable for a digital tool that facilitates employee voice due to inherited fears and preconceptions and leads to the second design goal.

Constructive Moderation. This goal was built upon three out of four design principles: *Civility*, *Egalitarianism* and *Safety*. Contradictory views have emerged during the interviews concerning the need for anonymity to be assured, as employees must be protected against the potentially abusive behaviour of others. This tension requires the implementation of prevention mechanisms such as a moderation system. In this context, moderation is a process by which the contributions of discussion participants (in this case, posts on online forums) can be edited or removed to shape the nature of the constructive discussion. **Chapter 3** outlines why it is not surprising that anonymous online communities can have the effect of eroding traditional self-censorship, with users being willing to over-disclose [174] as well as engage in frank dialogues that can exceed professional norms [101]. This disinhibition can provoke more toxic behaviour, such as insulting or 'flaming' other participants [325]. Here, moderation acts as protection and helps to ensure that online discussions are genuine and productive. If implemented effectively, it can support the *Civility* and *Safety* of discussion while ensuring *Egalitarianism* by preventing self-disclosure or accidental leakage of identifiable details.

Adequate Slowness. This goal reflects on the *Civility* and *Egalitarianism* discourse principles. Indeed, as discussed above with *Moderation*, one of the by-products of *Anonymity* is a certain level of 'flaming' and potential for abusive behaviour. Moreover, this robust moderation, with the distribution of responsibility between several moderators, will require more effort and time. Thus, a system that implements a deliberate slowness of interactions not only can provide a means of inhibiting 'flaming' but can also adjust to moderation constraints and available time. The slowness of the process introduces asynchronous elements with the restricted issuing of posts and comments at a certain time of the day. However, in a sense, this also induces a form of

synchronicity whereby people view the system and make contributions at specific times of the day, bringing a particular cadence to workplace communications which is worth exploring further.

Additionally, the slowness of interactions promotes constructive behaviour by decreasing the pace of conversation and promoting more meaningful contribution by allowing more time for members to think through their responses [354]. The issue of paced and constructive communication was raised during the interviews as one factor affecting appropriation of the digital tool and engagement with the employee voice activity. Slowness coupled with Moderation offer protection from the short outbursts that can be generated through heated discussion, ensuring *Egalitarianism* of contribution among all engaging members and providing members with a uniform distribution of inputs. These three design goals (*Assured Anonymity*, *Constructive Moderation* and *Adequate Slowness*) create additional value for the validity of the employee voice and its outcomes, as shown in Figure 6.
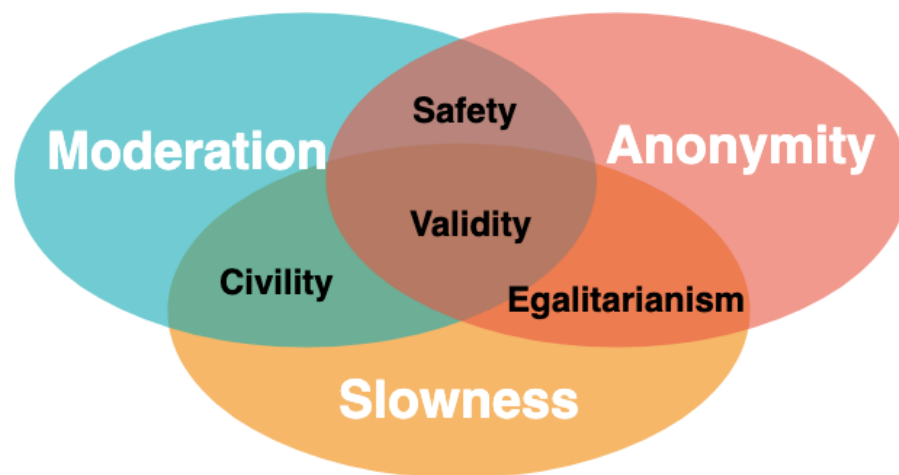
Figure 6. Design Goals to Discourse Principals relationship.

More specifically, *Assured Anonymity* provides a trustworthy space for everyone to engage, despite their position and place in the hierarchy of an organisation. *Constructive Moderation* ensures the quality and focus of the discussions and acts as an additional safeguard mechanism for a bigger engagement scope. *Adequate Slowness* provides extra protection to the quality of conversations while not disturbing users from their main work duties. The critical

contextual aspect here might be the importance of balancing these three design goals depending on a specific case and situation.

An additional design consideration that emerged during the interviews is that the involvement of an outsider (if they are not a union representative or trusted third party) who, in the eyes of employees and management, has no genuine interest in the workplace context, is considered undesirable. By providing a controlled access mechanism, the validity of the processes in the eyes of employees and managers can be additionally supported due to participation in the discussions of only genuine employees. No segregation should be made between employees to ensure discourse *Egalitarianism*. Ten out of 14 interviewees took the view that all staff members should be included.

> *I1: '…without them, our jobs would become impossible, or very unpleasant. So, technical support staff, cleaners, porters, everybody, has a stake in this university. And everybody that has a stake should have a say.'*

Interviewees stressed that discussions should eventually lead to actions that could bring meaningful changes, although they were unclear regarding the appropriate feedback mechanisms. It was generally agreed to be important to have managers participate in a digital system driven discussion for it to be widely accepted, to represent a 'soft power' mechanism that could not be ignored [50].

4.3.3 Workshops and the First Prototype

Guided by the identified inhibitors and facilitators, discourse characteristics, and design goals for the system, and based on initially identified empowering employee voice facets, the mock prototype of the digital system was constructed as the design tool for exploration with potential users. The prototype helped explore the necessary degree of addressing the inhibitors and supporting the perceived and organisational facilitators to establish a trusted digital space for employee voice (**RQ1**).

In this subsection, I will describe the initial design, followed by piloting through the workshop and small testing deployment within the academic group. This process led to the development of *OurVoice*, an anonymous employee voice

platform with strictly limited timed-release of moderated postings. This mock prototype was the first step to understand the direction for the potential solution to facilitating employee voice and serves as a first instantiation of the employee voice design framework. The prototype allowed me to evaluate a bespoke-designed system for employee voice in my workplace (university) while reflecting on the empowering facets that might contribute to its successes and failures.

4.3.3.1 *Initial Prototyping (Plan)*

The identified design goals of *Assured Anonymity*, *Constructive Moderation*, *Adequate Slowness* and *Controlled Access* led to a better understanding of the system properties that need to be addressed. The basic mock interface and initial implementation of the backend prototype were developed in an online forum-like system shown in Figure 7. The prototype was used to explore participants' attitudes towards the digital tool during two workshop activities. For the design stage that included workshops and test deployment, the prototype had the following properties:
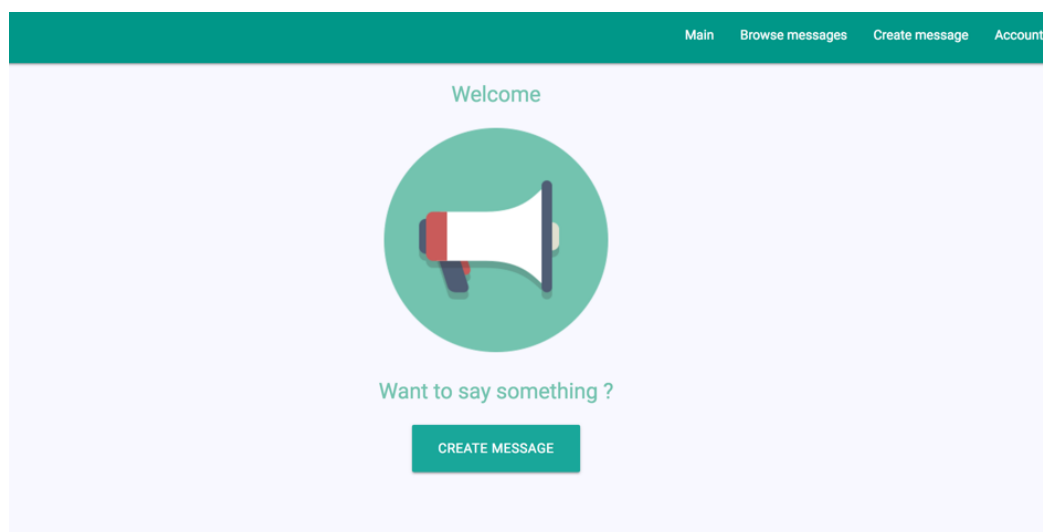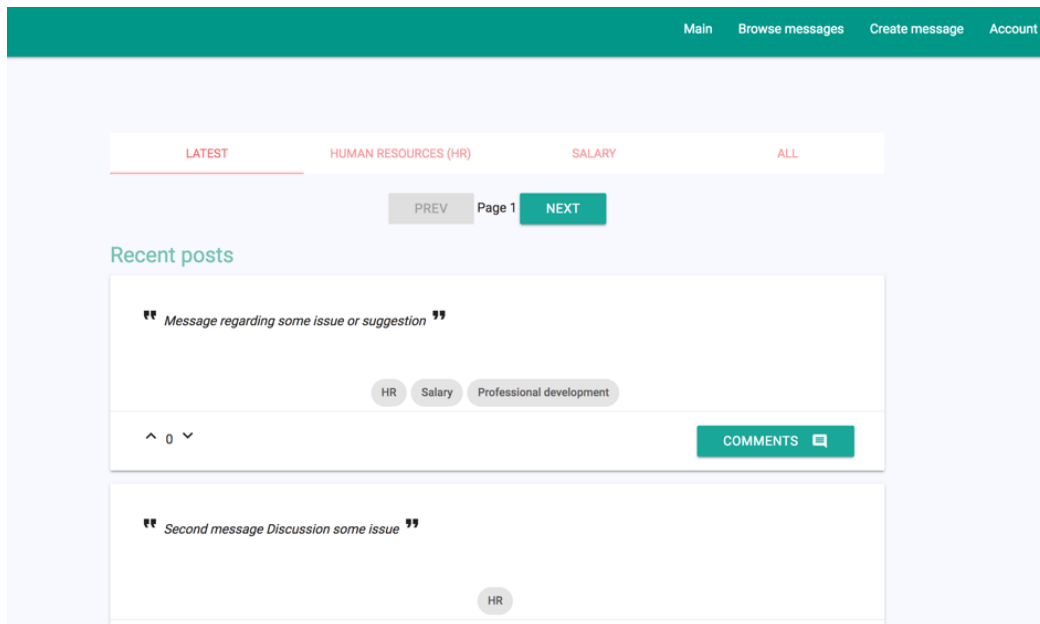
Figure 7. The user interface of the Mock prototype. a) Login Screen, b) Posts screen.

- Employees' identities are hidden from all other participants

- Ability to participate and contribute (through posts and comments in the forum-like system) irrespective of position and role in the organisation

- Availability across various device types and different locations (mobile and desktop interfaces)

- Ability to share and discuss issues with colleagues anonymously

- Authentication through work email (to validate presence in an organisation)

- The random time delay between the creation of the message in the system and making it publicly available.

Due to the flexibility of the design phase and potential changes after the participatory activities, not all of these properties were implemented at full scale in the system's backend. The properties acted as the representation of the design goals deemed necessary based on interviews and previous research.

4.3.3.2 *Workshops (Act)*

Two workshops were carried out within the author's university research group. Each workshop was 90 minutes long and had nine participants recruited through email. This research group was chosen because all participants share one workplace environment (common field and shared community of practice) and

represented one workplace collective (as it would be in the real-life usage of the digital system). The participants of these workshops were asked to discuss the potential features of the system and participate in role-based activities that mimic the real-life workplace scenario, requiring interaction with the mock user-interface. The workshops helped to explore participants' views on design goals and other related aspects, such as anonymity and trustworthiness, and the difference between the variety of possible system designs. Personas and role-play activities were used as prompts to discuss participants' views and the positive and negative experiences of speaking up, and to understand some of the concerns they had around it.

Each of the workshops was divided into two parts. In the first part, participants ranked and discussed properties of the employee voice system according to perceived importance and influence in the organisation. In the second part, two role-based activities were conducted. The participants were asked to interact with the system according to randomly assigned personas (with the dedicated role and legend) and specific scenarios. This part of the workshop consisted of two scenarios, with a discussion session taking place after each of them. The first scenario was about introducing a controversial policy within an organisation. The second scenario was about a department moving from one place to another (which in fact occurred during the real case study). Each participant had a card that outlined the persona's personality traits and position within the organisation and their attitude towards some of the issues (following the scenario in use). The rest was left to participants to decide. Finally, our participants were asked to provide feedback about their overall system use experience and possible suggestions for further improvements. The workshops were then analysed using the same approach as with the interviews.

Overall, the participant feedback emphasised the members' anonymity and explicit communication. Also, in a similar vein to the interviewees, participants expressed concern around the authentication mechanisms, suggesting that they should have accounted for forward secrecy. Authentication mechanisms need to be resilient to aversive access if the work email is used to validate that the user is part of the organisational workforce. Further, workshop participants highlighted

that it is possible to identify users by the words and language constructions they use and mistakes they make. Their views require an additional consideration around the 'sanitisation' of the potentially identifiable posts and comments.

> *W1P3: 'Obviously, there is a history to that, but just by reading this message I can understand that this was {person name}. Because I know {person} and I know how {person} speaks'.*

Another question raised is how to provide the system with accountability: that is, how to understand that all these messages from different users are not coming from a single one. It is hard to do this if the system is fully anonymous, so there should be a mechanism that at least can validate the number of unique users who participated. Furthermore, the workshop participants suggested usability and interface improvements to make interaction with the system and other users easier, such as introducing temporal pseudonyms. In this case, it will be easier to follow a conversation in comments and reply to a specific person.

> *W1P5: 'It's hard to refer to a specific person or comment. Will be nice to have something, or like colours or nicknames (randomly generated). Somehow to associate and reply to a specific comment'.*

The need for a feedback channel with the 'system owners' or initiators was pointed out. Users should utilise such a channel to reach out and report technical or usage issues or provide feedback. Participants also suggested additional interface improvements for increasing the trust towards the system and for communicating ideas of the system (safety, anonymity, and facilitation of the employee voice) more clearly. For example, users could exemplify these values by having more detailed Frequently Asked Questions (FAQs), inline tips and guidelines on how the system should be used. By clearly communicating the functionality and expected behaviour of the system, the importance of interface improvements for increasing the system's trustworthiness are highlighted. Additionally, it was suggested to have pages that can be accessed without authorisation (even by people outside the workplace) to provide users with an explanation before asking them to authenticate.

A topic that was extensively discussed during both workshops was the necessity of moderation to prevent abusive behaviour in the system and the role

of the trusted third party as an entity that can/should host the system and provide moderation services. In participants' views, it should be detached from the organisation: they expressed more confidence in a third party as a moderator and service provider than the organisation. For the mock prototype, the moderation was not fully implemented at the backend, and the publishing of messages was done automatically with a small delay after submission.

> W2P2: 'This is perhaps. This is what I thinking the way to go. If you make it explicit upfront that this system being run outside the company network or the university network and we only use your work email to verify you definitely belongs to this organisation.'

An interesting observation made during the workshop was that due to the absence of moderation and anonymous nature, interactions in the system, became abusive and non-constructive in a relatively short time (2 or 3 minutes). Although all participants were hidden under personas and their perceived behaviour, that again supported the conclusion from the background review. However, the whole concept of the workshop as an activity to probe and test the system might invite this sort of behaviour. Another question raised about the moderators was: 'who controls controllers?' and how they can communicate reasons for rejection of the post or comments? Additionally, workshop activity, in which participants ranked the desired system properties revealed that presentability and usability of the system are equally important and, for some participants, even more important than security, anonymity, and trustworthiness.

4.3.3.3 *Test Deployment (Act)*

As the continuation of the *Act* step of the first cycle of this case study, an updated version of the system's mock prototype (based on feedback from interviews and workshops) was deployed among the participants in the research group (~100 people). It included implementing the basic moderation logic without the full backend support yet, as presented in Figure 8.
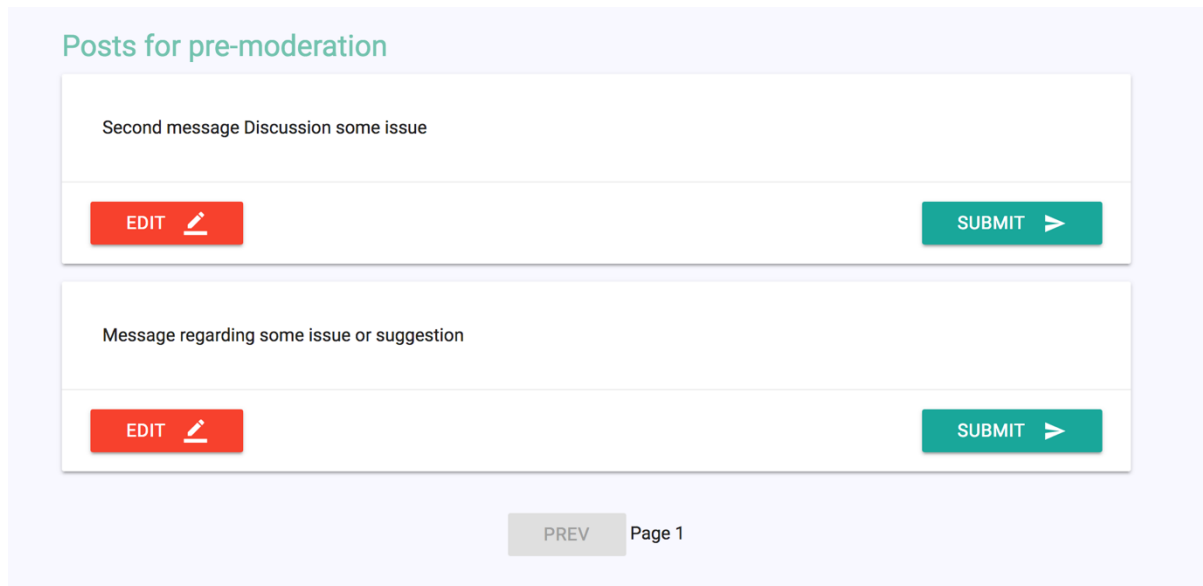
Figure 8. Example of the Moderator's Interface for Pre-moderation.

During this test, an evaluation was conducted of the prototype usage and design decisions. Test deployment lasted for two days with physical (face-to-face) moderation sessions. Each moderation session was audio-recorded and transcribed. Moderation sessions were held five times during that period: two on the first day of testing and three more on a second day. Each session lasted from 15 to 45 minutes, depending on the number of posts and the level of the moderators' skill development. For this testing, moderation teams were assembled from the research team that worked on this study (the author and supervisory team).

Additionally, the prototype stayed accessible for three more days to allow participants to submit final comments and posts. Before the testing, an email was sent to all participants explaining the procedures and structure of the testing. This test deployment did not have any particular focus or issues under discussion (unlike the workshop scenarios). Instead, it was driven by the research group staff members and students posting messages of interest or concern. Test statistics are summarised in Table 4. Topics discussed were the PhD experiences in the group, the things in the working environment that annoyed or irritated people and their attitude towards initiatives that were already or about to be introduced in the organisation. In addition, participants shared information, asked for and provided

advice, and finished with other messages and comments regarding the things that both bring joy and cause frustration.

Table 4. Prototype test statistics, summarising how each message was processed.

Message type	Overall	Accepted	Edited before accepting	Rejected
Post	52	43	12	9
Comment	82	80	7	2

Out of all messages, 11 were rejected due to the use of non-English characters, unconstructive or abusive content or deliberate uselessness (blank messages, random testing phrases, SQL-injection or script attempts, or irrelevant content). Comments and posts were altered when they contained personally identifiable information, attempts to execute (malicious) scripts, swear words, redundant punctuation, or grammatical mistakes (potentially revealing the message's author).

During the test deployment, participants offered feedback on system usage, trust towards the system, anonymity and demonstrating evidence of its anonymity in the system. Participants indicated benefits from controlling the pace of the discussion (*Adequate Slowness*); some users supported the pacing because it helped smooth 'flaming' discussions. Still, other users were against it (here and after, I will quote users as *Unidentifiable Anonymous Users* or *UAU*).

> *UAU: '…you can't really engage in a meaningful discussion with someone as you've likely forgotten about posting or by the time someone has replied you don't care for the answer changed your mind about something…'.*

This testing raised some debates around the controversial topics, showing the potential to spark a frank conversation and indicating the necessity of the pre-moderation approaches to adhere to the Constructive Moderation goal . Thus, one of the posts was about accepting non-computer science students to a PhD program in computer science and the treatment that some roles receive within the organisation's hierarchy.

> *UAU: 'Why do we recruit people to a computer science PhD who can't actually build anything? Just curious'.*

UAU: 'The way some of the {role name} have been treated has been shocking—reapplying for own jobs etc.—and has lost the {unit} (and I believe the {department}) a lot of goodwill and numerous capable staff. I don't know where responsibility for a) the decision and b) the implementation lies but it should have been handled much better'.

It is worth mentioning that after the first moderation, people started to post more sensitive material and strived to discuss more emotional issues, like '*gender pay inequality*' and physical difficulties, as an indication of growing trust in the system's ability not to reveal personal information. During the deployment, users discussed and asked for clarification about the level of trust they can put into the system and prove they must believe in it.

UAU: 'Likewise, can we see the database model for this 'anonymous network'?'

However, additional questions regarding the level of trust towards moderators were expressed in the system.

UAU: 'What if the moderators are biased how do I find out if my message has been permanently deleted and appeal that?'

These questions around the moderation process resulted in the decision to develop a code of conduct for moderators to streamline the findings and make the moderation process more transparent.

4.4 Conclusion (Reflect)

The first design cycle of the study identified both the design space and the relevant facets of collaborative technology that have the potential to support the employee voice process. I conducted a number of interviews with university employees based upon which I documented and characterised the inhibitors and facilitators of employee voice, and derived the core design goals: *Assured Anonymity, Constructive Moderation, Adequate Slowness* and *Controlled Access*. A basic mock-up of the OurVoice system was developed and used in a workshop and test deployment which furnished and number further insights and concerns, leading to modifications that improved the system's usability, security and perceived trustworthiness.

Consequently, the prototype test revealed that anonymity helped to overcome employees' initial fears and aids them in expressing their points of view. Another concept that showed promise during the test was *Egalitarianism*: the provision of a context for the communication, and message modality, in relation to which all employees had a sense of that their voices had equal significance and were heard. Of course, this also depends on the situation and the way this message was expressed, and there were examples where it was clear that moderation could have facilitated mutual understanding (or prevented undesirable disagreements). In **Chapter 5** we respond to most of these findings in designing the "production" version of *OurVoice* and explore its deployment at scale in a real-world setting.

Chapter 5 Case Study 1: Facilitating Direct Bottom Employee Voice (Cycle 2)

5.1 Introduction

Chapter 4 documented the design cycle of the employee voice digital tool which involved three distinct design activities – interviews, workshops, and prototype testing – to explore how engagement with, and the sustainability of, the process could be achieved. In this chapter I develop the architecture of the full instantiation of *OurVoice*, and complete the second cycle of this case study: the deployment of the developed system in a real workplace environment on behalf of the local trade union. This is both a technical contribution and an articulation of the contribution *OurVoice* makes to the research literature on employee voice. Specifically, I demonstrate how *OurVoice* operationalises the qualities of *Civility, Validity, Safety* and *Egalitarianism* in realising the design goals of *Assured Anonymity*, *Constructive Moderation, Adequate Slowness* and *Controlled Access*. I then reflect on the three-week deployment of the system, the diverse range of emerging discussions around key workplace issues, and the potential for *OurVoice* to facilitate organisational change.

5.2 System Overview (*Plan*)

In line with the outcomes of the design cycle, the decision was taken to develop the full instantiation of the system according to the design goals of *Assured Anonymity*, *Constructive Moderation, Adequate Slowness* and *Controlled Access*. These goals were operationalised by way of the following functional requirements for the system:

- Full anonymity and preservation of employees' identity from all other participants due to the high emphasis on hiding employees' real identities to encourage higher engagement and lower stress levels during speaking up (based on design activities and previous research).

- Text-based communication and the ability to participate in discussion through posts and comments in the forum-like system irrespective of position and role in the organisation. Text is a less identifiable and more affordable (familiar and less demanding to users) way of communication compared to audio or video.

- Desktop and mobile-friendly versions of the system available across various devices and different locations (inside and outside organisational infrastructure). To put this in practice, the system realistically needs to be web-based without a tight connection to the specific organisation or infrastructure.

- Asynchronous communication to implement *Adequate Slowness* and provoke more candid and thoughtful discussions, allowing more time for moderation.

- Moderation to ensure *Constructivity* of discussion, provide an additional level of depersonalisation and prevent accidental self-disclosure.

- One-use authentication in the system using a work email address (to validate user presence in the organisation).

- Delayed release of messages to ensure a slower pace of discussions and undisrupted flow of discussions.

- Hosting outside the organisation with clear communication of detachment from management.

- Provision of guidelines and explanations in the system to direct users through the user flow.

Based on workshops, OurVoice was also required to promote horizontal peer-to-peer communication within the workplace to increase the overall collaboration. Increasing the number of participants achieves an additional effect of safety in numbers and addresses the futility aspect of employee silence. The test deployment also led to the idea of anonymous polls that can be run by management or initiators of the deployment (in this case scenario, it was the local branch of the

labour union). Finally, various user interface improvements were applied, such as an updated theme, colours[5]. To introduce the ability to refer and reply to the previous comments while still facilitating anonymity, the assignment of random animal-based nicknames for each message was implemented, using Adjective-Colour-Animal combinations (e.g., chilly-apricot-wolf, kindhearted-green-seal). This not only preserved anonymity but also made the communication more relaxed and playful, provoking additional interaction (as noted in comments and post-deployment interviews for this study). The overall changes made to the user interface are exemplified in Figure 9.
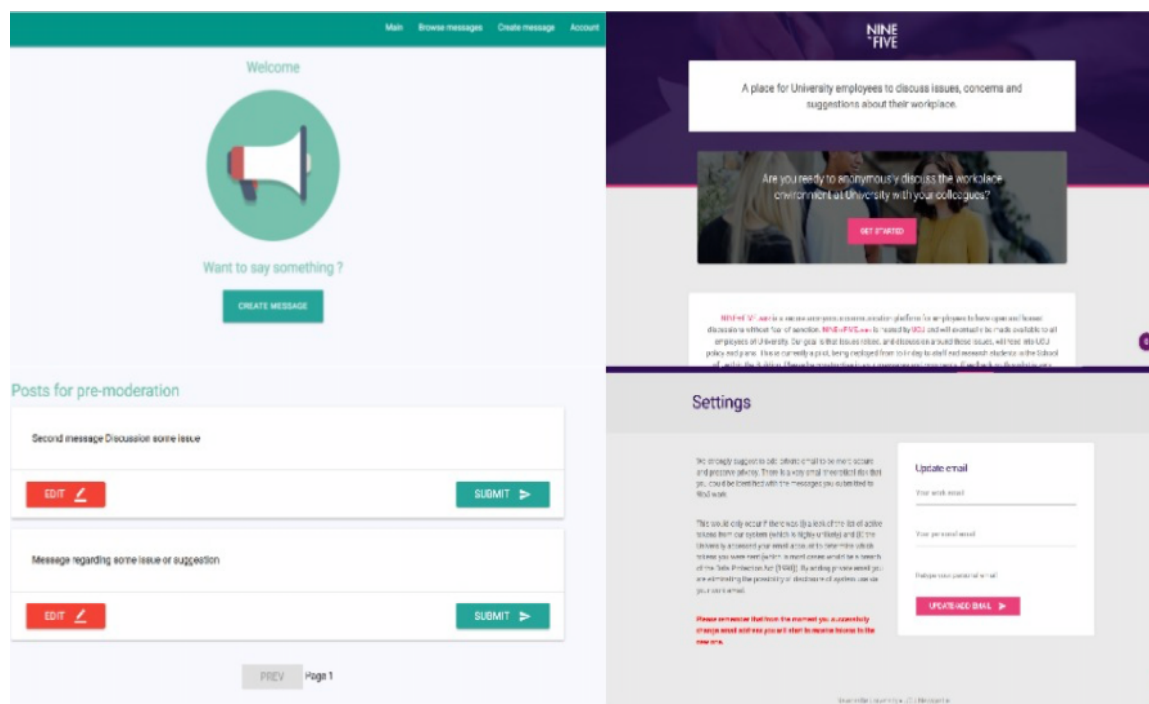
Figure 9. An illustration of the user-interface changes between the mock-up (left) and production (right) versions of OurVoice.

OurVoice is designed to facilitate employee voice through the threefold workflow in Figure 10, which includes the initial Planning and Preparation phase where initiators of the system are required to scope the project and identify the initial user base and the focus of the deployment. *OurVoice* is designed to be flexible and indifferent to the why or by whom it was initiated. Employees

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[5] CHI 2020 paper presentation with the video describing the system and showing slides with the updated interface.

themselves or their representatives, such as unions or project committees, can introduce system changes, as can managers or all parties working together. *OurVoice* does not automatically imply well-defined categories (focus topics) in the system and can be initiated with general categories around the workspace. However, based on the feedback from the participants during the design phase, the beneficial role of a pre-defined set of categories was identified. As a result, *OurVoice* allows moderators and initiators to add new categories of discussion (focus topics) over the course of deployment, based on participant requests.

The next workflow phase is the deployment itself, which includes the rollout of the system, advertising of the process among the employees (the user base), and activities outside the OurVoice system to enrol employees and increase engagement (by way of invitation emails, summaries, and subscriptions to digests of conversations in the system). This phase of the workflow is characterised by contributions from all involved parties (initiators, employees, moderators), active usage of the system, and collection of the explicit (discussions) and implicit (statistics and meta-) data. The final phase in the process is the analysis phase, involving aggregation of explicit and implicit data, identification of the emerged topics, and key discussion themes. During this phase, most of the interaction with the system and work happens between moderators and initiators (based on agreed arrangements around the data analysis). At the end of this phase, employees (users) receive feedback regarding the outcomes of the system.

5.3 System Workflow and Architecture

The OurVoice digital system represents an all-in-one solution for secure and safe speaking up within an organisation, according to the identified functional requirements derived from the discourse characteristics of *Civility*, *Validity*, *Safety* and *Egalitarianism,* and corresponding design goals *Assured Anonymity*, *Constructive Moderation*, *Adequate Slowness* and *Controlled Access.* The system is implemented in the form of an anonymous forum-like platform where employees can post messages and comments that are visible to all employees of the organisation (in an organisation-wide deployment) or to employees of the specific

department(s) (if limited to part of the organisation). Logically OurVoice can be divided into three sub-modules, as shown in Figure 10:

The frontend module interacts with the users and moderators, allowing them to submit posts, start a thread or comment on someone else's post. For moderators, it acts as an interface for editing, accepting, or rejecting users' messages.

The backend for users governs the communication logic of the system and executes planned jobs like posting messages, validating users, and providing access tokens for authentication.

The backend for moderators is responsible for data collection and processing and moderating data (posts and comments) before sending it to the user's backend for presentation.

Figure 10 provides an overview of the system and the logical sub-modules, with the corresponding technological components of the OurVoice system.
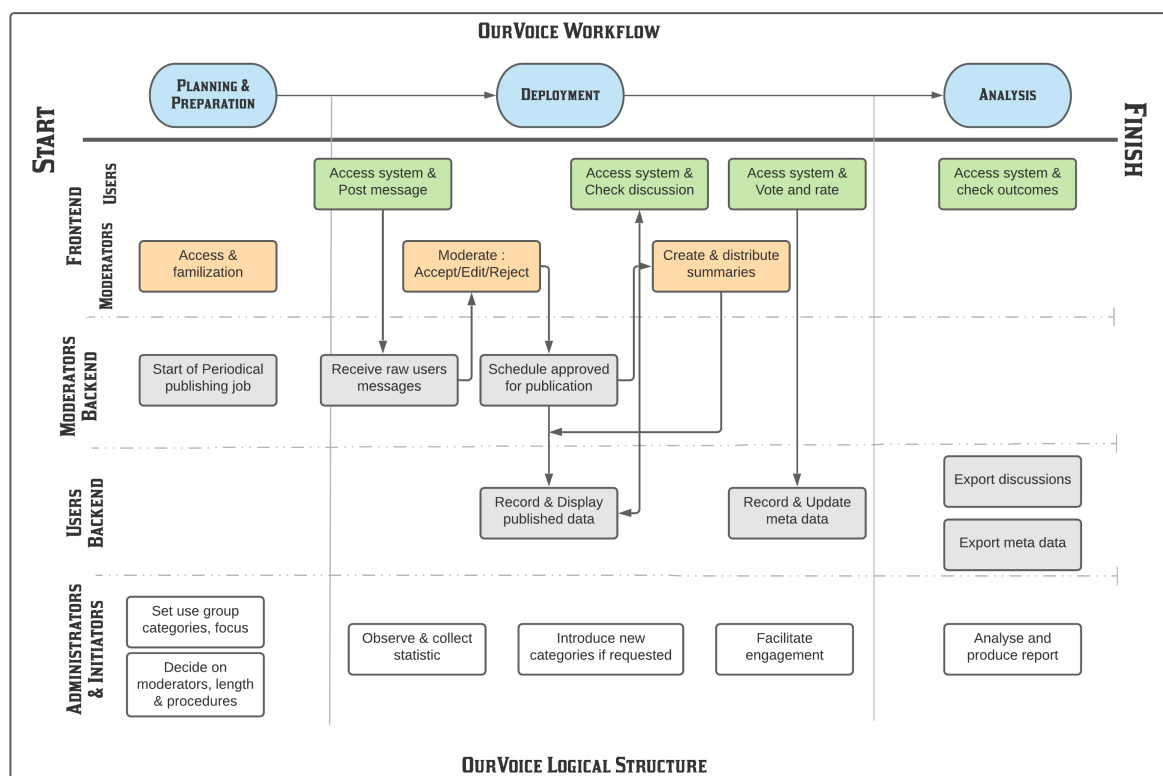
Figure 10. A flow diagram illustrating the logical structure and process workflow of the OurVoice system.

The key issue that the system addresses is the internal employees' fears. Anonymity for employees was chosen as the most acceptable way to provide a

feeling of security and trust through preserving an employee's identity. The decision to use an alternative authentication scheme was taken (instead of the usual combination of login and password). *OurVoice* uses a so-called 'password-less' authentication or private token scheme. It is possible to use organisational authentication mechanisms, such as single sign-on schemes or organisational ID, however, the findings from the interviews did not support these mechanisms, including due to the fear of being traced and an unwillingness to rely on organisational infrastructure. Therefore, when users want to access the system, they must first prove their affiliation with the organisation through the authentication form shown in Figure 11. In this study, this was achieved using an employee's work email address.

Figure 11. . The OurVoice authentication form, for validating users as being eligible (by way of organisational affiliation) to access the deployment in question.

After successful authentication, users receive a temporary link with the token that redirects them to the non-public part of the system. They receive a 'one-time-link' to their registered email (work email by default) to enable them to access the system. The link that the system sends is disassociated with the email address and is randomly generated at request time. They can read other participants messages and share their views by way of a response to existing messages (either

by replying to them, adding their own threads, or voting up/down posts). This authentication token stays valid for a limited time (configurable value) and can be used only once. The system stores a hashed whitelist of legitimate emails to validate membership. Every time the user tries to access the system, the users email address is checked through the same hash function [105] used for creating the whitelist, comparing the user-provided email with the whitelist entries.

A user's work email address was chosen as the initial mechanism for receiving the private temporal link and checking the validity of the users due to being the most common identifier of belonging to a particular organisation. Arguably, at work, an employer's IT department could access email accounts and thus know the timing of access to the system. For this reason, OurVoice gives an option of adding a non-work email that is not tied to the organisation, assuming that organisational IT Services cannot access it.

The potential risk of the organisation's IT department accessing the employee's email address is indicated by the system showing a pop-up message suggesting adding a non-work email as an alternative to work email. Despite the slight decrease in usability (due to the additional steps of adding non-work emails), the intention is again to provide more safety, creating a trustworthy environment. Ideally, the system would use work email addressed purely to check the user's validity without sending any information. It was decided that email would be used as an initial point of validating users to maintain a balance between security and usability. *OurVoice* does not have any information on the current user and what email they have and use. The only entity that is stored within the system is the session ID. This is a temporal entity that is valid only for an hour and allows users to access protected parts of the system. For the additional security these entities are stored in a separate system database with no connection to the main database that contains stored messages and can be accessed only by the Users' Backend Application shown in Figure 12.

All connections between the servers are established through virtual private networks and are encrypted. The only part accessible from the internet is the proxy that serves pages and requested data for users via the encrypted channel.

Overall, security is paramount for the whole system, especially for backend and API design and development [336]. Effective security helps to ensure the safety of users' interactions with the plan. Any data recorded by the system can be accessed only by the authorised users or by the system itself. All communication between different system parts was encrypted using JSON Web Tokens (JWT) for service-to-service authentication. Similarly, databases (PostgreSQL) that hold systems and users' data are also encrypted by the integrated mechanism of corresponding components. When the data is stored and processed by external services, a reasonable adjustment is made to ensure data integrity, confidentiality, and accessibility to appropriate users (e.g., S3 bucket encryption).
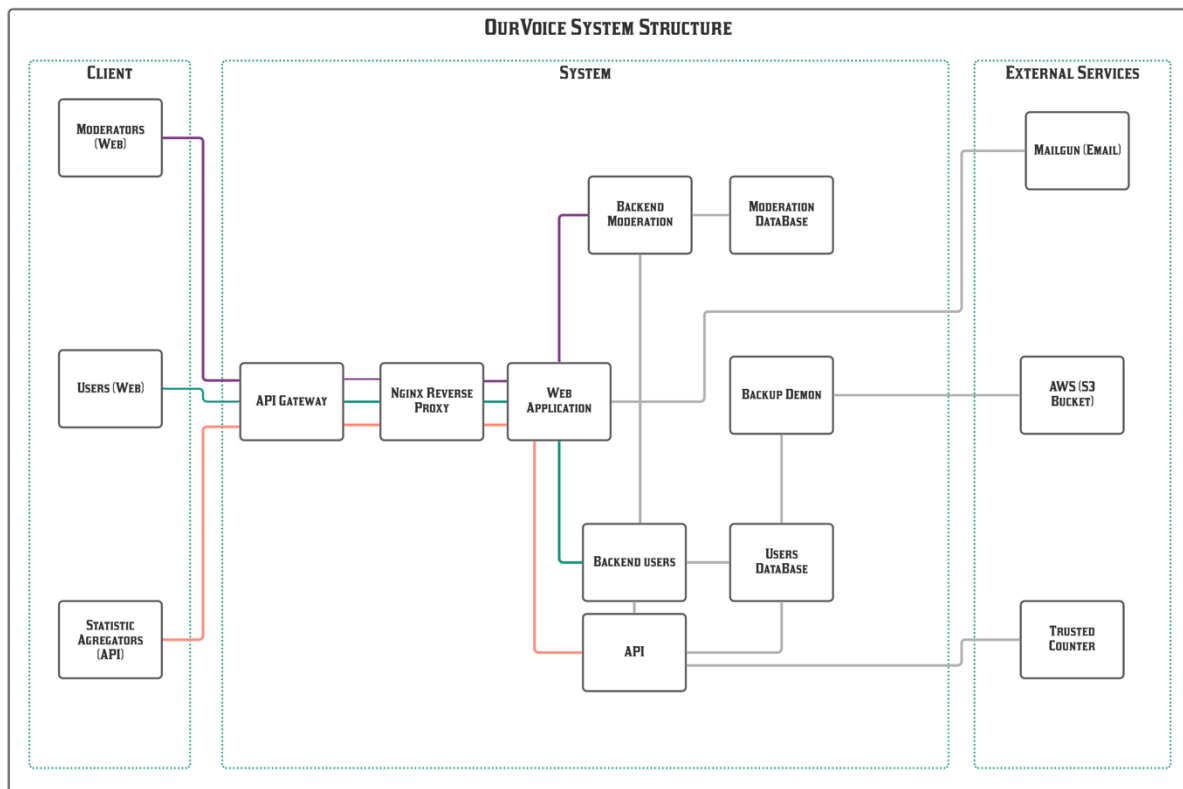
Figure 12. An overview of the OurVoice System Infrastructure and Architecture

The system represents an open-source digital platform developed as the web-based solution composed of five bespoke technological components (specifically designed for the system) and supplementary default components configured to work as a part of the *OurVoice,* as shown in Figure 12. One of the advantages of having a system made up of separate components is dividing and isolating (logically or technically) access to sensitive information. Thus, the moderators'

backend can be deployed as a separate virtual server or with the moderators' database but still isolated from the users' backend and database. Another advantage is that the system can be deployed partially or fully in the cloud environment if needed.

The *OurVoice* bespoke components are the following: *(i)* a Web Application that interacts as the frontend module with users and moderators allowing interaction with the system and information display (including authentication, creating posts and messages, voting and reading other's messages); *(ii)* a moderators' backend that processes input from the authenticated moderators through the Web Application to edit/delete/alter information in the moderators' database and publish approved messages into the users' database; *(iii)* a users' backend that processes inputs from the authenticated users and moderators through the Web Application and displays published post and comments from the users' database, allowing users to vote for it; *(iv)* a RESTful Application Programming Interface (API) that allows tokenised access to the users' database and statistics of the system usage, and *(v)* a Backup Demon that is responsible for nightly backups of the users' database to the backup data storage (Amazon S3 buckets).

In addition to the specifically developed bespoke components, OurVoice uses the following 'off-the-shelf' components:

(i)   NGINX proxy, an open-source, high-performance reverse-proxy and gateway [366] for traffic management between users and the system's external and internal components (Web Application, Backends, API).

(ii)   Moderators' database instantiated by PostgreSQL database [146] - a fast, reliable and scalable open-source relational database that hosts raw pre-moderated users' messages.

(iii)   Users' database instantiated by PostgreSQL database that hosts published approved messages and statistics about system usage.

(iv)   Session Storage instantiated by Mongo Db, a non-relational (document data model) database for storing users' sessions and cache for speed increase and separation of concerns.

(v)   To allow for scaling and the possibility of running several system instances (for different organisations) in one cloud infrastructure, all external traffic that arrives from the clients goes through the API gateway. In the case of this case study represented by Virtual Server with NGINX server (in gateway mode) [366] in the Digital Ocean Cloud) that lies between clients and service that forwards all requests to the correct instance of Web Application through reverse-proxy.

Moreover, the *OurVoice* system takes advantage of existing external services to shift some non-critical responsibilities to pre-existing services, rather than creating them from scratch. Thus, *OurVoice* uses Mailgun, an emailing and broadcasting service, to send temporary access tokens or confirm non-work email additions. Due to the modular implementation of the system, this service can be easily changed to any other existing service or can use a self-hosted email server (if ownership of all system components was critical for a specific deployment case). However, one of the advantages of using a well-established mail service is the problem-free delivery of emails (very few bounced or were detected as spam emails from the system Another advantage of the modular system and usage of an external well-established service is that the subscription for daily updates was implemented through the Mailgun mailing list functionality, without storing any subscriber emails in the system and thus adhering to the anonymity of the OurVoice. Amazon Web Services (AWS) S3 storage is used for nightly backup of the users' database. Just as with the emailing service, this service could be provided by any external and independent provider, from the main system server or a cloud storage provider. Finally, the last component that is intentionally developed externally is the Trusted Counter. An independent, trusted party receives information regarding some actions of unique anonymous users (based on hashes of their emails or session IDs for less specificity). These actions include creating posts, viewing discussion threads of the posts, creating comments and voting (only the act of voting, without the substance of the vote). These components are optional, and in the eyes of some users, can potentially compromise their trust and the perceived safety of *OurVoice*. Therefore, if these components are enabled,

a message is triggered in the FAQ that explicitly explains their usage, which actions are registered and the fact that it is enabled.

To mitigate the effect of the potential distrust towards the organisation-driven initiatives and neutralise the possibility of interference, the system can be distributed to deploy all three logical modules at different locations. For example, the users' backend can be deployed within the organisational premises (if the organisational security policy permits), while the frontend and moderators' backend (with raw, unmoderated data) is kept outside, to address the perceived fears of employees. In the case study, the system was structured and planned for deployment outside the organisational infrastructure. Essentially, the research team (consisting of the author and supervisory team, union representatives and leaders of the local union branch) acted as the trusted third party. Due to the presence of the trusted third party and the necessity of moderation, the database for storing pre-moderated messages (Moderator's Backend) was introduced and deployed on a separate virtual server outside the organisational infrastructure. All messages posted come to the temporal database before going to the system and being displayed to the users as in Figure 12 and through the moderation process shown in Figure 10. Thus, general non-moderator users of the system will not have access to pre-moderated messages. If necessary, it is possible to have separate web application servers for moderators and general users; the only connection point between the two parts of the system would be a channel for sending already moderated messages from the moderation subsystem to the users' equivalent. These arrangements were all designed to increase the system's security for better preserving the employees' anonymity and gaining their trust.

The system suggests having at least three moderators to mitigate the risk of biased moderation. There is no explicit requirement for diversity of moderators because it is highly dependent on the context in which the deployment is happening. However, the general rule would be that moderators will be familiar with the organisational context. For example, for the case study under consideration, it was decided to have at least three moderators (all union and department members when the deployment was carried out). Since the mock version, the moderation interface had been modified, so each post and comment

passed through the moderation process separately. If the message is accepted for posting by at least two out of three moderators during the moderation meeting, it will be queued for publishing in the system through the users' backend. Alternatively, the message can be edited to delete identifiable information, offensive language, or grammatical mistakes, or marked for deletion and then automatically deleted by the system. In the case of editing or deletion, moderators must provide a reason for this decision and type it into the special form on the moderation page, as presented in Figure 13.
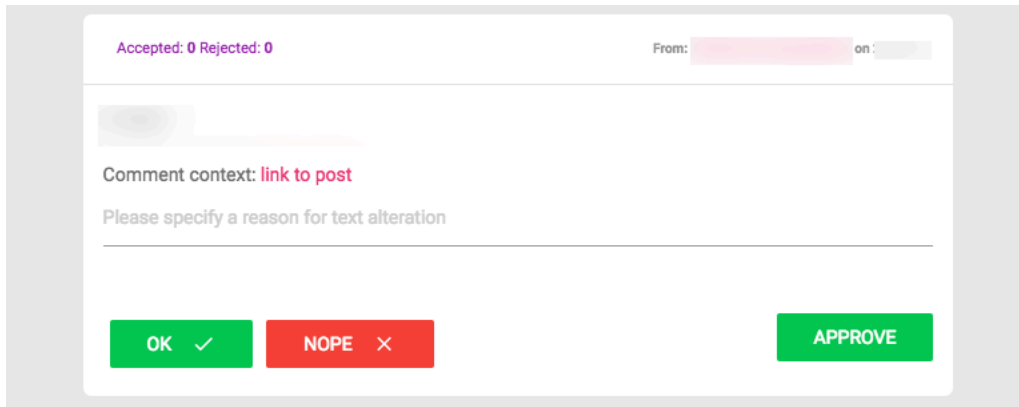
Figure 13. OurVoice Moderation of the message. This also enables the moderator to provide a brief reason for altering the text, where this was necessary.

A change in the slow posting approach was introduced to reduce the risk of abusive behaviour (according to *Adequate Slowness* design goal) and relax discussion. After moderation, instead of randomly assigning publishing time from 30 minutes to 3 hours during the test, it was decided to leave it as a configuration so the system can publish new comments and posts at specific times during the day. For example, the times chosen for the case study were 9am, 12am, and 5pm, to avoid distracting employees with instant messages and notifications during their workday. This slow posting arrangement aims to improve the system's anonymisation by eliminating the correlation between potentially observable user's interactions with the system and posts appearing in the system (*Safety*). Additionally, it helps reduce distractions during working hours by publishing only at the day's first and last working hours. One side effect was that it decreased the pace of interaction, inhibited 'flaming' (*Civility*), and helped prevent a hijacking of the discussion by more actively posting users (*Egalitarianism*). Overall, the system has a set of different configurable properties that are listed in Table 5.

Table 5. Configurable properties of OurVoice.

Configured Property	Description
Published times	Determines the frequency of publishing posts and messages by the moderators' backend application.
Number and list of moderators	Number of approved moderators in the system with the access list of authorised emails of moderators.
Number of required approvals	Required number of moderators to change a message's status to approved and send it to the publishing queue.
Hash function secret	Hash algorithm secret key that determines the output of the hash function and ability to validate users' emails during the authentication process.
API JWT secret	JSON Web Token secret key that is used in encryption and decryption of the token used in backend API to access system's data and statistics.
Initial categories	List of initial categories and their description that system has after the deployment.
Duration of the deployment	Length of the deployments that determines the time duration of the message publishing and ability to create and submit posts and comments by users.
Organisation branding and text	Icons, logos, organisation name and branding that can be used to provide a more familiar look for employees.
Theme and colour patterns	Colour patterns, fonts, and other style properties to make the system closer to the internal guidelines of the organisation.
Usage of trusted counter	Enables or Disables the Trusted counter component in the system. If enabled, sends specific information regarding the number of messages created by a unique anonymous user, discussion threads visited, and comments left.

Finally, in this second cycle of the case study described below, OurVoice was deployed on Digital Ocean Cloud infrastructure (outside the organisation's IT infrastructure) to more than 600 academic and professional employees within a UK university department. During this study, the research team (the author and his supervisory team) assessed the extent to which OurVoice met the design goals of facilitating high quality, civil, safe, egalitarian, and valid discussions.

5.4 Deployment (Act)

For this case study, the decision was taken to deploy the system within the specific university department. The deployment lasted for two weeks, with an additional week where the system was accessible for providing additional feedback. The deployment happened in a university academic department of 600 staff members and over 100 PhD students.

5.4.1 Context of Deployment

The decision to launch a two-week deployment of *OurVoice* was triggered by the movement of an entire academic department into a new building on a separate campus. The research team joined efforts with the academic trade union for the deployment of *OurVoice*, and the system went online for department members immediately after the move. The union has adopted the system as an official initiative to try a new approach in communication with their members and staff members outside their usual reach. In this cycle of the case study, the research team decided to collaborate with the local trade union branch to explore the applicability and efficiency of the digital tool in the unionised voice context, to understand whether it will make any difference.

While *OurVoice* was open for access to all staff members and research students within the department, in the beginning, the initial advertising of the platform was directed towards union members, with the call to invite non-union colleagues to participate and use the system. Given this context, the platform's focus was to discuss the positive and negative aspects of moving to the new building. However, users were free to make posts on any topic relevant to the work and the university.

5.4.2 Promoting OurVoice

The initial advertisement of the deployment involved two emails, one sent by the president of the local union branch to union members of the department and the other by the Postgraduate Research Students' representative to PhD students. The system was configured so that any staff member of the department or research student with a valid university email address had token-based access. However,

given that *OurVoice* was deployed on behalf of the trade union (that took the role of the trusted broker), it was initially disseminated to a union email list of members in the department, who were encouraged to share this promotion material with their non-union colleagues. With the further progress of the deployment, the research team also started to distribute physical posters around the department (including summaries of discussions from the system) and sent accompanying profile-raising emails using departmental mailing lists. These emails contained a link to *OurVoice* and described the system's functionality along with the reason for deployment. Another key element emphasised during this deployment was that neither union members nor non-union employees should feel pressured to participate. Due to this message and the fact that the system is anonymous by design, the research team could not know who took part in the deployment. Nevertheless, all emails still emphasised the anonymous and voluntary nature of participation.

5.4.3 Accessing OurVoice

Substantial care was taken to ensure that *OurVoice* operated as a realistically secure platform in which our participants could be confident in the system's privacy (the *Safety* principle). To this end, we used a 'token' based system (JWT). In the system, users have to enter their work email for verification on the website (the *Validity* principle). Work email is merely the method of delivery of the link to users. In this regard, the system has no way of knowing who clicked on the link and accessed the system. During this deployment, for those users who were concerned that the employer would detect the regular usage of the system by them, it provided them with the ability to change their validation email (for receiving tokens) from work to a private one. This could be done after the first validation.

5.4.4 Publishing posts and Comments on OurVoice

Employees who used a 'link' (token) to access the system were provided with the ability to submit a new post. At the beginning of the deployment, OurVoice was populated with the initial categories concerning the workplace environment and the move.. All messages (posts and comments) went directly to moderation before publishing, as shown in Figure 14. In this context, the choice of text-based only

communication helped to address potential privacy concerns of users, given that videos and images are difficult to anonymise. This choice allowed moderators to
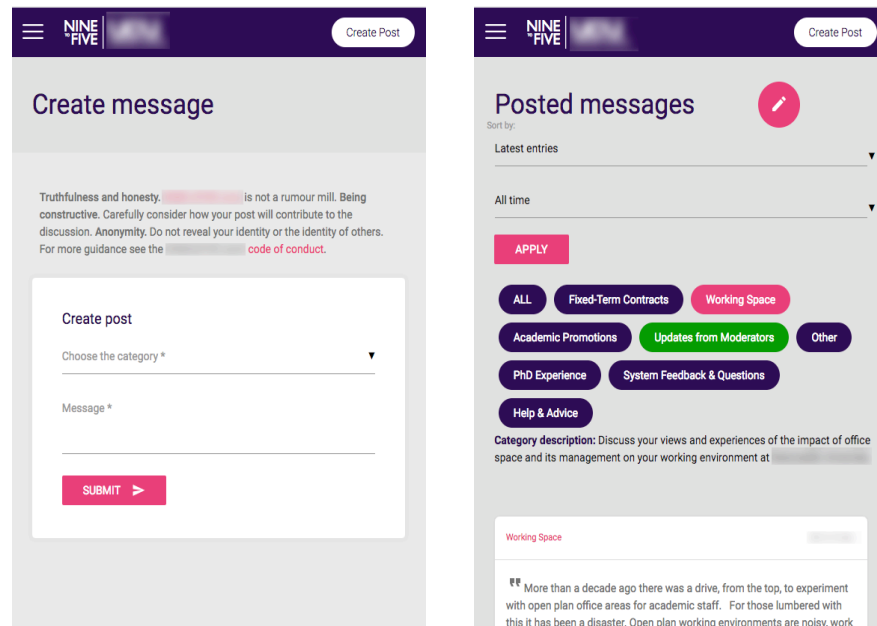
Figure 14. An illustration of the Post creation (left) and browsing functions within OurVoice.

respond consistently to different cases of self-disclosure or unintentional anonymity breaches (e.g., through minor edits to posts).

The system was configured to publish approved posts and comments in batches at 9am and 5pm, and each publishing was preceded by a formal moderation meeting. The main advantage from the moderators' perspective was the corresponding pragmatism of moderation: face-to-face moderation meetings used in this deployment only have to happen twice per day.

Despite the moderation and slow publishing arrangement, users were able to post, comment and vote when they wanted to. Voting of posts was used as a means of influencing discussion by providing the ability to sort the discussion by number of votes, comments, and most recent activity. As was suggested during the workshop, random usernames were generated for comments, which were generated and tied to the user's session (configured as it is for this deployment). These nicknames were intended to be fun and random (e.g., 'complex chestnut sheep') and provide an easy reference in the discussion thread to support the flow.

The system also displayed the time of the moderation session in which the post was approved (i.e., 'dd/mm/yy AM') for each published post to improve users'

navigation experience. In this deployment, each post could only be placed within one category and was filtered at the main browsing screen using standard search and filter tools, allowing users to discover the topics they found interesting effortlessly.

5.4.5 Moderating OurVoice

The moderation team for this cycle of the case study consisted of the members of the research team (who were also union members) and union representatives in the department. The moderation team consisted of six members involved in the moderation process throughout the deployment, with a minimum of three members (four on average) present at any given moderation meeting. During the design stage, moderators held face-to-face moderation sessions. These meetings took place twice a day, at 8am before 9am release and at 4pm before 5pm release. To safeguard against the risk of biased editing, everyone presents at the meeting had to approve each post and comment. A post required a clear case for either editing or removing by any of the moderators who decided to 'challenge' it. Thus, approval from the majority of moderators was enough for a post to qualify as publishable in the system.

Preserving the anonymity of both the author of a message (post or comment) and its subject was the main priority for the moderators during these meetings. Additionally, moderators were required to address potentially abusive messages and mitigate the risk of 'jigsaw' identification based on a particular author's typographical errors and/or idiosyncrasies. However, the code of conduct for moderators required them to keep a 'light touch' and not to correct every minor user mistake, so common typos stayed in messages. When a post or message had been edited, the system displayed a small 'moderated' tag next to it to enhance transparency. This adhered to the discourse *Safety* and *Civility* and was done to protect moderators' discussion from moderation and shaping. Thus, controversial posts got published if they conformed to the guidelines of the system. At the end of each meeting, moderators were required to summarise the moderation session that included popular or interesting posts and glimpses of the discussions based on submitted comments. The summary also provided information regarding the

reasons for modifying or rejecting messages (e.g., explanations and number of messages). Throughout the two weeks of active deployment, moderators rejected only three posts and four comments because of potentially self-identifiable information or language used. Three other messages were rejected due to an anonymity breach (based on the subject under discussion). In these cases, it was a unanimous decision by at least three moderators, made in cases where preserving the essence of the message meaning was deemed impossible without a breach of anonymity or where doing so required additional contextual knowledge moderators did not have. As mentioned in **Chapter 4**, on such occasions, the original (unmodified) message is permanently deleted, while the system only records the moderators' rationale for message modification/rejection. After the session, the summary and explanation for modification or rejection were posted under a dedicated category in the system. This helps to keep the sense of transparency in users' eyes, especially when they see a 'moderated' tag next to their post or comment [351] eventually supporting the *system's validity*.

5.5 Findings

At the end of this cycle, the collected data (qualitative and quantitative) was analysed. This section presents the descriptive statistics, first providing information on the OurVoice usage and a behaviour pattern during the two-week deployment period. The findings from the thematic analysis of the discussions in the system are then described [37] to understand the degree of support that OurVoice (as the employee voice tool) provides to the discourse principles identified in **Chapter 4**. During the analysis, all of the discussion threads and comments were annotated to determine the connection between the messages and explore the relationship between the principles and design goals for digital tools and the content of the discussion, if any.

5.5.1 Activity Patterns

The publication time for the posts and comments were set at the beginning and the end of the workday. As perhaps expected, most interactions with the system happened around that time. For instance, new comments under the existing threads were mostly submitted immediately after the release window of the latest

batch (9am or 5pm). In contrast, posts on new topics were more evenly spread throughout the day. This suggests that users submitted them as they faced issues or ideas that arose. The data in Figure 15 shows that staff was mostly active between 9am, and 11am, after arriving at the workplace after releasing the first batch of messages.
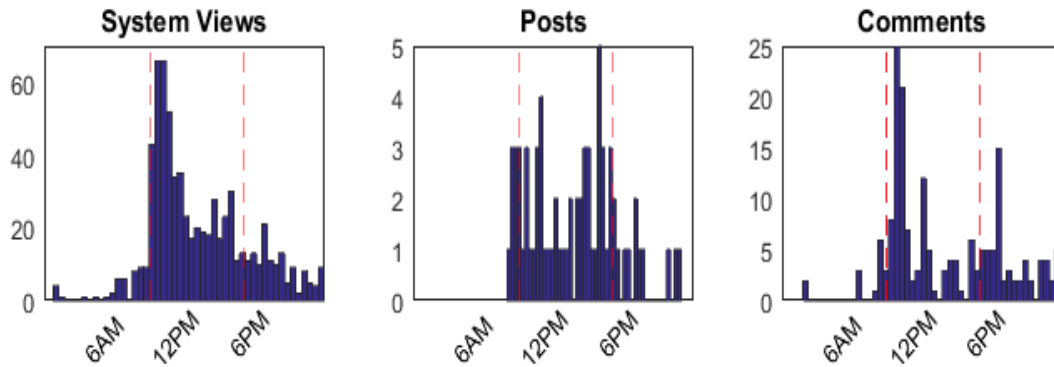
Figure 15. Activity levels observed on the OurVoice system during the two-week deployment. The red lines indicate the times when posts and comments were released.

Figure 15 also depicts the number of posts and comments users have submitted for moderation during this period. Although there was a natural drop-off in messages submitted along with the deployment progression (as novelty effect faded away), a reasonable level of activity was sustained over the whole deployment to the end.

In this light, a more interesting observation is that the number of views on the system during the first and second half of the deployment (second week) are comparable (see Figure 16). This indicates that despite the decrease in posting towards the end, employees kept checking the discussions in the system until the deployment. The only exception is the holiday weekend at the end of the first week of deployment, which accounts for the noticeable dip in activity.
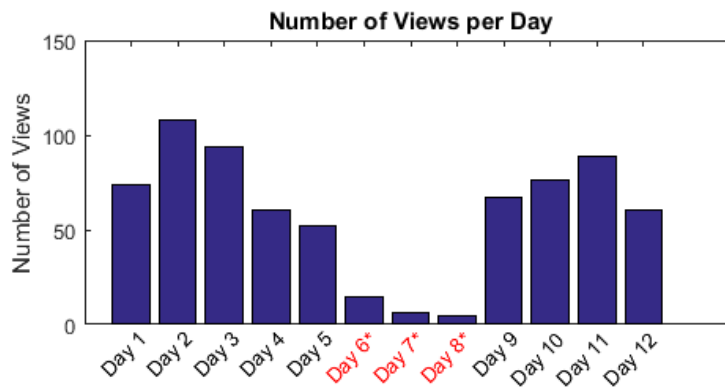
Figure 16. Engagement levels (system views) observed on the system during the two–week deployment. Days 6–8 (in red text) were not working days.

The overall ratio of the number of employees in the department to all unique users of the system is 144 to 604 (24%). In addition to the relative consistency of contributions throughout the deployment period, the data allowed for an evaluation of the type of conversations on the platform: sustained conversations or one-off posts (mostly complaints). As can be seen in Figure 17, there were many posts where the sustained discussion took place. Thus, 15 posts received comments over three or more days (40.5%), and 22 posts received three or more comments overall (59.4%). Overall, the system had 36 posts and 149 comments.
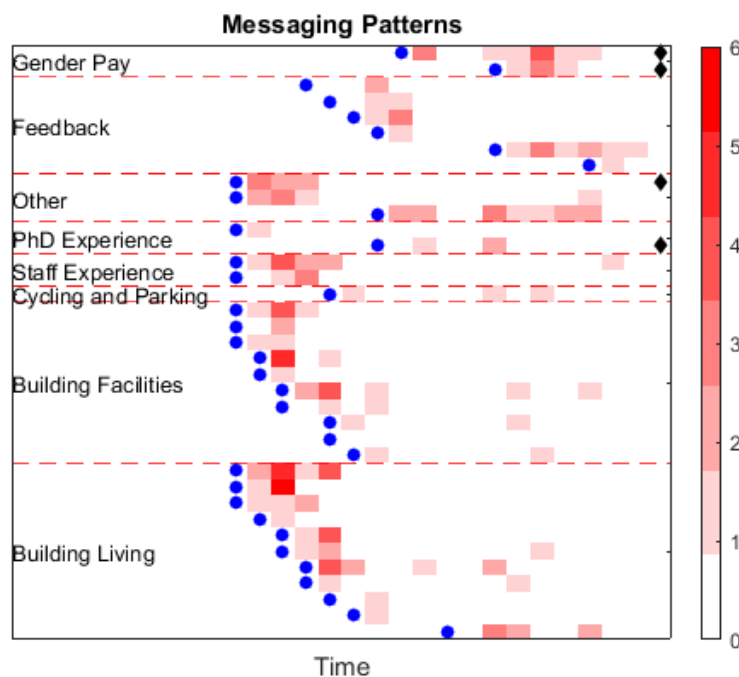
Figure 17. Posting patterns on OurVoice, grouped by topic of discussion. Blue markers represent posts, while red coloured squares represent the number of comments released in a moderation meeting.

Moreover, posts with three or more comments on average had 5.75 votes, whereas posts with less than three comments had on average 2.9 votes. Given that

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'flaming' comments would not pass moderation, this is a good indication of the quality of discussion within the system. Indeed, previous work [307] showed how discussions that focus on specific issues at a deeper level were perceived as high-quality and rated more highly, contributing to the notion of support for the constructive and civil discussions on OurVoice. However, it is worth mentioning that there were other threads with little or no reaction and no comments.

5.5.2 Civility, Candour and Robustness

The important consideration in OurVoice, as with any other anonymous system, is the quality of discussion and behaviour of users encouraged by the system due to its design goals and principles. Indeed, as was shown by previous research, the constructiveness and politeness of a conversation play an important role in the ability of a team or community to sustain discussion and eventually reach a point of agreement [263,275]. The analysis identified a total of nine threads (posts and/or comments) that contained 17 cases of impoliteness, including one thread with four cases. This deployment had 23 uncivil entries (12.4%) out of 185 entries. Additionally, other entries that were modified included: nine due to typos and grammatical mistakes, six due to formatting issues and six to provide additional clarification. There was only one 'clear' (as agreed by moderators) case of an uncivil entry, that as a comment, did not contribute to the discussion (on gender pay inequality) and was considered impolite:

SDP: *"Well this was clearly written by a man."*

Vulgarity, rudeness, or implied stereotypes were the reason entries were identified as uncivil by moderators, rather than abusive or aggressive content. During the deployment, moderators adopted a liberal approach, opting not to alter messages that might look controversial but were not explicitly uncivil or rude. That led to a questioning of the moderators' code of conduct by some of the users. For instance, the discussion of noisy open-plan offices provoked one of the users to suggest job change as the alternative to complaining about the workplace. Other users picked this up as the starting point of questioning moderation.

This cycle identified two key discussion patterns: *(i)* the divulging of personal experiences and *(ii)* confrontational points of view. The first pattern was common in most threads (29/36). For example, this was provided by a user regarding gender pay inequality:

> *CCS: "Yes I didn't used to think this is needed (for all sorts of reasons) but my recent observations on how male recruits at the University (even at junior levels) are allowed to negotiate starting salaries while female recruits are told "that's the level like it or lump it!" has changed my mind.'*

Generally, commenting users did not hesitate to show their (dis)agreement with other peers, although this led to uncivil responses on some occasions, especially in 'impolite' threads. Nevertheless, even these discussions returned to a constructive flow after few rounds of comments. Discussions were frank and open with users sharing some clear conflicting points of view but also being willing to engage in debates, especially in 'gender pay and Justice' or 'Building Living' threads.

> *KUR: 'This is a tad vague. I'm curious as to what the OP thinks is a discriminatory practice, the fact that they might think one or two men have been treated better than them doesn't mean there is actual discrimination'*

Overall, findings from this cycle did not indicate any obvious disadvantages to discussion flow or continuity arising as a by-product of the *Anonymity* or *Slowness*. Despite the evidence of heated debate (which is good by itself), stable participation is demonstrated throughout the deployment. The only concern on some occasions was the moderation, although it can be argued that robustness and the presence of different views are essential for workplace conversation of this type.

5.5.3 Establishing Employee Voice

5.5.3.1 *Workplace Experience and Discrimination*

Gender pay inequality and organisational justice, in general, were the major discussion topics, along with the threads about equal opportunities and workplace discrimination. This topic included 26 comments across four threads (30 messages

in total, or 16.2% of all conversations), incorporating some sensitive discussions that emphasised the importance of Anonymity as the system property. Towards the end of the deployment, the initial debate on the gender pay gap was reinforced by new threads around gender discrimination and allegations:

> UVW: 'my supervisor used to call for demonstrators, mail only to his male students and completely ignoring female students as if female students are not capable of demonstrating!'

In these threads employees would raise their concerns, backed by personal experiences that were later supported by their colleagues' evidence or were questioned by others commenting.

> UPH: '@uvw that sounds like an obvious case of discrimination (which you might want to raise with the Union), ...'

This shows the potential tension between, on one hand, ensuring the anonymity of the individuals, and on the other, allowing richer data collection (as an alternative to the text). One approach could be allowing different forms of evidence, such as posting documents or recordings (anonymised). The lack of the system's affordances to start a collaborative effort to address such issues became apparent, for instance, by the inability of the system to send notifications or produce reports for management for further consideration, especially regarding the concerns that contravene employment law. The discussion about transparency in the workplace generated some explicit calls for cooperative action: 'The biggest failure is a lack of transparency—appointments and promotions seem based more on patronage, rather than merit' (ALS), while others concluded that there should be more openness regarding payments and finance. Thus, pay disparity was considered a significant issue resulting in a large number of posts. This was supplemented with the lively discussions around work/life balance.

> USS: "I think the work/life balance is bad for so many Phd students ... We need to stop boasting about how much time we spend on our work and discourage an environment where people work into the early hours of the morning to get things done it's not sustainable"

Overall, these examples show the evolutionary nature of the discussions: one claim about discrimination or unfairness brought other complaints, not always on

the same topic. This stemmed out from the collection of a variety of different complaints as well as their collation in ways not exposed by other means [352]. Eventually, these complaints helped address sensitive issues that employees in other scenarios do not often use voice. Ultimately *OurVoice's Anonymity* and *Moderation* supported participants in speaking up regarding these topics while ensuring the *Safety* and *Egalitarianism* of their voices; indeed, a recent workplace survey showed that more than 50% of respondents witnessed discrimination at work, and less than 20% reported it [131]. Through these discussions on an employee voice system, employees improve the chance of these issues being reported and dealt with, or raise overall awareness of existing problems.

Lastly, one group of employees used the system as a tool for social affirmation. Previous research in the health domain [355] has shown the benefits of such social affirmation, where sharing sensitive health data over the eHealth platforms positively affects users' mental state. In the workplace environment the social affirmation need might be based on fear of potential reprisals if shared through the existing communication channels and ESNs with a visible identity. Such systems as OurVoice show the ability to accommodate such peer-to-peer support mechanisms while preserving privacy and emphasising the crucial role of the mechanisms' permanence and sustainability.

5.5.3.2 *Taking Things Offline and Responses to the System*

One goal of this deployment was to support employees in voicing any concerns around the move to a new building and supporting any coordinated action that might make that move more successful. As the deployment coincided with our department's move, several posts were about issues that were arising due to the move. These issues did not result in much subsequent posting, potentially because many were not easily remedied given that those staff members responsible for estates were not active participants on this particular deployment. The implications for designing systems for employee voice that include (or exclude) specific communities of practice are to configure the actionability of the issues raised. Questions arise on how can matters be taken offline to trigger action and adhere to *efficacy*.

Other posts were more successful in generating action. For example, one of the participants suggested scheduling a yoga class as part of the well-being classes, which emerged from a discussion on the system that was followed by meeting offline, facilitated by one of the moderators and their voluntary de-anonymisation:

> *VSC: 'yes yes yes! Let's do it! @weary tangerine armadillo if you can find out costs more of less then we could take it from there!'*

This example shows how *OurVoice* by itself, a standalone system designed to facilitate employee voice, fails to facilitate the subsequent activities necessary to organise a successful coordinated action (i.e., for the well-being case, the online form and the collaborative writing of a proposal to organise it at the department level).

Another set of posts addressed the whereabouts of good local restaurants. Users were keen to share their local knowledge, initially on the platform, and voiced their willingness to work together to help small local businesses. The suggestions were coordinated with the help of a department administrator (also a user of the system), and a local food map was created and distributed around the new building in the form of leaflets and posters, and a digital version was made available for further distribution. These cases showed how the chosen design of the system as a shared environment for people with a common field of work helps to bring various opinions in place and ignite coordinated actions and collaborations. However, in this instance, we can see how some issues required the participation of, and coordination from, employees with specific expertise (i.e., administrator) and how the form of communication on *OurVoice*, which was text-based, can prove limiting for certain categories of issues. The wider consideration was described within this discussion that questioned universal applicability of anonymity on some occasions:

> *SDR: "good work! Let's take this forward. Now, how do we get "out" of this platform and get something done. Clearly anonymity has its limitations. and it looks like we are far more interested to make stuff happen in here than just it being a talking shop."*

Finally, the research team found out that not all staff members within the building had access to the system. Research team members noticed the estates' staff members having a discussion over the printed outposts from the system in the morning (Figure 18):
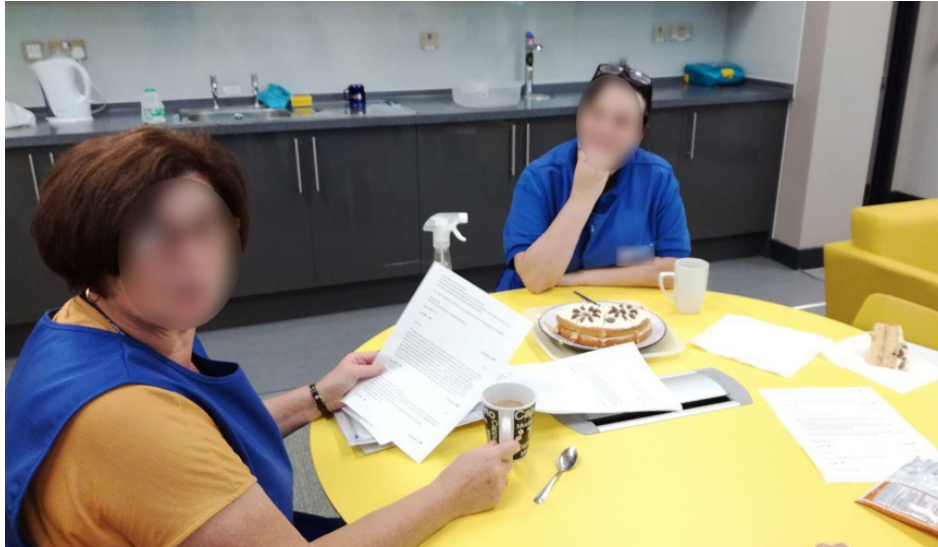
Figure 18. Offline interaction with OurVoice by the building's cleaners.

They could not authenticate in the system since their emails were not whitelisted at the beginning (an issue I immediately rectified), so they asked someone who had access to print out the posts from the system. This suggests that the realisation of the Control Access principle of the system could be refined and indicates the correctness of the decision for implementation of pre-moderation.

In this light, the legitimacy of the moderation process was a concern for users, resulting in feedback received regarding different issues around it, including the rotation of moderators, transparency of their work and whether their positions and names be made public or not.

> *"The moderation is totally non-transparent. What posts or comments I am confident to submit depends on my knowledge on who is moderating it. How does one become a moderator anyway?..."*

5.6 Discussion (Reflect)

In this section, I discuss the implications of the design decisions that have been implemented in *OurVoice*, in conjunction with the findings from the two-week deployment. The design goals and principles influenced the flow of discussion and

reflected on whether it effectively supported employee voice. OurVoice deployment was effective because it was able to successfully recruit and empower employees who were prepared to speak out on important issues and reach out to peers to coordinate action around the move to the new building. The volume and diversity of topics discussed were encouraging, and some of the more controversial issues promoted a sustained discussion.

As was shown in the previous subsection, discussion of discrimination and social justice made up nearly a quarter of messages in the system. It demonstrated the ability of *OurVoice* to sustain open, candid, and effective discussions on sensitive topics that may otherwise be hidden. From the perspective of those who chose to post, it demonstrates a substantial degree of trust in the system ability to protect their privacy and support voicing. For them, these comments could have had negative consequences if posted under their names, such as clear claims of discrimination and overwork on the part of their line managers or academic supervisors. However, there are recognisable limitations of the system, notably that voicing by itself does not guarantee appropriate actioning on issues identified.

Thus, subsections below depict the questions of balancing results of design goals for the system, its effectiveness in employee voice agenda and limitations around subsequent actions.

5.6.1 Balancing Anonymity, Slowness and Moderation

5.6.1.1 *Anonymity*

As this thesis has previously discussed, a positive effect of anonymity is its ability to support employees in voicing their concerns and speak about sensitive issues without fear of repercussions. Nevertheless, it can also be a barrier when it comes to effective actioning on issues identified. Additionally, the anonymity of a claim might weaken its significance. As a result, the design of an effective employee empowerment system needs the mechanism to cope with these negative properties. This would require very careful identity management practices and would likely make the moderation process more challenging. Even though our deployment did not show any practical disadvantages of facilitating employee voice, it was evident that the anonymity of the posts tends to raise the level of

scepticism from management. Thus, mechanisms for coping with the potentially negative effects of anonymity could be realised by providing different levels of privacy in the system. For example, they can include full anonymity, partial anonymity and, maybe, full identity disclosure. A more likely scenario, particularly in respect of coordinated action, is to design a support structure in which participants can identify themselves in small and closed groups and engage in follow-up actions (e.g., a well-being classes subgroup). In this deployment, the transition to actions is supposed to be facilitated through the involvement of the labour union branch and respective members that would take up complaints. However, they were hindered by the absence of actionable evidence for many of the claims being made.

Preferably, if a claim regarding discrimination is raised through *OurVoice*, a trusted third party (human resources department or a labour union) should have the ability to pursue this, either based on the anonymous post or by contacting the user who has raised the issue; this is not provisioned by the system by itself. This also raises the question of whether staff roles should be recognised in the system. Based on the findings, we can conclude that even though it is evident that *Anonymity* does facilitate constructive and frank discussions, without any clear disruption to the flow of discourse or civility, it would be better if it was accompanied by a process that helps to act upon the raised issues, if necessary. It may be better to avoid making a simple binary choice between total anonymity and full identity disclosure and instead recognise a spectrum of possible configurations that might improve the capacity to coordinate effective and sustained action between and across communities of practice.

5.6.1.2 *Slowness*

The findings have shown that most users' activity in the system happened over the working week and during the working day, while a majority of activity was grouped around the first two morning hours and did not impact the productivity of employees throughout the day. That agreed with the previous research that indicates that attention switching during the day negatively affects workers productivity [229]. Thereby, morning activity spikes, along with the limited

release of messages twice per day (*Adequate slowness* design goal), limited the possibility of attention switching. In light of this and the initial assumption that *Slowness* can assist with tempering the potentially 'flaming' and aggression-prone nature of an anonymous system, one can conclude that this design decision was an adequate response. However, the real-world nature of this cycle and corresponding lack of rigorous means of control does prevent the making of a stronger claim regarding the level of its impact. Analysis of threads' discourse has not detected discussion shifting or spreading out and dissipating; rather, some degree of discussion deterioration and decay of discourse continuation occurred closer to the end of deployment, and earlier in cases where a resolution was reached.

Additionally, the smaller engagement spike at the end of the day (5pm release window) suggested that this is not crucial for discussion continuation, indicating that the improvement for system effect can be reached by more careful selection of publishing time. This is especially relevant for less structured contexts, such as deployments in remote and distributed workplace environments. An alternative view on design goal implementation might be necessary (e.g., different pace and timing for delays).

5.6.1.3 *Moderation*

This deployment has shown that the design decisions implemented in *OurVoice* around careful moderation led to a constructive and frank discussion in opposition to other anonymous platforms and ESNs [139,166,209,291]. This does not contradict previous research that examined the effect of the pre-moderation in online forums and showed that it leads to higher quality discussions [351] and fewer threatening posts [29]. The activity patterns in these cycles have not shown any indicators of the negative influence of moderation, such as interruption of the discourse flow or the influence of discussions by moderators. However, it questions the scalability of the system and approach in general due to the required effort of achieving this degree of moderation (e.g., the necessity of having daily face-to-face meetings). This led to the idea of more flexible and less time-consuming moderation arrangements in the subsequent cycle. Generally, for any similar

employee voice system, it would be critical to organise a more efficient moderation process pipeline, which could be achieved through the utilisation of *(i)* remote moderation meetings; *(ii)* fully asynchronous moderation; (iii) introduction of official moderator accounts that can post messages when appropriate, and (iv) the production of more detailed guidelines for moderation, along with the guidelines for users regarding civil discourse. These moderation pipeline considerations manifests through the users' concerns regarding the transparency of moderation, and is an ongoing concern for all involved parties, and remains a problem in the context of online communities [265,284]. Thus, previous research indicates that the moderation process has to be transparent to avoid an environment of distrust and fear [351]. The moderators' attempts to keep users informed of each moderation session's outcomes by sending out and posting summaries and statistics on how many posts were edited/rejected and why [170] were clearly not sufficient to satisfy users' transparency criteria. The subsequent cycle (Cycle 3) in this study explores this aspect through the alternative methods of communication to support continued user engagement.

Moderation can also play a role in shaping the discussion. In this deployment, the moderation process was effective enough to avoid an inflammatory argument, but we would query the team's composition. The moderation team comprised individuals who were members of the research team and the labour union. For future deployments or similar systems, the moderation process could be open to any member of a community of practice. Additionally, the role of the moderation team could be expanded to support the orchestration of coordinated action and helping to make the links between issues, outcomes, and anonymous contributors. This means that the initiators of the employee voice process or deployment have to be careful to prevent the moderation process from interfering with the direction of conversations.

5.6.2 Facilitating Effective Employee Voice

This deployment resulted in various voices [98,256] and multiple discussions, thereby showing the relevance of the identified design principles and goals and their applicability for supporting the establishment of employee voice. OurVoice

efficiently facilitated employee voice throughout this two-week period, generating constructive discussions around the issues that were otherwise perceived as challenging and unlikely to be openly discussed outside the trustful and safe environment. This feeling of safety was evident during the deployment through the sustained diversity of discussions around sensitive and controversial topics. This suggested that employees had a reasonable degree of trust in the system, as they chose to post despite the potentially negative consequences of some of the posts and comments, such as the explicit claims of discrimination or overwork from the discussions in the 'gender pay' and 'Workplace Experience' categories.

The key point in the facilitation of the voice is that OurVoice allowed employees to express specific complaints of discrimination experiences they had, which can help their peers become aware of this and enable unions (project teams or managers) to act on the complaints. Surveys or one-way feedback are not effective in these matters [1,262,298]. Even though this deployment has shown that some people overcame their perceived fears and feeling of futility (discussed in **Chapter 2**), and expressed genuine grievances, it is worth mentioning that the system by itself does not automatically guarantee that appropriate responses and actions will be taken.

5.6.3 Revisiting Employment and Rethinking Enrolment

Another aspect revealed by the findings is the natural limitation of the approach was that our design activities focused on, partly due to our partnership with the labour union, academics, professional and research department members. This left some of the staff that were physically co-located in the same building outside the scope of the system due to their externality to the department or simply because they were not within the union or did not have email addresses associated with the university. For instance, central services staff (e.g., building managers) who were not associated with any specific department or members of the labour union were not recognised as employees during the system configuration were excluded from the system. In this regard, universities, like any other large organisations, have complex employment relationships with different staff members (e.g., those who are directly employed or those who are subcontracted)

that cannot always be easily captured. Moreover, other relative concepts do not always imply direct employment despite a close relationship with the organisation or specific business unit (e.g., member, business partner, service provider). While this deployment attempted to tackle these issues through the multi-channel approach for enrolment and promotion, it brought to the surface the complexity of the endeavour and the importance of having a correct and inclusive enrolment process. In practice, designing for *Validity* and *Egalitarianism* is a more challenging task than was initially predicted. A more comprehensive planning and design process is needed to account for engagement with a wider group of stakeholders, including a range of different relevant labour unions, non-unionised members, and subcontractors. Overall, this highlights a continuous facet of the employee voice as a process that requires more extensive consultation with employees 'on the ground' and the identification of relevant stakeholders.

5.6.4 Acting on Issues Raised

Finally, one aspect revealed by this cycle is that such a deployment requires further investigation on how it can inform and configure actionable outcomes [18,50]. The *OurVoice* deployment resulted in specific actions and initiatives, including well-being classes, a local food map and resolution of some infrastructure issues. More noticeably, the uncontentious nature of these initiatives allowed involved employees to shift these activities offline or to deliver changes through the conventional channels (e.g., department mailing lists). However, more concrete collective actions (self-organised or otherwise) regarding contentious issues are harder to reach when the employee voice does not represent a process of a more subsequent nature. Does this raise a few questions of how an anonymous user of *OurVoice* (or any other digital system that adheres to the design principles and goals) might subsequently become a contributor and a recognised actor? How can the employee voice process be effectively supported and embedded in the organisational decision-making to facilitate its continuous nature?

In this regard, participants of this cycle explicitly requested that the evidence from the deployment be considered by senior managers for informing department

practices and policies. This reflects the friendly and efficient provision of accountable data from the system usage and its content, including potential recommendations for follow-up activities (Town Hall meetings, project teams or workshops based on such data), as well as a design consideration for more generalised guidelines for an employee voice process that incorporates OurVoice and leverages its characteristics. One potential development could be including an AR approach through the agile and flexible approach of planning (*Plan*), deployment (*Act*), analysis and action (*Reflect*) stages.

One of the limitations of the evaluation of this cycle was the inability to obtain feedback from participants. Specifically, the research team simply could not know who participated, making it impossible to do face-to-face or email follow-ups of those who did without explicitly asking people to declare their involvement. Further, there was a risk that staff members might 'de-anonymise' their contributions in any post-deployment interviews, and the author wanted to avoid this. However, the next cycle will describe the subsequent deployment where this issue was addressed.

As with most new, bespoke systems, a key challenge the research team experienced was sustaining staff interest throughout the deployment period. The effect of periodic reminders (email broadcasts with the summary of the moderation session) on user participation is unclear. Still, perhaps the intensive awareness campaigns may not be necessary when deploying for time-limited durations. One of the configuration considerations to increase the value of the deployment is to introduce it for a limited time and focus on a set of main issues while still providing employees with the ability to leave messages regarding other concerns. Alternatively, there might be a more active means for 'restarting' the community and discussions within them (e.g., by seeding them with posts or issues).

5.7 Conclusion

This chapter explored how a *OurVoice* can support employee voice and faciliate horizontal peer-to-peer channels within an organisation. Within this cycle (Cycle 2) of Case Study 1 I operationalise the qualities of *Civility, Validity, Safety* and *Egalitarianism* in realising the design goals of *Assured Anonymity, Constructive*

Moderation, Adequate Slowness and *Controlled Access*. I showed how the deployment of *OurVoice* led to a range of candid discussions around critical workplace issues, and led to minor, but concrete, changes within the host organisation. I identified considerations and limitations pertaining to the employee voice process.

Overall, the contribution of the first two cycles of this study, described in **Chapter 4** and **Chapter 5,** is threefold: *(i)* identification of facilitators and inhibitors for voice within the workplace and a corresponding set of appropriate qualities; *(ii)* operationalisation of these qualities as both a set of design goals for an employee voice system and an ESN-type system that was designed and fully implemented; and *(iii)* real-world deployment and evaluation of the developed system to show how a combination of trusted anonymity and 'slowed' moderation can foster employee voice.

Chapter 6 Case Study 1: Employee Voice Process, Embedding and Continuity (Cycle 3)

6.1 Introduction

In this chapter I describe the third and final cycle of this case study which explores the process of embedding employee voice within a university workplace. Through an AR activity, initiated in response to an industry-wide crisis in educational service delivery, *OurVoice* was deployed as part of a three-month management-initiated but employee-led (sessional[6]) engagement, that allowed an examination of the intricacies of *embedding* employee voice. This explored issues ranging from the bottom-up formulation of workplace problems by staff, to integrating recommendations within the organisation's education strategy. It is not new for HCI research on employee voice to focus on constructing a technological solution to address the challenge of speaking up in the workplace (see **Chapter 4** and **Chapter 5**). However, the challenge of successfully embedding employee voice systems and processes requires designers to engage with the culture and power dynamics of actual workplaces. Thus, in this cycle, I highlight three additional design considerations for an employee voice system – *progression assurance, bounded accountability* and *bias reflexivity* – that serve to facilitate embedding employee voice within an organisation.

Previous works [1,110,342] have demonstrated the capacity of different systems and approaches for supporting candid conversations and facilitating

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[6] Sessional staff members (or sessionals) are the staff members employed to teach on a session-by-session basis, in any capacity and at any level across the university [281]. In a more general sense, this describes people who do **not** have permanent positions within the organisation. They are employed either for specific duration (fixed-term or casual employment) or paid by the hour without a minimum salary in the contract (zero-hour contracts). Sessionals are usually responsible for delivering worksho and tutorial sessions, marking assignments and supporting lecturers throughout the semester, including creating teaching plans and designing the module/unit.

employee voice [330], However, these studies have not demonstrated the role of employee voice in successfully instantiating organisational change. The goal of this cycle was to understand how an *end-to-end* Employee Voice Process (EVP) could be successfully embedded within an organisation. In this context 'Process', in EVP, refers to a lasting, sustained and repeatable employee voice activity (e.g., workplace meeting or *OurVoice* deployment). The focus of this cycle is on the role of different parties, the importance and nature of trust, and employee perceptions of the validity of the process. My primary concerns are: (i) how contextual factors and interactions between existing organisational actors influence the EVP; and (ii) the actions we can take to ensure the successful (and sustainable) embedment of the EVP.

6.2 Motivation and Background (Plan)

Unlike the first two cycles, the third cycle in this case study focuses on the peculiarity of the context and workplace environment in which the employee voice supporting system is deployed. This section of the thesis describes some of the relevant concepts around the workplace environment and organisational culture that might affect the effectiveness of the *OurVoice* deployment and EVP associated with it.

6.2.1 Workplace Environment

As **Chapter 5** demonstrates, successfully putting employee voice into practice requires creating a trusted and comfortable environment for members of the workplace community to share their suggestions and issues. Generally speaking, employee voice is a broad concept that concerns both tangible aspects of the work environment (e.g., policies and physical working conditions) and more subtle work-related practices that make up the wider organisational culture [1,110]. These infer the prolonged and sustainable presence of the mechanism of the voice within the organisation. In practice, employee voice can be directed through a range of different mechanisms. These mechanisms can be divided into two overarching categories: formal and informal [190,227], implying orchestration by the different principles of work communication through direct and non-hierarchical or hierarchical and structured channels. Formal approaches tend to be management-

directed, meaning they hold implicit advantages of being more tightly ingrained into the organisational structure [270] and more closely aligned with the organisation's existing processes [256]. Thus, higher management are more likely to be receptive to such channels [161]. In **Chapter 5**, the unionised and informal approach was taken as the means for employee voice, showing the contrast of expressing ideas and concerns directly and outside the existing organisational structure [1,190]. To this end, formal EVP are often considered vertical and instantiated by the relationship between staff members and management above them in the organisational hierarchy (with this hierarchy characterising the process).

Conversely, informal processes tend to be characterised as horizontal due to operating mainly between peers at the same level in the organisation or without connection to existing hierarchy, and often within the same team [150,227,256]. The previous cycle identified the limitations of the detached employee voice initiative and raised the possibility of implementation of a compelling informal EVP through secure and trusted channels (*OurVoice*). This cycle addresses the possibility of mixing some formal approaches (managers' receptivity and involvement) into the informal process. Thus, the result is retaining the benefits of informal voicing (e.g., higher affordability and perceived suitability for personal issues [256]) while adding formal structural components into the process.

6.2.2 Transactional Versus Relational Culture and the Context of Casualisation

It is helpful to explore the connection between the organisational culture and workplace environment deemed necessary since employee voice takes place within a given organisational context and culture [161,298]. Organisational culture directly affects employees' perception of other colleagues, their perceived position and ability to influence the process, and decisions taken within the organisation [111,335].

Some organisational cultures can be characterised as hierarchical and systematic, while others are more flexible and interconnected. Denison and Gretchen identified four types of organisational cultures: *(i)* developmental

culture, *(ii)* rational culture, *(iii)* hierarchical culture and (iv) group culture [78]. Organisations can be placed onto two axes, ranging from internally focused with controlling or strictly following procedures (rational and hierarchical) to those that are more externally focused and show a growing or developing group culture. Similarly, other researchers identified four types of organisations (Clan, Adhocracy, Hierarchy and Market) that they categorised based on the ways information is processed and analysed, which influenced the management style and decision-making within the organisation [302]. Thus, two broader categories of organisations can be identified based on culture and communication norms: (i) transactional, where the actions are usually undertaken in a top-down manner from managers to employees to meet perceived needs and expectations of employees; and (ii) relational, where employees and managers make decisions together and commit to delivering them [245,297]. Such issues of organisational culture can directly affect EVP and employees' active engagement in response [144,239], which can influence employees' commitment and job satisfaction [22,111]. Organisational culture can also directly influence how a modern workplace might respond to pressures of increasing casualisation and employment precarity [23,40,60]. These issues affect around 25% of the workforce [137].

The last cycle of this case study took place in the higher education setting, where the organisational context is inherently transactional and where casualisation is a particular concern [40,60]. Previous research has explored the impact of sessional tutoring arrangements on the quality of teaching [70,280], staff retention and student retention [173]. The casualised nature of the work done by sessional staff members has been shown to decrease tutors' job satisfaction and negatively affects their work-life balance [60,281]. These fixed-term employment arrangements also mean that the members of staff who often play the most crucial roles in the student experience are discouraged from active participation in employee voice mechanisms

6.2.3 Employee Voice Mechanisms, ESN's and Organisational Impact

EVPs can only be realised when an organisation's perceived and actual power relationships are understood, and the chilling effect that they can have on employee voice, and trust in that voice, is accounted for. This means that any process designed for support of employee voice should provide both a means of protecting the individual while also assuring management that those expressing concerns are genuinely seeking to contribute to the organisation's good and not exploiting anonymity to create mischief [47,225,232].

This issue is usually addressed by providing effective mechanisms of preserving employees' privacy while demonstrating the validity of the problems they raise by having them acknowledged by other employees. The developed system effectively achieves the first part of 'preserving employee privacy' [1]. However, the second part is the one that usually requires additional activities and involvement of relevant parties outside anonymous discussions, putting further emphasis on the *trust* towards this inter-organisational platform for voice [110,225] and the associated process. The platform needs to be trusted by all parties: implementing these privacy mechanisms strongly influences the perception of safety, validity, and efficiency of the process [1]. The particular features and affordances of such employee voice tools shape the way people voice their concerns and manage expectations of the potential outcomes [110,262].

Nevertheless, assuming that these tools and mechanisms do provoke sincere and valid changes and are supported by managers they tend to have a more positive and sustainable influence on employees and their perception of the workplace environment. Employees who perceive that they influence decision-making processes will likely hold a more positive view of their communication with management. As a result, they will report high levels of job satisfaction [82,289].

If they are designed and correctly configured, digital communication channels can amplify the effectiveness of employee voice in organisations. They do so by providing various ways to participate in identifying, validating, and sharing different issues and concerns, and enhancing the insights that arise from

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discussion [110,199]. Thus, the principle underpinning EVPs in organisations is to ensure a visible impact of employee voice on operations on the ground: that is, the voice drives some change [8,21,165,232]. At the individual level, changes to the employee's perception of work and their control over it, changes in attitude and motivation, and potential behaviour changes that positively affect one's performance are all important [21,248]. At the more comprehensive unit/department or organisational level, the impact on innovation, learning, productivity, and the quality of decision-making must be observed to ensure ongoing management buy-in to the process [21,231,333]. Similarly, the provision of constructive feedback from managers or peers during the EVP process helps validate the process's outputs in participants' eyes and improve the overall quality of the process [47,212,262].

6.3 Deployment and Methodology (Plan/Act)

The overall aim of this cycle was to explore how an EVP can be effectively embedded into an organisation. Understanding which parties can and need to be involved is required in order to understand how this process can be designed, and how it can be organised effectively. As noted earlier, **Chapter 6** addresses two research questions: one addressing the impact of prevailing organisational culture and the other addressing the actions we might take to ensure a successful and sustainable EVP. Many factors influence how employee voice operates on the ground, and are at play from the moment a concern is raised up until the delivery of an outcome [330]. These factors include the perceived affordance of the organisational channels [110,113], the availability of these organisational channels [113] and the perceived safety of speaking up [47,84]. For a variety of reasons, an overly deterministic or pre-planned engagement is unlikely to work. The author's role (in facilitation) was to support the initialisation of the first step (deployment of *OurVoice*), leaving the remainder of the process to participants' collective decision-making (see Table 7). In this study, participants comprised two groups: *(i)* casual employees and *(ii)* the managers of the department. The backgrounds of these participants are set out in more detail in the subsections below.

From a practical perspective, it is necessary to understand how to foster effective and meaningful discussion (which leads to an improved workplace) between casual workers and management. Employee voice is a longitudinal and subtle phenomenon. The differing management and employee perceptions, the underlying contextual factors (i.e., organisational culture) and the implementation details such as the specifics of communication channels are all critical to the success of the process [22, 39, 60]. From this perspective, this cycle is perfectly conceived as another AR problem involving the iterative and practice-led exploration, analysis and evaluation [35,62]. In this cycle of the case study, participants were the main driving force of the decision-making and direction of the EVP. The process unfolded iteratively, driven by participants (establishing their agency and influence over the EVP) and was merely supported by the research team. At different times, it was led either by managers or casual employees, depending on the stage of the process. The details of this natural unfolding are described in the corresponding section of the Findings (6.4).

The research team were uniquely situated in this work as researchers within the institution and simultaneously members of the casual employee group and department management team members. The Autobiographical Design approach was adopted to ensure an appropriate research lens on this complex problem. This research design is 'based on actual extensive usage by those creating or building a process or a system' [261]. This approach supports the speed and flexibility of design responses based on the actual usage of the system, which is essential here due to the dynamic and cyclical nature of employee voice. In addition, the complexity of workplace culture meant that only by being an employee could participant observation provide effective, comprehensible insights into the organisation's practices [114,152]. Power dynamics of the workplace are a complicated matter to investigate, so the ability to combine the insider (as the participant) and outsider (as researchers) viewpoints helped capture a comprehensive picture [114,164]. Members of the research team participated in the process from the side of both management and sessional staff members. The involvement of research team members also allowed for the use of an insider's perspective. This advantage allowed for the deployment of the initial steps of the

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system in days to tackle the changing circumstances arising from the COVID-19 pandemic (namely, the altering of teaching during the deployment by shifting classes online and limiting the intake of students). Moreover, research proximity provided an opportunity to follow-up on proposals, from being integrated into the teaching strategy to being realised on the ground. To address the potential criticism that using autobiographical design usually faces (i.e., that the approach lacks transparency about the author's roles and perspectives) [81], I disclose that I, as the author, was a part of the sessional staff cohort (but did not contribute to the discussions in the study). The other member of the research team had a management role and was responsible for education support at the time.

6.3.1 OurVoice Configuration (Plan)

The initial facilitation of the employee voice within the study was achieved using *OurVoice*, (Figure 19). Since the timing and context of the study were influenced by the developing global pandemic (COVID-19), the usage of a digital platform was necessary not only from a privacy and trust perspective [1,184,225] but also as the only available option due to the lockdown and work from home arrangements.

OurVoice is underpinned by entirely proactive moderation (where all posts are reviewed before being published). Moderators focus on ensuring the constructiveness and frankness of discussion and eliminating any potentially
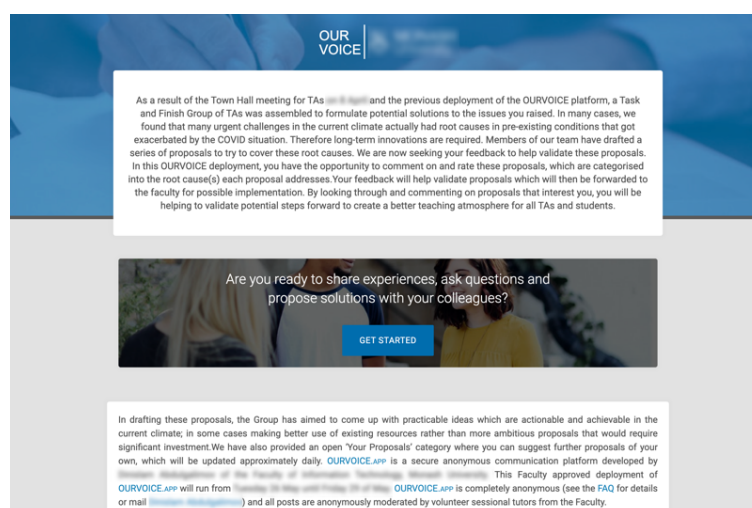
Figure 19. Web-based interface of the OurVoice system branded according to the organisation guidelines (blurred).

harmful or aggressive behaviour, ensuring users follow other posters' (positive) examples when posting comments or messages [308]. During the case study, the

system was moderated by a small team (4 people) of sessional staff members who volunteered for this role and did not participate in the process other than moderation. All moderation team members had previous experience tutoring in the Faculty. Two of them were active tutors during the deployment, and thus had contextual knowledge while balancing out the anonymity and potential ability to identify people. Each of them has been supplied with instructions on performing moderation according to the code of conduct. As suggested in **Chapter 5**, this moderation happened remotely in an asynchronous manner without any physical or video meetings. This arrangement allowed for less pressure to be placed on moderators, who could conduct moderation during the day when it was most convenient for them. The only edge cases in which moderator meetings took place were where posts and messages rejected by one of the moderators required moderator discussion regarding the reasons, which led to either deletion or editing and approval.

6.3.2 Cycle Context (Act)

The cycle was conducted in a different context to that of the previous cycle. This cycle was conducted in a Higher Education Institution (HEI) over three months at the start of the global COVID-19 pandemic, forcing everyone to shift to work from home. This process was initiated in collaboration with the department's management team. In this case study, participants drove the whole EVP. The research team was specifically open to emergent steps that might follow this first week's deployment (e.g., engaging sessional staff in active discussion). As discussed above, the participants of the EVP were comprised of both managers and sessional staff members and can be further divided into the groups presented in Table 6.

Table 6. Participant Groups and their Roles.

Position (participant group)	Role and activities
Managers (academic)	*Description*: Academics (professors) in managerial positions within the department responsible for education, graduate research and ensuring delivery of modules.

	Access: They did not have access to the system as users, but they could see discussions after the moderation and when the deployment finished.
Managers (professional staff members)	*Description*: Professional staff members who governed and managed operational aspects of department functioning and delivery of education and modules allocation. *Access*: Identical access rights as managers (academic) above.
Sessional members of staff (*OurVoice* users)	*Description*: Sessional staff members who conduct tutoring, consultation and marking within the department. They responded to the call for participation in the EVP process, provided their feedback and participated in discussions in the OurVoice system as anonymous users. *Access*: They had access to the system as users and were able to see post-moderated discussions. They were also able to see if the comment or a message was moderated.
Sessional members of staff (*OurVoice* moderators)	*Description*: Sessional staff members who responded to the call to act as moderators and check threads and comments of users before publishing them in the system (through the dedicated interface in the system). They had similar responsibilities within the department as the previous group. *Access*: They had access to the system like the users, and as moderators, they could reject or edit a message.
Sessional members of staff (TFG members)	*Description*: Sessional staff members who also participated in the EVP and responded to the invitation to become TFG members after the Town Hall meeting. They had not participated in the moderation of the system). They had similar responsibilities within the department as other sessional staff members. Some of them were more experienced in leading a module (unit) and being responsible for delivering the module to students. *Access*: Identical access rights as OurVoice users (3rd row). plus after the deployment, they worked on formulating proposals and creating the report for managers based on discussions.
Researchers	*Description*: Members of the research team who had facilitated the execution of EVP. This group consisted of people from the sessional staff cohort and managers. *Access*: They had differential access to the system. The researcher who held a managerial position did not have access to the system at all: only to the outputs of discussions after the deployments were finished (similar to other

	managers). The researcher, who also held a sessional position, had access to the system as an administrator and could see all the comments and messages. He was also invited to one of the TFG meetings.

The system was accessible only to sessional staff members (based on their emails and registration as a sessional staff member for the semester) within the department, a subset of whom moderated the system. At the beginning of the study, the enrolment message to participate in the discussions in *OurVoice* was broadcast. At the same time, an invitation was issued to all members, asking them to volunteer as daily moderators for the duration of the study. Four volunteers were chosen based on their ability to do it twice a day, every weekday. These volunteer moderators did not participate in the EVP in any other roles apart from being a moderator.

The department's casual workforce consisted of 397 members (officially registered for that year as sessionals), typically contacted by management via a restricted electronic mailing list. The department in which we conducted our study had 175 full-time employees who worked alongside the 397 sessional staff members (on short-term contracts that are often renewed). Sessional staff members were primarily split across two groups: *(i)* professional tutors and *(ii)* transitional tutors who were simultaneously studying for a research degree (PhD and Master's students). Because the *OurVoice* system is anonymous, we do not know the exact distribution of these two groups of sessional staff members among the users: we only know the overall number of sessional staff members who directly participated (either they left a comment, started a thread or voted to upvote or downvote a comment or thread) was a total of 104 users. Sessional staff members often work across multiple universities and use tutoring as their main income source or side earning. As with any casualised workforce, sessional cohorts have various issues around their work, status within the department and social and financial uncertainty. For instance, they do not have a presence on the university website, and they are not recognised as full academic staff members. They do not have the means to communicate through university-backed channels (like the mailing list), meaning that they are isolated from one another, creating an interesting context for deployment as there are no competing alternatives.

Moreover, they were not represented by any union within the university. Thus, they were considered a non-unionised casual workforce.

6.3.3 Evaluation Methods

A hybrid approach [109] towards evaluation was adopted in this cycle, providing a detailed descriptive account of *what* happened during the deployment and related behavioural observations. In addition, semi-structured participant interviews helped us understand how they felt the process operated and understand *why* the events unfolded in the way they did.

From the perspective of direct observations, a wide range of information points were used as sources. These included: *(i)* discussion threads and posts that were captured through the system, deployed twice for two weeks in total (for a week each time), *(ii)* a report created by a group of casual employees as a combination of proposals and (iii*)* meta-documents that support meetings and discussions between managers and the group of sessional employees who volunteered to become a member of the TFG (see Table 7 in the Findings section for an overview of the deployment). Simultaneously, the research team acted as the *participant observers* (of the EVP process) and drew upon the day-to-day observations and engagement (of deployments and meetings between managers-managers, managers-employees, employees-employees). Research team members were in the position of reflective partitioners [164] where they 'functioned' with the organisation along the process (in the context of an 'inquiry from the inside') [114].

After the end of the process, semi-structured post-study interviews were conducted with 14 respondents. The interviewees included: five (three females, two males) casual staff members who participated in the process only as users of the system (U1–5); five (three females, two males) casual staff members who became involved in the analysis and creation of the report as members of the TFG (T6–10); and four (two males, two females) managers that represented and drove the process from the faculty side (M11–14). The interview questions outlined in Appendix I. were developed from a combination of direct observations and the need to ensure appropriate coverage of the 'how' and 'why' concerns, with a particular

emphasis on understanding how established EVP operated as an effective *end-to-end* process. Subsequently, I analysed the gathered corpus of qualitative data by employing thematic analysis (following Braun and Clarke's method [327]) with sufficient flexibility to ensure that the key concerns are properly addressed.

Throughout the process, different ways of interaction and various produced artefacts from the participants' side were registered. Overall, this study generated 64 threads and 51 comments during the first deployment of *OurVoice* and 18 threads and four comments during the second deployment. Quotes from the system are marked as '*Anon*' where they are used in the following account. These comments seeded the topics for discussion for the post-process interviews and the overall qualitative analysis. Additionally, five themes were identified after the Town Hall meeting between management and sessional staff. The Town Hall meeting (which took the form of a video conference due to the pandemic) was originally assumed by managers to be the concluding activity between a manager and the department sessional workforce to reflect on the discussion in *OurVoice* after the first deployment, acting as the conclusion of the employee voice endeavour. However, this 'end' was more like a beginning, with the resulting follow-on activities being *(i)* a further *OurVoice* deployment, *(ii)* formation of the TFG of sessional staff members, *(iii)* the development of 20 proposals for addressing identified issues, and *(iv)* a detailed final report (fully led by casual staff members).

6.3.4 The Organisation of the Employee Voice Process (Act)

The detailed summary in Table 7 below depicts the chronological order of the process that participants drove and happened during the case study. The visual representation of the process in Figure 20 supports this. No preconceived structural restrictions were imposed on the process. That there was no design or plan beyond the initial deployment enabled the author to use the EVP as part of the case study and render it as an outcome of the cycle that naturally unfolded through the influence of the involved parties (employees and management) at the different stages. The only concrete intervention from the research team was the first deployment of *OurVoice* (see Table 7), which was carried out in collaboration

with the department managers (who initialised it) and two sessional staff members (who helped to tailor preliminary categories). These sessional staff members were chosen due to their teaching experience and recognition among other sessional staff members and Faculty management. At a later stage, one of the sessional staff members joined the sessional task and finish group that was organised to analyse and action the data collected by the *OurVoice* deployment.

The first deployment of *OurVoice* signalled the beginning of the process, initiated by management and driven by two sessional staff members. While the start of the EVP was first proposed by management, the sessional staff took responsibility for ensuring the day-to-day running of the process, including the daily moderation of contributions on OurVoice.

Case study Process
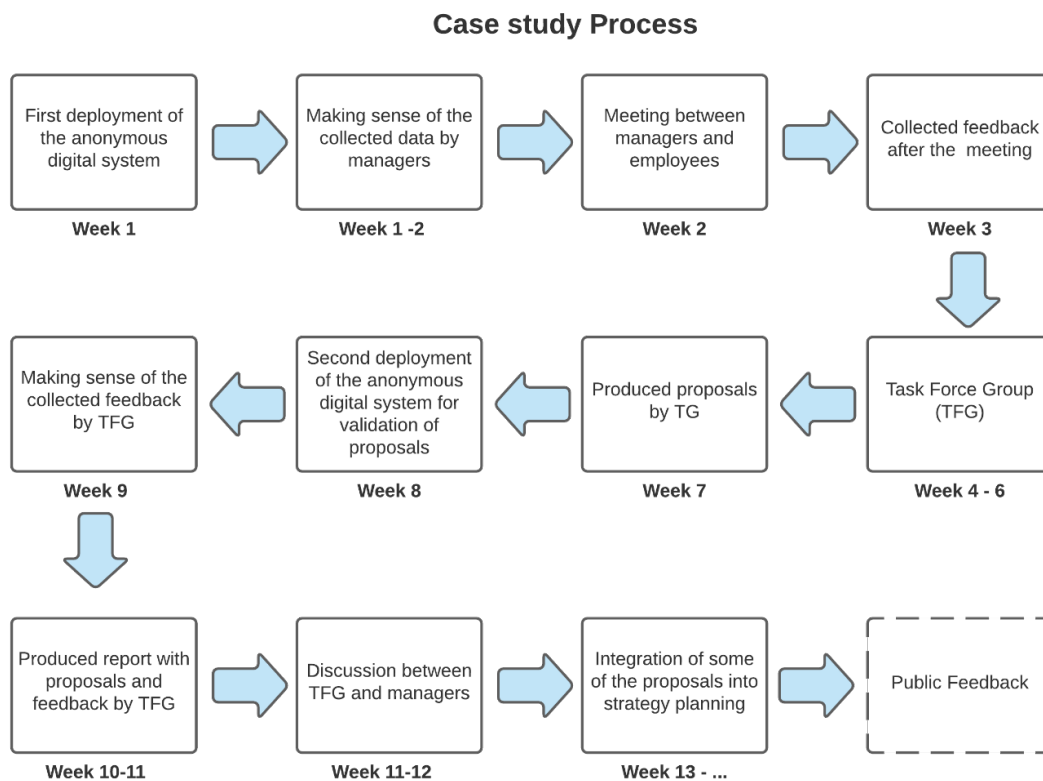
Figure 20. Chronological Structure of the EVP Process.

The initial topic categories were identified by both parties (managers and sessionals) as *Well-being, Training and Support, Teaching Online*, and *Technologies,* as well as an '*Other'* category to address any other topic that came to mind. Additionally, to engage with the tutors, a set of emails were broadcast through the representatives and Faculty management, inviting sessionals to

participate. Everything that happened in this cycle after sessional staff members or managers initiated the subsequent Town Hall meeting was a response to the previous stage's results (Table 7).

Table 7 Stages of the Employee Voice Process during the Case Study and Researchers' Role.

Stage	Stage Actions	Stage Results	Researchers' Role
1.First deployment of *OurVoice* (**W1**) triggered by researchers	organisation of the participant-driven discussions and anonymous feedback collection	messages & comments	deployment initiation engaging with employees for system configuration
2.Sense-making by management (**W1–W2**) triggered and led by managers	identification of the main topics & themes, appointment of responsible people to respond to concerns during Town Hall	list of topics and concerns of casual workers (through the managers' lens)	participation as a manager
3.Town Hall meeting. (**W2**) triggered and led by managers	broadcasting managerial point of view and identified themes back to employees	limited feedback during the session decision to collect more feedback using *OurVoice*	participation as a manager (reporting on a theme)
4.Additional feedback through OurVoice (**W3**) triggered by managers, led by employees	prolongation of the system deployment for reflection on Town Hall meeting (4 days)	received mixed & negative feedback advertisement of the next step (sessional task group) and invitation to participate	none, apart from running the deployment for more days
5.TFG (**W4–W6**) triggered by managers, led by employees	collected data, analysis and topic identification topics grouping in themes and distributing between members for further analysis	list of themes, causes & potential solutions hierarchy of topics & themes	supporting the TFG (sharing deployment results, ensuring working hours)
6.Proposals by TFG (**W7**) triggered and led by employees	aggregation of themes, causes & solutions prioritisation, based on TFG discussion	set of preliminary proposals decision to deploy *OurVoice* feedback collection about proposals and prioritisation	none
7.Second deployment of the *OurVoice* (**W8**) triggered and led by employees	held discussion regarding the proposals by other casual staff members	messages & comments	deployment support
8.Sense-making by TFG (**W9**) triggered and led by employees	analysis of the collected data discussion & amendment of proposals	final version of the proposals with scopes, suggested steps & timeframe	none
9.Report with proposals by TFG	aggregating & compiling of data	report with the final version of proposals	none

(**W10**–**W11**) triggered and led by employees			
10.Discussion between TFG and management (**W11**–**W12**) triggered by employees, led by employees and managers	conducted meetings and discussion of proposals and the potential next steps	list of actions for integration or investigation of identified issues responsible managers	participation as a manager
11.Integration of proposals (**W13**) triggered by employees, led by managers	inclusion of short-term and medium-term proposals into a teaching strategy further investigation of the other proposals	time schedule and plan for addressing issues no clear communication back about the plans	participation as a manager

As Table 7 shows, managers led the discussion analysis after the first deployment of *OurVoice* (as in Figure 21) Sense-making was conducted by grouping all messages (based on a theme) from the system to match different categories based on whether they were actionable from the management side (see item 2 in Table 7). Following their analysis, management prepared their responses to the questions raised on *OurVoice* and organised a Town Hall meeting with sessional staff members. The Town Hall meeting lasted one hour and was attended by more than 300 sessional staff members. The meeting resulted in mixed feedback (negative and unsatisfied) from sessional staff members due to how the conclusions were represented (see items 3 and 4 in Table 7) and served as a starting point for an extended EVP.

Figure 21. An example of a discussion thread in the OurVoice system. On the left is the original post and the beginning of the comments thread under it, while a continuation of the comments thread is on the right.

The collected feedback, posted in the system after the Town Hall meeting, highlighted that employees were not fully satisfied with the way the meeting went, commenting that discussions from the system '*seemed wasted in a Town Hall*' [*Anon*] and perceived it to be '*staged*' and '*formal*'. In response to the criticism, management invited sessional staff members to step forward and form the small TFG, the main purpose of which was to analyse the data from the staff perspective since they were '*best placed to come up with ideas as to how to improve the online experience for our students and our staff*' [*M11*] and communicate them clearly in a united voice.

Thus, the TFG of five people was organised and supplied with all anonymous data from *OurVoice* (by the author). The call for the formation of the TFG group was broadcast by one of the managers through the organised mailing list of sessional staff members. The TFG held five meetings in the following two weeks (item 5 in Table 7) to analyse the data. The result was a list of 20 proposals (Appendix J.), with the issues divided into groups based on '*6 identified underlying root causes behind the issues raised*' through the *OurVoice* deployment. The goal was to '*come up with some practical and achievable solutions to target these root causes directly*' (item 6 in Table 7). No constraints were placed on the TFG other than a time limitation (up to 3 weeks) and a cap per TFG member for the paid time spent on these activities (paid at an equivalent rate t teaching).

A key outcome from the analysis was the decision to run another deployment of *OurVoice* in conjunction with the research team (item 7 in Table 7). The goal was to put forward these proposals and collect feedback from their colleagues to help '*validate suggestions*' [*T6*]. Like the first deployment, the process was led by sessional staff members through their discussion and voting for the proposals (item 8 in Table 7). However, this time, rather than asking sessional staff to contribute their ideas, TFG pre-populated the platform with the proposals that they had drafted earlier. Users were invited to rate the proposals, make further comments, or suggest their own proposals for future discussion. By the end of the second deployment, the TFG produced a report ranking the proposals on their popularity and affordability (by Faculty) based on feedback received through the second deployment of *OurVoice* (item 8 in Table 7) and submitted this to

management. A series of discussions led by managers and TFG members were then held to identify proposals and solutions. This process resulted in more nuanced and detailed discussions around each of the proposals, considering their implementation, scale, and timing (item 10 in Table 7). Ultimately, some proposals were integrated into management's strategic planning for the faculty (item 11 in Table 7). These mostly consisted of short-term proposals initially, which were required to be addressed quickly or demanded fewer resources. In contrast, medium-term or long-term proposals were included in financial and teaching planning and assigned to a responsible person/team (see sections below for more details).

As demonstrated in the description above, the process had a particular progression guided by each of the involved parties (sessional staff members, managers and TFG members) and accompanied by the shift of the leading role over the different stages of the process.

6.4 Findings

6.4.1 Hierarchical Exclusion.

One of the important factors that sessional staff members referred to is their perceived position in the workplace hierarchy, which underpinned most of their interactions in the workplace. The hierarchy was characterised as '*widely unstable*' [U3]; sessional staff felt '*disposable*' [Anon] and believed they were considered '*second class*' and likely to '*get a cold shoulder first*' [U1]. During the interviews, this point of view was reinforced through observations of them '*not being in position of power to speak*' [T10] and '*considered not so important*' [Anon]. This precarity is one of many contextual factors that affect employees throughout their work-life in an organisation, along with their perceived fears and personal inhibitors.

> U2: '*…because as sessional staff, you deal with people from different levels of your organisation. And sometimes you might not feel safe at work when you express your own opinions, maybe because of cultural factors, maybe because of your gender or maybe because you're in a way, not in a higher position as them, in the hierarchy…*'.

The cycle also highlighted the pressure placed upon sessional staff members due to their '*heavy load'* around tutoring and supporting students, a situation that was exacerbated by the need to introduce remote teaching. Many sessional staff members share the view that while they '*do the majority of interactions with students and teaching and consultation'* [U5], they are not always '*recognised'* for their input and, as a result, '*don't have a lot of say'* in the way it is organised. Also, their work does not end until the exams are finished, thereby '*putting high pressure and load on them to deliver a result'* [T9]. These concerns demonstrate the prevailing sensitivity of sessional staff members regarding their position of '*not being recognised'* and not being valued as academic staff within the department.

> T7: '*It's actually the tutor teaching most of the things to those kids in the smaller classrooms, that's where the actual learning is happening, a lot of learning. We help them with their assignments. Our job doesn't end until the exams finish. So we are involved with the students most of the time. So I think they have to better recognise our contribution'.*

Overall, the sessional staff position manifests itself in the following ways: *(i)* not being invited to department-wide meetings; *(ii)* not having physical space, leading to feelings of being excluded from the department and the teaching community; *(iii)* not being consulted about changes; (iv) short-term contract status; (v) absence of process whereby leaders for the units have total control irrespective of their past performance under a previous lead. From the manager's position, this is due to the '*pressure to save money'.* However, the lack of a meaningful dialogue with management and the failure to be invited to departmental meetings contributes to a vicious exclusion circle. For sessional staff members, the opportunity to voice concerns was closely linked to recognising their contribution as professionals, such as tutors, lecturers, and faculty members. What partially facilitated the engagement we observed in introducing *OurVoice* (item 1 in Table 7) is the safe and secure place to share concerns. This status quo of the existing hierarchy within the organisation and sense of exclusion that sessional had manifested themselves. The strong contextual aspects affect employees' perceptions towards voicing and their possibility of effective communication with managers.

6.4.2 Absence of Communication Channels

Another aspect that became apparent in this deployment is that sessional staff struggle to speak up within the organisation. At the beginning of the study, the absence of two-way communication channels (e.g., a 'direct line') and dominance of top-down communications (e.g., in guidelines on how to act in the changed context) became apparent, to the extent that it provoked the deployment of *OurVoice* system:

> *M11: 'it seemed that there was very little visibility of the sessional staff…*
> *in terms of faculty communications, reaching them or even hearing their*
> *voices. They were very, there was no real significant representation'.*

Since the start of the COVID-19 lockdown, tutors were left with many questions regarding potential ways of conducting teaching from home. An EVP became timelier due to the growing need for a facility to voice concerns as the educational process changed. They expressed the need for a process where a combination of the new factors (COVID-19 response and need to act quickly) and existing factors (around a perceived lack of recognition) highlighted the importance of a mechanism for voicing concerns and being heard.

> *M12: 'Firstly, that there was suddenly a big concern around teaching*
> *and teaching quality and that there was a risk to it caused by COVID*
> *and also around staff wellbeing, and they didn't have good*
> *understandings, good ways to really understand how sessional staff were*
> *coping with COVID-19, because those two way communication channels*
> *didn't really exist. So I think that [OurVoice] was a recognition of that'.*

As a result of these circumstances (the need for rapid responses), sessional staff saw themselves as the best placed to identify issues, due to their vantage point on the front-line of teaching where *'the actual learning is happening'* along with the *'direct communication with the students'*. They emphasised that the employees' awareness of the context is a factor that drives the sense-making during the different steps of voicing concerns. Interestingly, managers were unclear on the ways to organise the EVP in the existing transactional environment, not only because there were no clear channels for that, but also there

were already some *'preconceived ideas'* [M14] of what they *'thought was where the issues and was important'* [M11].

> *M13: '…sessional staff, kind of unfortunately, they sit in limbo, kind of between academics… It gave us, I think, a more reliable way, insight into what the factors were that were important to them at that time'.*

These issues of the voice and tension in the moment caused anxieties regarding the ability to speak up among sessional staff members, putting more pressure on the effective realisation of the EVP process. The importance of clear communication, perceived openness and commitment from management was emphasised.

> *T7: '…staff wanted to engage with us in a positive way and that they did engage in order to, you know, suggest improvements. They actually were people who cared enough to suggest improvements'.*

The role of the feedback from managers to employees is highlighted, particularly regarding the *'what happens next'*, to prevent *'disappointment'* and the perception of *'going to a black hole'*. Due to the existing tensions and internal and external inhibitors (perceived or otherwise), the effect on management's understanding of the context and sessional staff members ability to speak up within the organisation outside (before) the deployed process was negative and characterised as *'undermined'*. Interestingly, the introduction of the *OurVoice* system's helped address this anxiety of speaking up and provoked people to share their ideas.

> *U5: 'Yeah, I think it's, it is really good that there is an anonymous platform because sometimes, you know, being a sessional staff, you don't feel like expressing all your opinions with others'.*

During the study, the anonymous element of *OurVoice* allowed sessional staff to address the anxieties related to the workplace environment. The system encouraged employees to speak up and contribute, giving them a safe and direct forum to express their views, and a sense of belonging to a community of others who felt the same way.

> *U3: 'Sometimes knowing what people are feeling the same can you know, help. Um, so yeah, they wouldn't have seen that, that they weren't the only one feeling that way'.*

As was pointed out by sessional staff during the case study, one of the implications of the EVP and digital tool deployment that was organised was identified as an important *'condition'* for progressing forward.

6.4.3 Sense-making and Proposal Identification During the EVP

6.4.3.1 *Themes Identified by Participants (TFG)*

In the end, the following six main themes (root causes) were identified through the EVP, based on the anonymous discussions using *OurVoice* (see Table 8). These themes formed the backbone of the discussions during the meeting between the TFG and management. Although the detailed content of the topics of discussion is not the focus of this chapter, unlike the EVP itself, the findings have pointed out an interesting process of identifying different context-related topics that were framed according to their perceived importance and realisation plausibility. This was done through the iterative process of deliberation and sense-making between all involved parties (employees and managers).

Table 8. The six main themes (root causes) identified by TFG. The range of areas of concern identified is highlighted in this table.

Root Cause (main theme)	Description	Sub-Categories
Ineffective Allocation of Existing Resources	Cases where a solution to an issue raised already exist within the Faculty, but the expected benefits have not been realised or properly addressed.	Training Sessions Availability, Specify, Delivery of Specialised Technical Support and Training Material Accessibility.
Pedagogical Stress	Problems around the delivery pressures for pedagogical content resulting in stress and/or unexpected workload requirements for sessional staff members.	Student Concerns and Anxiety, Student Engagement and Academic Expectations, Transition of in-Person materials to Online Materials, Preparation of Teaching Materials.
Teaching Staff Well-being	Concerns about the inclusivity of sessional staff within the faculty, their perceived position, uncertainty among staff and access to resources and facilities.	Inclusivity and Accessibility, Sessional Staff Facilities and Resources, Empowering Sessional Staff, Fostering Productive and Harmonious Work Environment.
Job Security	Concerns around sessional staff career progression and certainty about their role within the institution.	Alternative Opportunities for Sessional Staff, Secondary Activities Outside of Semester, Transparency Regarding Process for Hiring Sessional Staff.

Information Dissemination	Issues around the distribution of information and cases where it has not reached those who required it.	Dissemination from Central to Faculty, Unit to Sessional Staff, Dissemination from Faculty to Sessional staff, Student Uncertainty, Transparency in Contingency Management.
Technology/Infrastructure	Concerns around the availability of IT infrastructure and support that has not been sufficient for teaching or learning requirements.	Internet Connection for Staff and Students, Specialised Mandatory Software Student Access, Availability of Specialised Technical Support.

The TFG work process that led to the 20 proposals is typified by the proposal to *'Address Tutor Workspace Issues'*. This proposal was initially distilled from the discussions in three different categories in *OurVoice*: *(i) Well-being, (ii) Technologies* and *(iii) Teaching Online*. The issues raised by users started from the technical side (e.g., *'struggles to deliver classes online'* due to *'unstable internet connection'* and *'home supply accidents'*). However, these concerns moved onto the more nuanced issue concerning the unsuitable environment for work (*'shared environment'*, *'family members'*, absence of *'dedicated workspace'* for teaching) and the necessity for better teaching arrangements due to the move online.

> Anon: *'…the move to online teaching presents its own unique challenges. [We] need better capacity planning and scalability…'*.

During the Town Hall meeting (Week 2), these issues were recognised by management, however, management did not communicate a concrete plan of action or even suggestions for tackling them within the Faculty. These issues were identified by TFG as relevant for that moment during their deliberation (short-term, working at home away from campus), resulting in a set of proposals aimed to overcome tutors' technological and workspace limitations. The range of suggestions include providing backup solutions for connection to online classes (e.g., 4G LTE connectivity equipment), improved workspace facilities through university-aided packages (e.g., home office equipment), to more long-term suggestions beyond present COVID-19 limitations for providing tutors with *'dedicated spaces for online teaching'* [report], meetings with students, and breaks. These suggestions were validated through voting during the second deployment in Week 8. They were also linked to other proposals, such as *'Sessional TA Shared Workroom'* for *'facilitating teaching and unit coordination-related duties'* [report].

During the meeting with management (Weeks 10 and 11), the TFG raised these concerns and discussed these proposals, which resulted in the inclusion of the specified steps into the Education Strategy and the allocation of resources and a responsible manager to control the process. For example, these include: (i) the identification of the rooms that were equipped to hold coordination meetings, (ii) the upgrade of the internet plans that can be distributed among those sessional staff members who had internet connection difficulties, and (iii) protocol development for online teaching.

6.4.3.2 *Evaluation of Proposals by Employees (TFG)*

All the discussions initially held by the sessional staff members in the first OurVoice deployment went through deliberation and a *'fairly freeform discussion'* [T6] by TFG members with the subsequent sense-making and realisation comprising of a set of virtual meetings between TFG members. The themes of the initial issues and concerns were listed with the identified root causes and potential solutions and a proposed timeframe and monetary cost for addressing them. Proposals were categorised based on the identified root causes and sub-causes through a *'brainstorming activity'* [T7] in which TFG members participated. Additionally, they were grouped according to the perceived timeframe of realisation of solutions, as follows (according to the TFG report): (i) short-term, implementable *'within the semester or as relevant to a transient situation'*; (ii) middle-term, implementable *'within the next semester and may be of long-term value beyond the current situation'*; (iii) long-term, implementable *'within the next year and is of long-term value beyond the current situation'*. The TFG then decided to distribute the proposals between the TFG members for further work and potential solutions identification based on their *'own strengths and diverse opinions'*. All the TFG members went out in their own time and wrote down the *'broad outlines for 3 to 5 proposals a person'*. This distribution resulted in a few cases where the TFG (as a collective) had to stop the development of the issues so that they could deliver the result in time:

> *T5: 'It was necessary to cut out a lot of a team task[s]...people had been developing these proposals, they started to sort of get involved with the process too much'.*

Eventually, these proposals were validated by other sessional staff members (in the second deployment of *OurVoice* that took place in Week 8). The reception of each proposal, together with further remarks and recommendations from TFG, was included in the resulting report submitted to management (see Figure 22 for an example of a short-term proposal).

Figure 22. TFG Report: a. A list of proposals categorised by root causes. b. The substantive content of the report. c. An example of the short-term proposals regarding non-teaching time and training for sessional staff members.

The metrics used by the TFG for rating and prioritising the proposals were reported as being (i) the 'potential to have a strong positive impact' [T8] and/or (ii) being 'intuitively helpful towards the people that are being asked to give feedback' [T6]. Such a broad set of criteria can result in subjective assessments. In part, this is why they decided to validate the understanding of priorities with the other members of the sessional staff cohort through the second *OurVoice* deployment.

6.5 Discussion and Conceptual Resources for Embedding Employee Voice (Reflect)

These findings helped to uncover design considerations for EVP embedment that lead to questions around the continuity and sustainability of EVP within the organisational environment. This subsection focuses on factors that can make it possible for an EVP to be embedded into an organisation sustainably. This leads to conceptualisations of the three design considerations: *(i) Progressive Assurance, (ii) Bounded Accountability,* and *(iii) Bias Reflexivity.*

6.5.1 Employee Voice Process in a Transactional Environment

The findings of this cycle point to a workplace environment that is inherently transactional and hierarchical and lacking even the most basic mechanisms for sessional staff members to communicate directly with management. In line with findings in other sectors [38,280,293], while there was no explicit and direct prohibition on 'speaking up', a combination of management structures, employment practices and organisational culture combined to suppress employee voice. Where communication mechanisms exist, they were perceived by sessional staff to be framed by management's assumptions about the concerns of sessional staff members, including that that sessionals' only concerns were about their terms of employment. Consequently, the process is not concerned with feedback and serves to marginalise matters such as teaching delivery and the student learning experience (which were, on the whole, the primary concern of most sessional staff members). Moreover, there were no channels for direct horizontal communication between sessional staff members. Even the 'all sessional staff' mailing list only permitted members to receive emails from management or the management's proxies who administered the list.

Within this context, the introduction of *OurVoice* is best characterised as an insider attempt to constructively disrupt the unidirectional (top-down) character of the prevailing management-employee communication. Indeed, this corresponds to the idea raised in previous studies of balancing out the control over this

communication between all involved parties through computer-based mediation, providing employees with responsibilities and a means of control in the process [165,186,299]. The initial framing of the *OurVoice* deployment was not ambitious. The deployment was a dialogical extension of the previous cycle to use an anonymous online platform to source concerns and questions from staff before an 'all-hands' meeting (such as the *Town Hall* meeting that was the original target). Notably, the current consensus in management studies [47,48,84] suggests that such ad hoc approaches are unlikely to be productive. Given this, the research team was aware that introducing an employee voice system (as it is) was unlikely an effective action. The assumption was that *OurVoice's* qualities of anonymity in particular (not apparent in traditional deliberation and communication frameworks [84]) would at best support discussions between sessional staff and the identification of topics at the Town Hall that would otherwise not have taken place [1,110].

However, this cycle of the case study gave rise to processes and forms of engagement that exceeded initial expectations. The TFG, on its own initiative, chose to validate their initial proposals with other staff members through a second deployment of *OurVoice*, and refined and presented the proposals in a manner that would address their perception of management concerns. While not every proposal was adopted by management, a substantial proportion of them were integrated into the Education Strategy and plan for the Faculty. The factors arising from the transactional nature of the environment contributed to the success of the deployment: they acted as the unusual contextual factors that have a positive effect on the uptake of the EVP. The lack of previous attempts to engage staff views suggests that there was no 'initiative fatigue', and the conspicuous absence of horizontal channels of communication meant there was a latent desire on the part of the sessional staff members to communicate with each other. A final noteworthy point from the established EVP is that employee voice can still be initiated and realised without requiring a major shift in workplace culture. Potential reasons for this are discussed below. The design of an EVP intervention in such an environment should account for the structure of an organisation and requires a degree of receptivity from the initiators of the process, whether that is

employees, managers or representatives, unions or another trusted third party. Overall, this indicates the complexity of the contextual factors and intricacies of workplace interactions between various actors.

6.5.2 Progression Assurance

Participants' accounts of their experience showed a belief that the process (which can take place over many months) was moving forward and would eventually lead to positive change. We refer to this as progression assurance, one component of which is *prospective transparency* [58]. That is, understandings and promises about what happens next need to be made upfront. Participating staff need to understand the outcomes of previous stages, how they will be used, and the purpose of the upcoming stage.

In this cycle, management used the communications made at the transitions between stages to foster progression assurance. For example, the description in the calendar invitation from management to all sessional staff introducing *OurVoice* explained the goal. The idea was to 'collect any questions or matters of concern that sessional staff might have'. *OurVoice* 'allows sessional staff to anonymously suggest and discuss questions and issues they wish to be addressed at the Town Hall'. Similarly, management's call for volunteers for the TFG explained how the goal was to 'collect and discuss those ideas and propose a set of actions to the Faculty to implement' which would be 'delivered as a short document, video or online presentation (the group itself can decide)'.

One significant issue that emerged was the interchange between the parties concerning the source of the assurance. Initially, management would initiate the assurance at the beginning of a stage, and this would be completed or closed by the sessional staff members who were most actively engaged through stage-specific feedback loops. These feedback loops were realised as communications originally from management but progressively from TFG members as they gained agency and control in the design and execution of the process. This assumption of control is most apparent in the lead up to the sessional-initiated second deployment of *OurVoice*, and upon its conclusion. For example, the TFG claimed

the goal was 'to come up with some practical and achievable solutions to target root causes directly' [email to all sessional staff members from the TFG chair].

The final component of progression assurance is the validity of workplace conversation: that is, the assurance that conversations reflect employees' views [47,232]. Here, validity implies that all involved parties perceive the contributions as relevant, authentic, and truthful. Indeed, validation mechanisms appeared as part of the emerging process. For example, the call during the Town Hall meeting to prolong the first deployment of the digital tool to collect feedback from can be viewed as the manifestation of the validation mechanism (i.e., the management's desire to validate employees attitudes towards the managerial response to *OurVoice* discussions). Thus, when designing the EVP intervention at the workplace, there is no immediate need to ensure specific results or provide feedback about the whole process at the outset. Instead, it is necessary to ensure that each of the steps or stages entails explicit outcomes and follow-up actions (or at least a point in time where these plans will be revealed). These issues highlight the gradual or progressive nature of assurance, building up over the advancement of the EVP. The ongoing openness and feedback between the involved parties is highly significant, demonstrated through the small validation actions during the process.

6.5.3 Bias Reflexivity and Validity

Using an anonymous employee voice system was intended to ensure that effective and fear-free discussions could take place. However, this inevitably led to perceived bias, and questions regarding the validity of what was being 'said'. If the system is part of the bigger multi-stage EVP, the validity of the results of one stage can influence engagement with consequential ones. During this cycle, perceptions of bias were most strongly associated with potential subjectivity in how accounts were interpreted. At the sense-making step, this interpretation is especially flavoured by the differing perspectives of those involved [19, 36, 40], For example, 'to be honest, I'm not actually sure how much the committee (TFG) is processing the *OurVoice...* or how much they're actually coming up with their own ideas' [M11].

Findings indicate that these perceived biases of subjective interpretation of the collected qualitative data (free form text and employee comments) have to be explicitly addressed through actions that imbue bias reflexivity. One way this can be addressed is through mechanisms of cross-validation between process steps to ensure the quality of outcomes. That is, that they satisfy the majority of participants. While the concepts of 'majority' and 'representation' form a long-standing concern in workforce studies, an emergent mechanism of representation in the form of the self-governing TFG was observed in this case study. The TFG was formed to represent staff (in sense-making, prioritising and articulating proposals) and as the initiator of the feedback loop with the sessional body. In line with previous studies in the wider context of collaborative or crowdsourcing work [124,165,212,340], it has been shown that the feedback loop initiation and provision of reflection can help to mitigate potential biases, act as quality control, and ensure the validity needed.

However, problematic situations can arise where the interpretation and reformulation of the proposal (e.g., by the TFG) is non-trivial or where there is no clear or generally agreed-upon metric for the degree to which an issue has been considered. There are limits to what feedback can achieve, especially where the sufficiency of actions in response to an issue (or scrutiny of an issue) is questioned. In such circumstances, the communication in *OurVoice* between the sessional staff members who are at odds with each other (to some degree) must be allowed to reach a saturation point (enough stated positions but without consensus). Thus, the point of saturation can be co-opted as the condition for progression. In such cases, bias reflexivity is not realised by the process of feedback, reflection, and agreement, but by the sheer weight of engagement and a pragmatic consensus that it is time to move on.

6.5.4 Bounded Accountability

Accountability is an important concern in any EVP, and the nature and mechanisms by which it is achieved vary considerably according to the context. The concept of *bounded accountability* used in this thesis has three components: *(i)* a commitment to specific responsibilities of people within the process; *(ii)*

transparency of these commitments; and *(iii)* perception of these commitments as realistic, known constraints. In concrete terms, bounded accountability means that promises and public statements by management, expectations placed on sessional staff, and actions undertaken by all involved parties are objectively and subjectively realistic. For example, several different bounds (often, in reality, norms) were placed on sessional staff. These included low expectations of participation at the outset due to their marginalisation as a subgroup of the workforce and the pressure they were under. In turn, this mitigated potential objections to them being required to participate in a new process. Similarly, the seriousness of management intentions was affirmed by the bounded nature of the statements of commitment from management as to the possibility of change (after the initial deployment and subsequent Town Hall meeting), further supported by the character of management's expressions of deference towards the range of views expressed within the *OurVoice* system.

However, *bounded accountability* is not constrained to aspects of communications and expectations: it is also manifest in the configuration of the scope of actions of the parties, be they management (who ultimately have the last word in decision-making) or the sessional staff most engaged in the process (the TFG members). For example, the scope of the discussion within *OurVoice* on teaching practices and staff well-being, rather than long-standing grievances about terms of employment, framed the employee voice activities as one that might lead to actionable outcomes. *Bounded accountability* can also be observed to be at play in the design and behaviour of the TFG group.: the temporary self-organising collective of sessional staff members, without prompting, acted within their resource bounds. The self-imposed limits on the number of consultation meetings between its members (i.e., time bounds) demonstrate this, as does the delegation of the validation step back to the wider group of sessional staff in the second deployment of *OurVoice* when consulting on their proposals (i.e., power bounds).

As an implication for effective EVP design, *bounded accountability* is challenging. It requires engagement with complex and highly nuanced considerations of how a process can take account of involved parties' awareness of the limitations and boundaries, and how these are expressed and made visible. In

this cycle of the case study, the quality of *bounded accountability* is uncovered as contributing to the sustained engagement of sessional staff. However, it was not a notion that was explicitly discussed by the primary actors (management and TFG members). Responding to the need for *bounded accountability* in designing an EVP and the digital systems to support such a process is unlikely to be straightforward. It is likely best considered through the questions that designers ask within a design process, a process of reflection when designing and having regard to the capacities and capabilities of the parties concerned, and how other employees will view these.

6.6 Conclusion

In this chapter I explored an *end-to-end* EVP that involved deployments of *OurVoice* with casual workers, which enabled a meaningful and an sustained interaction between workers and management. In this cycle, a number of characteristics of successful (and sustainable) embedment of the EVP were identified: *progression assurance, bias reflexivity,* and *bounded accountability.* Additionally, I explored how the contextual factors and the intricacies of interactions between different parties influenced the EVP. Strikingly, an unusual contextual driver that contributed to the success was the fact that there was little expectation of employee voice, a consequence of the historically transactional work environment. Employee voice systems might be particularly effective in the context of casualised workforces, where lower expectations counter the traditional inhibitions.

This study showed how through configuring and introducing the EVP, the existing patterns of interaction in the organization can help to support the employees' engagement with the process. The introduction of *OurVoice* is best characterized as an insider attempt to constructively disrupt the unidirectional (top-down) character of prevailing management-employee communication and move towards embedding employee voice in organizations long-term to drive sustainable change. The process also evolved, as participants' sense of agency developed (with limited facilitation from the research team in the initial phase). Overall, the introduction of EVP helped identify and address pressing issues (at

the time) and introduce policies and changes regarding these aspects in the department (e.g., Connectivity and Equipment issues, Workspace and Support). The complete list of identified problems is presented in Appendix J.

The complexity of embedding employee voice in a workplace environment is clearly dependent on a number of contextual factors, including the intricacies of interactions between the principal actors. This case study (including all three cycles) focused on informal bottom-up employee voice, framed by the initial motivation to address personal and organisational inhibitors and provide employees with a trusted, safe space for raising and discussing issues and concerns. However, there is no reason to exclude the alternative approach for leveraging employee voice; as **Chapter 2** outlined, the concept of employee voice also includes top-down and management-driven processes that leverage employee knowledge and experience by providing the opportunity to provide input into the way an organisation functions. **Chapter 7** outlines the second case study where the facilitation of employee voice is explored in the context of a management-driven strategy consultation process.

Chapter 7 Case Study 2: Motivation & Design (Cycle 1)

7.1 Introduction

In previous chapters, I described the initial design and deployment of the digital anonymous employee voice tool, and in turn identified the key characteristics that are required for enabling the employee voice process, as well as identifying the relevant design implications for enabling a constructive workplace discussion. Consequently, the first part of this thesis has highlighted the importance of the concepts of *progression assurance, bias reflexivity,* and *bounded accountability* in helping to sustain an environment that supports direct and informal, upward and horizontal communication, contributing towards an organisation's improvement and its ability to tackle work-related issues. However, the second and third deployment cycles of Case Study 1 addressed the employee-driven, bottom-up aspect of the wider employee voice concept. More formal, structured, top-down and employer-led processes of engagement and voicing were left out of scope, despite these being an integral part of the wider employee voice concept discussed in **Chapter 2**. **Chapter 6** explored the involvement of managers in the bottom-up initiatives and the potential for tighter engagement of this group in employee voice initiatives. In **Chapter 7** and **Chapter 8** we therefore explore the remaining facet of employee voice that involves a more structured, employer-driven, and top-down approach for addressing global and strategic issues the organisation faces, addressing **RQ2**. In this context, employee knowledge can potentially more directly influence decision-making, providing valuable input into organisational goals and objectives through the structural and employer-led process.

Specifically, **Chapter 7** depicts the motivation for and initial design process of the latest case study from the end of 2019 to the beginning of 2021, providing a summary of the activities and research investigation that led to the digitally aided strategy formulation process within the multinational research NGO (WorldFish). In this study, I refer to the strategy formulation process as the procedure

supported by Information and Communication Technology (ICT). The development of the new overarching strategy for the organisation is refined and examined by the ongoing employee engagement through its pre-existing systems, that were supplemented by a modest amount of additional technological infrastructure. In this process, the voices of the stakeholders are heard by management through the employees' perspectives, acting as the basis for validating a new strategy and informing potential changes. Overall, **Chapter 7** identifies design insights regarding the intricacies and opportunities of implementing distributed consultation practices within the organisation (employees) and with its partners (stakeholders). The approach taken in this case study extends the *mixed* approach to employee voice discussed in **Chapter 6**. The approach builds on Mahyar et al.'s [222] idea of the 'hybrid' method for data analysis of community-generated data by supporting participatory analysis throughout the organisational (employee-led and employee-driven) process, thereby adding an employee's perspective into the strategy formulation [320] and organisational decision-making.

Case Study 2 is presented in two parts over **Chapter 7** and **Chapter 8**. The main results are in **Chapter 8.** This chapter helps set the scene and outlined the original plan. First, the motivation behind the design is examined, resulting in the development of an employee-driven process for collecting stakeholders' points of view through the lenses of the organisation's employees. Second, the method for conducting activities and quantitatively analysing the survey data is coupled with how the AR paradigm informed the employee-centred sense-making and analysis. I also present the system that was developed for the initial implementation. This chapter describes the design and implementation details of the system that leverage the existing infrastructure in the organisation (Microsoft 360 in this case) and help utilise the digital tools in use (Microsoft Office, Teams, SharePoint, Microsoft Cognitive Service and One Drive) to streamline the strategy formulation process. This analysis contributes towards understanding how the organisation and workplace community can use and derive value from a structured and integrated employee voice process.

Taken together, **Chapter 7** and **Chapter 8** explore the process of addressing research questions **RQ1** and **RQ2** in an integrated manner. The outcome is a mixed top-down employee voice process within a multinational research NGO (WorldFish) across seven countries (Nigeria, Bangladesh, India, Myanmar, the Solomon Islands, Zambia, and Malaysia). This process is built on findings from the design, development, deployment and evaluation of *OurVoice*.

Based on these premises and the challenges linked to the distributed and multinational nature of the organisation, the following design goals were established to explore the potential for the enhancement of employee voice by bootstrapping a stakeholder voice and leveraging their (employees' and stakeholders') experiences in organisational decision making:

- *Design Goal 1: An alternative means of decision-making and strategy consultation within the organisation.* This means capturing stakeholders' opinion and leveraging their experiences and knowledge for organisational decision making through the distributed participatory qualitative process.

- *Design Goal 2: An alternative mechanism for the realization and facilitation of employee voice.* This means creating opportunities for speaking up and the expression of employee voice through the open (non-anonymous) participation in collection and sense-making over the qualitative data, during organisational process.

- *Design Goal 3: Sufficient digitalization and infrastructure usage for process sustainability.* This involves designing a digital facilitation of the process through the utilization of existing infrastructure and lower technical barriers.

7.2 Relevant Concepts

In this section I reflect on my initial conception of employee voice and its potential for influence on an organisation's decision-making process. Through an understanding of the inherent limitations of exclusively boot-up processes the goal is to design a mixed, employer-led but employee-driven process, that incorporates different voices, which supplements and validates management decisions.

7.2.1 Employee Voice Linkage

The overview of relevant concepts around workplace engagement focused on the provision of voicing mechanisms, allowing employees to identify discontent, and signal potential issues (upward stream). Managers can leverage employee knowledge and expertise through direct or indirect feedback channels (the downward stream). In this study, we focus on the second facet of the voice, defined as 'the means of communicating with management, having a saying in decision-making, and engaging in a workplace discussion by expressing opinion freely without fear of repercussions' (2.4). This definition implies an emphasis on suggestions and/or contributions towards relevant management decisions, with a particular emphasis on how an organisation can address work-related issues and support improvement and efficiency [97,250].

7.2.2 Organisational Strategy

Companies can benefit from developing their strategy and vision through a process of identifying values and methods of sustaining future operations, especially ones that operate over a large disjoint geographic region [247]. *Organisational strategies* usually contain different components from the organisation's declared vision, and different types of organisations have different priorities in this regard. Thus, for commercial and for-profit organisations, a strategy takes the form of financial targets or market expansion, a business plan, and specific aims to develop products or services [123]. For non-profit social enterprises and governmental bodies, the overarching vision in the strategy typically addresses the organisation's mission and the specific activities it should undertake in its pursuit [247]. Previous research has identified different paradigms and models for organisational strategies that vary based on an organisation's domain [305], the intended (and communicated) management approach [318] and other contextual factors. Though a more detailed description of organisational strategy paradigms remains outside the scope of this thesis, I refer to the relevant strategy in this case study as being a shared, social value and growth focused strategy [123,247]. Thus, in non-profit organisations, value maximisation and an organisation's survival are

not exclusively connected to financial performance only, but rather depend significantly on achieving social objectives defined by their strategy.

The strategic decisions and aims of both for-profit and non-profit organisations have implications at all levels, and manifest in decisions concerning commitment of resources and employees to achieve declared outcomes. This commitment demonstrates the importance of the strategy as a mechanism that defines the organisation, its public positioning in relation to employees, partners, and other stakeholders. Therefore, a crucial part of formulating a strategy is to ensure that the strategy adopted is feasible, sustainable, and creates sufficient and appropriate value for the organisation's stakeholders.

Strategy development is in nearly all cases an employer-driven process. Management are required to ensure that a strategy is supported and validated by a high-quality analysis [43]. Commitment to a strategy includes ensuring that necessary organisational and technological changes, as well as other activities that flow from the strategy, are implemented. Feedback on the strategy and the overall process needs to be collected to ensure it is adequate for the context in which the organisation operates, which itself requires a degree of engagement with external stakeholders. Thus, organisations that embark on a strategic planning journey typically seek engagement of stakeholder within, or affected by, the organisation's operations [195]. Stakeholder engagement is of particular importance for non-profit organisations. Their social capital is a major and influential part of organisational identity, which in turn has a significant bearing on access to funding and willingness of external agencies, organisation and communities to collaborate with them. Here, 'engagement' means the direct involvement of stakeholders in discussions that seek to provide insights and information to both generate and validate the strategy. Typically, engagement of stakeholders through direct involvement includes interviews, workshops, focus groups and task-forces [346]. However, these methods are difficult to realise within geographically highly distributed organisations that work across several global locations and regions. Furthermore, the existence of different departments, the decentralisation of offices, and differences in organisation infrastructure (including ICT) introduces additional sets of barriers to collaboration.

However, these barriers to traditional strategy formulation approaches, and their associated forms of stakeholder engagement, constitute an opportunity for a reformulation of approaches to strategy development that incorporates employee voice. Recognising the distributed nature of an organisation as an opportunity, rather than an encumbrance, implies foregrounding the value of the local knowledge and the (local) social capital of the diverse workforce. Developing methods that leverage this local knowledge and social capital is the focus of my second case study. The challenge of aggregating contributions from multiple distributed participants within a collective action, has been extensively addressed in social computing and is generally referred to as *crowdsourcing* [320]. In this case study I have taken inspiration from previous work in this area and endeavoured to design an approach that can span different geographies and levels of organisation(s), and involve participants with different skill sets and expertise. In Section 7.3, I describe the design of a process that operates over the region- and country-level, in which tasks range from those that require management of the process, to micro-tasks that need to be done 'in the field' or require a specific knowledge and skill-set (translation, interviewing, classification) [195]. At the same time, I have sought to leverage a 'lowest common denominator' technical and organisational infrastructure, that is, to design a process that can be delivered using the established ICT and management processes that are already part of employee's day-to-day work practice [57].

7.2.3 ESN Limitations and Leveraging Existing Infrastructure for Idea Generation.

One common criticism of ESNs and the reason for low levels of engagement (other than the factors discussed in subsection 3.3 that affect their affordance [57,136]) is the perceived notion that they are 'yet another thing to do' with no clear value proposition for the employee. We witnessed this reaction in Case Study 1 (outlined in **Chapter 5** and **Chapter 6**). Indeed, Chin et al.'s work exploring the factors that influence the (non-)use of the ESN in organisations identified the problem of introducing and integrating a new tool within a workflow that already exists. Concerns around data security and preservation of confidentiality are also

inhibitors of ESN usage, although we explicitly addressed this issue by introducing secure and anonymous communication channels (**Chapter 5**) and extending governance and operation of employee voice processes to employees (or their representatives) themselves (**Chapter 6**). ESNs can also have an steep learning curve [176,223] requiring employees will to adapt their working habits and potentially change their routines and practices [205].

Thus, the principal issues associated with ESN usage can be summarised as: *(i)* issues related to user experience; *(ii)* the requirement to change collaboration norms and work routines; and *(iii)* that the information accessible through ESNs can be overwhelming. In contrast, I decided to explore how to engage with employees through the infrastructure that underpins their everyday work practices, with a view to flattening the learning curve and not disrupting participants' communication and collaboration patterns. Previous HCI research in a health-related contexts has demonstrated how this approach can be beneficial [219]. Where MacLeod et al. found that in-person interviews and communication were not an option, they engaged with a distributed cohort of participants without introducing a new digital tool or platform; instead they leveraged private Facebook groups which were familiar to the large majority of their participants. MacLeod et al. demonstrated the feasibility of conducting collaborative design activities using this familiar digital infrastructure and asynchronous remote communication. This approach was shown to be successful in a number different settings by the same researchers [218,220] and others [285]. Despite the success of the approach, a number limitations of the social network were identified, including participant and researcher uncertainty as to the Facebook algorithm for notifications.

In earlier research, Stevens et al. analysed the appropriation of technological infrastructures, including how they can be integrated into the specific application and processes, allowing digital technology scoping and facilitating the collaboration [319]. Researchers have focused on the relationships between the collaboration of participants and the technological infrastructure that supports such appropriation. Stevens defined two factor that influence the appropriation of a technology by users. Firstly, he concluded that knowledge sharing amongst users of a new technology (or digitalised process) should be facilitated during the

appropriation. Secondly, clear communication between users and designers/developers of the new technology or digitalised process should be in place.

Indeed, Lambton-Howard et al. developed and conceptualised this further under the banner of *un-platforming* [196] in which existing "platforms" (e.g. WhatsApp, Facebook etc.) are considered as materials that can be utilised to design and implement digitalised processes to enable coordinated participatiopn. Instead of building yet another new and 'bespoke' system for addressing specific issues of coordinated participation, they developed a model of an un-platformed design process which employs the materiality of an existing and widely used platforms [196]. This case study incorporates the notion of appropriating existing technologies [319] and un-platforming the design [196] of a strategy formulation process using crowdsourcing [320] as the means to realise employee voice. The following subsections describe a case study conducted over two years (due to the COVID-19 pandemic situation and corresponding organisational challenges) with stakeholders of the international NGO over six countries.

7.3 Design Process (Plan)s

As in Case Study 1, the AR approach was taken across all stages of the study, introducing an iterative design and implementation of digital prototypes and processes. The same set of design and embedment principles as set out in Case Study 1 informed the development of the process and digital prototype. At the same time, the international and distributed contexts shifted the research focus to a formal and structured process with direct employee engagement by way of the provision direct participation through the collection of feedback from stakeholders and their implicit input through these activities.

7.3.1 Motivation and the Context of the Study.

The main focus of this case study was to explore and facilitate the organisation's strategy formulation process. The process was designed to address pre-existing issues in taking into account the voices of marginalised groups, addressing

management engagement and providing and responding to feedback to drive the process forward. The premise of this case study was to formulate a new 2022— 2030 organisational strategy for an international NGO (WorldFish) in a way that employs participatory research processes and adheres to the notion of AR. At the same time, the process needed to be incrementally designed and developed, providing the ability to leverage knowledge and experiences of (unconventional) stakeholders while building upon the existing infrastructure of the organisation (un-platforming) using existing communication channels. At an organisational level, active staff engagement in defining the steps and procedures for the process was allowed, involving them in the execution and sense-making stages.

WorldFish is an international not-for-profit research organisation that focuses on creating and advancing research on aquatic food systems into more generalised and scalable solutions. As a Consortium of International Agricultural Research Centres (CGIAR) member, WorldFish collaborates with different international institutions and organisations that focus on food security research. WorldFish has offices in 20 countries throughout Africa, Asia and the Pacific [367]. The key assumptions for the strategy included concentrating on valuing and enhancing the role of fish in transforming global food systems and accounting for the knowledge and experiences of people in the field.

Compared to the previously formulated strategies, the uniqueness of this strategy consultation process was the degree of collaboration and engagement with the organisation's employees during the designing and conducting stages. The premise of this process was that the future direction and areas of aquatic foods research and development were influenced by local stakeholders, who then informed and shaped country-level planning and priorities for 2022—2030 (local, region and country-wide strategies). A participatory action research approach aided by digital technology (as the main means of communication) was undertaken to accomplish this goal in an organisation scattered across different countries. Utilising the existing platforms and software within the organisation (Microsoft 365 platform), according to the 'un-platforming' [196] and 'appropriation' [319] methods, helps contributes to the learning and technology process for shaping future stakeholder engagement and processes within the organisation.

The first objective of this research project is to gain insight into the design process. The strategy formulation process should incorporate stakeholder voice; this can be achieved through leveraging the existing infrastructure and processes. The second objective is to evaluate the prototype of the digital stakeholder voice process and consider the degree to which it is embedded within the distributed organisation.

7.3.2 Design Consultation.

The proposed concept of the process arrangement was informed by the previous studies [1], as discussed with the mixed research team. From these study findings, the initial set of consultations with the management team at WorldFish headquarters was held to understand the existing technological infrastructure, as well as the organisational infrastructure, hierarchy and processes established and used within the company.

7.3.2.1 *Management Consultation (Plan)*

As shown in **Chapter 6**, engagement with management is crucial for ensuring that the process involves employees' participation in decision-making. This engagement essentially reflects the strategy's main purpose as a declared document defining organisational direction for a certain number of years [368]. Thus, the steering committee (SC) for the strategy formulation process was formed. The SC consists of four management representatives and two researchers and was created to inform the *Plan* stage as outlined in Figure 23 of the three-fold process of *Plan-Act-Reflect* from the AR iteration [5]. Similar to Case Study 1, the design process was considered an iteration of the bigger AR process. The consultation with management and formation of the initial SC contributed towards planning the participatory design activities with the staff members and stakeholders. The committee aimed to govern and drive the design and prototyping endeavour forward. In so doing, it was necessary to explore the context in which the organisation was working, the workplace power dynamics and organisational structure distributed across countries where it operated through preliminary consultation with the management team.
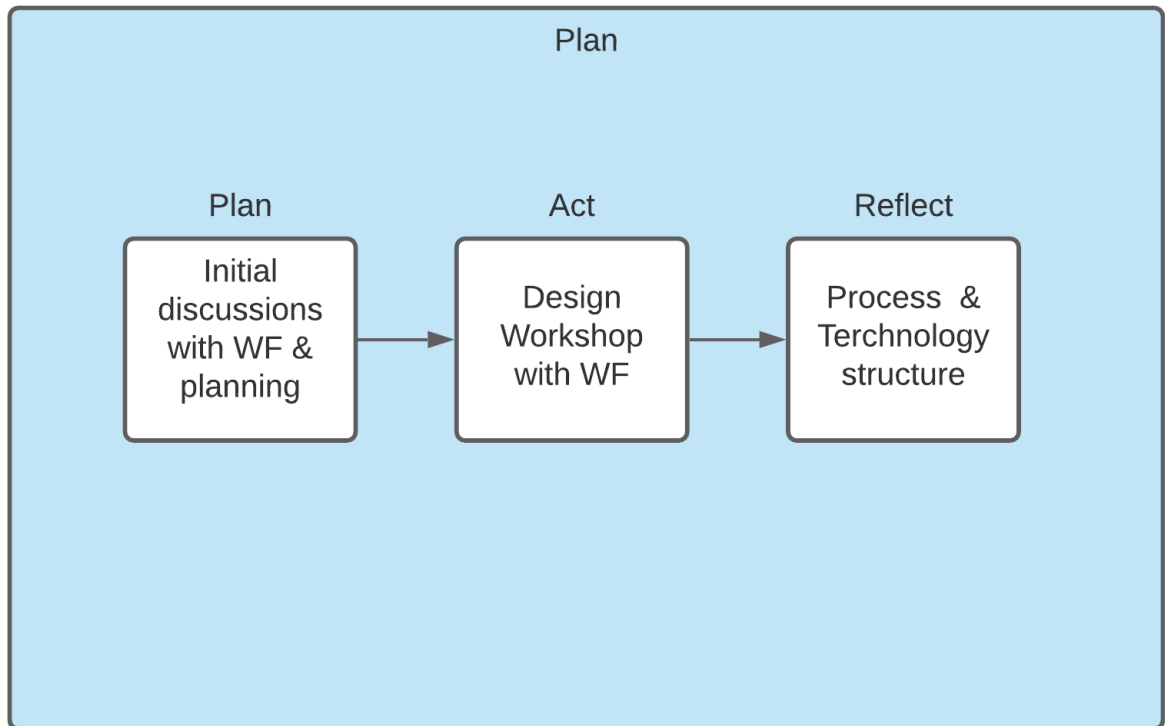
Figure 23. An illustration of the Plan-Act-Reflect stages of the designing the strategy formulation process.

During these meetings, the suggested scope of the strategy formulation process was determined according to the following identified limitations and requirements:

- Accounting for the diversity of context and environment in which international NGOs are working.
- Working across the organisation's geographically distributed offices, with employees across more than seven countries in Asia, Africa and the Pacific.
- Recognising the limitations of previous formulating strategies, their detachment from the regional and country-level strategies and issues that these offices face.
- Including marginalised (unconventional) groups of voices identified in previous case studies).
- Engaging management in the process more by providing a sense of ownership and responsibility while supporting the transparency of the collected data and connection to its source.

- Engaging employees while addressing the potential fear of consequences, providing feedback regarding identified concerns for driving the process forward, and providing a sense of ownership and a clear path to affect the process.
- Acknowledging the limited availability and time of involved parties (management and employees), hence the necessity of workload distribution and automation.
- Distributing the necessary workload across the offices and countries for better coverage and minimising additional burden (extra-work) for employees.

After discussions with the SC and establishing the scope and limitations of the project, a structure for the design process was identified, as in Figure 23. The Act stage of the Design process took place during the Science Week event in Penang at the organisation's headquarters. For my research and this case study, it is important to note that this is a biannual event with the purpose of gathering representatives and country directors from all the offices and countries where the organisation conducts their work and includes the presence of stakeholders and partners of the organisation. Based on the 'Plan' step of the designing phase, the idea of an agile and iterative approach was proposed as the recommendation for the process organisation.

7.3.2.2 *Employee and Stakeholder Consultation (Act)*

A biannual WorldFish Science Week event was chosen as the venue to conduct employee and stakeholder consultation. I attended this event planning to conduct a workshop and interviews as part of the design stage of the process. A mixture of workshops and interviews was used to cover different aspects of the organisational process (from the employee voice perspective) and allow stakeholders of the organisation to influence and take part in both the process design and execution (Figure 24).

Figure 24. WorldFish Science Week Workshop that took place in Penang, with 20 participants.

A further limitation was that the Science Week event only lasts for five days, with an existing schedule and activities. Thus, the interviews were conducted with the employees of the Penang headquarters, as they lead organisational operations and directly communicate with offices in different countries. The workshop was used to introduce country offices to the strategy formulation approach, discuss how it can be organised and identify issues the participants face in the field and strategic priorities for the organisation. Meanwhile, interviews were used to 'drill down' in more detail with specific individuals in more confidential settings. The workshop was facilitated by activities designed to set a context and help participants organise the strategy formulation process from their perspective. The workshop was conducted with paper and purpose-designed play cards shown in Figure 25.
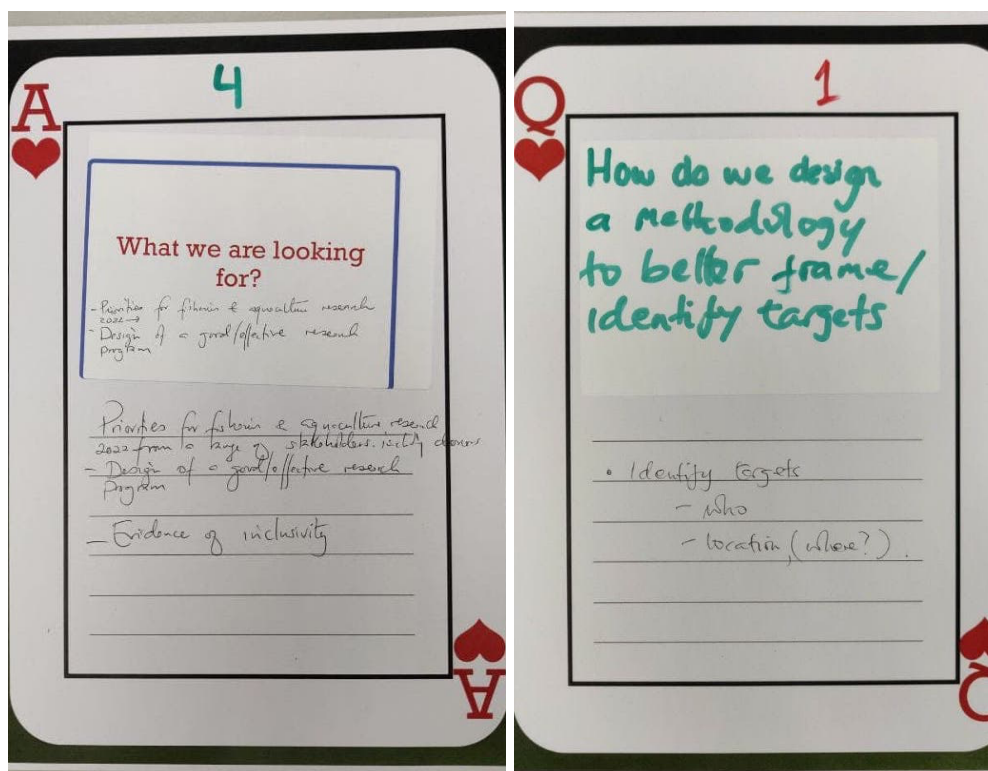
Figure 25. Example of the play card used for workshop.

The intention behind the workshops and interviews was to inform the design of the strategy formulation process from the employees' and partners' perspectives and acquire additional knowledge regarding the functioning and structure of WorldFish.

Workshop

The workshop's primary aim was to design, evaluate, and analyse the strategy formulation process for WorldFish to 2030. To do so requires discussion of how this endeavour can be facilitated based on the existing infrastructure while leveraging the experience, opinions, and knowledge of conventional and unconventional stakeholders. The workshop allowed the participants to understand their perception of the main problems that exist in the regions where WorldFish offices and partners are operating. The 20 participants were divided into four groups, and each group was assigned a specific task. In line with the AR approach, the organisation's distribution over several continents and consideration around the previous consultation with the management, an iterative method of organising strategy formulation and consultation was proposed. It involved the Iterative Design and Agile execution, where each subsequent stage of this iterative process

depends on the outcomes of a previous one. Based on consultation with management, the following four potential stages were assigned to each group:

- **Design:** this refers to the activities that help plan and design each iteration of the strategy consultation process.

- **Conduct:** this refers to the data collecting stage that involves employees' interactions with stakeholders.

- **Making sense:** this refers to sense-making by employees, discussions, or verification.

- **Aggregation and Analysis:** this refers to management involvement and other sense-making activities on a higher level, potential decision-making that can inform the strategy of following iterations of the same process.

Each group had six cards: Inputs of the stage, Outputs of the stage, Ace, King, Queen and Jack, as in Figure 25 and a set of sticky notes with some pre-defined questions and blank sticky notes for new questions. The groups were each asked to discuss what their stage (Figure 26) might involve, what inputs were required, and what outputs they should produce.

Design	Conduct	Making Sense	Aggregation & Analysis
1	2	3	4
Scope, guidelines, plan, and instruction to act upon.	Data collecting, employees' interactions with stakeholders	Sense-making by employees, discussions and verification	Overarching analysis, results aggregation, decision making

Figure 26. This figure outlines the four stages of the investigatory process, namely Design, Conduct, Making Sense and Aggregation and Analysis.

Additionally, they were asked to rank the issues and questions (using cards with different priorities) and come up with the main questions and answers for the stage they were assigned. Thus, the question on the Ace card renders itself as the most important for the stage under consideration. The duration of the workshop was two hours. It resulted in the following findings for each of the stages of the process.

First group: Design stage. The discussion around the Design stage quickly arose from the necessity of addressing non-conventional stakeholders outside the usual network of the WorldFish offices, including partners from the academic, government and private sectors. This requires a broad search through the various sectors and scoping throughout the different levels, from country directors and executive teams of partner organisations to employees, researchers, and fishers. Participants suggested that the vital point of this stage is to understand what kind of methods and approaches are needed for a better representation of country and global level stakeholders. That is, including both the organisation's traditional stakeholders with whom they are usually interacting and new people to support the emergence of new perspectives and the development of more comprehensive ideas. In so doing, the resulting process and strategy become more attractive for stakeholders themselves and should allow for identifying knowledge gaps within the company.

Participants have concluded the importance of designing steps for the follow-up stages (Conduct, Tag, Analyse) to provide them with the guidelines, plan and instructions to act upon. The indicated emphasis on designing steps resulted in a need to come up with the 'research framework' for the process that will cover all the important aspects for better coverage of the consultation process. These include identifying the main topics for each iteration, the relevant stakeholders to prime, their priorities to analyse and additional data (quantitative data, previous research) to use. A call emerged to prioritise who will be involved in the process (who these new people are), as well as which thematic and research questions need to be prioritised. The discussion concluded that there is a wide variety of questions and that they will not address all of them, so a method to prioritise the focus is needed. In addition, a conceptual framework can be utilised for the next stages to design the questions and target and define the work, as well as which people should be involved in it.

Second group: Conduct stage. The discussion around the second stage highlighted the importance of a well-structured process and the availability of guidelines, protocols, and provision of tools from the previous stage. Participants assumed that this would help conduct activities and manage the process for a

smoother and less distracting execution. Various techniques for capturing stakeholder perspectives, including Key Informant Interviews (KII) to workshops, remote meetings and less structured interviews and chats, were proposed. In line with the previous group (who discussed the Design stage), they highlighted the importance of leveraging different views and addressing different levels and stakeholders, including all input ranging from a higher level (science leaders, ET) to lower levels (workers, researchers and farmers). The most important factor was to concentrate on understanding what should be captured and how to comprehensively capture the issues around the topics agreed upon at the Design stage. These included the importance of learning about the national priorities and policy directions, the programs of donors and their priorities, exploring the future trends and scenarios and understanding potential impacts of sustainable development golas (SDG). Conversely, capturing should be spread across all levels, from higher-up (global and regional meetings, dialogues, and workshops) to national and community levels.

Like the discussion around the Design phase, workshop participants agreed that the process should particularly focus on stakeholders from the government, public and private sector (including society, NGOs, consumers, academics, etc.) to capture their point of view and understand their priorities. When it came to a consideration of how to capture conversations with stakeholders and in what format this data should be produced, the wider workshop discussion resulted in the following alternatives being suggested:

- Chat, dialogues, and a normal conversation to make stakeholders comfortable, providing the sense of the normal, informal interaction.
- Interviews/voice clips/video clips as a more formal and structured approach to capture the voices.
- Focus groups on cases where employees in the country offices have time limitations and cannot have a discussion/interview with all of the partners separately, although this approach is potentially prone to silencing and inhibiting voice.
- Town Hall meetings, similar to the previous option on a bigger scale.

- Participatory online tools or phone calls as an alternative to chat, interviews or focus groups, where direct communication in the real space is impossible (as became clear during the COVID-19 global pandemic).

Also, the participants reiterated the importance of informing and making this process clear to participants and potential interviewees in advance by providing presentations and engaging in dialogue before interviews and other chosen approaches.

Third group: Making sense stage. During the discussion of this stage, participants specified that stakeholders with different perspectives should be involved in this task. Thus, the undertaking of the data analysis process should be distributed among many actors and approached in a participatory manner, essentially producing key priorities and groups of topics according to global trends and interests of stakeholders (e.g., donors, partners, government, private beneficiaries).

The aggregation and grouping could be accomplished based on stakeholders' backgrounds and the themes that need to be tackled, essentially narrowing down the priorities. Understanding the global trends identified at this stage will help validate and frame the strategy based on key priorities recognised and concerning different stakeholder groups. This group of participants focused on who will be beneficiaries and how to work with them. During this discussion, participants emphasised that the new strategy should represent unconventional stakeholders and employee voice. The suggestion was to actively involve employees from all stakeholders to analyse outputs from the conducting phase.

Within the workshop, participants also supported involving different people in conducting activity and making sense of its outcomes. Where employees cannot assign many hours or do not feel particularly strong in their sense-making skills, they proposed organising group activities to help with the sense-making and get a wider angle on the data. This supports the discussion around the Design stage and outcomes of the Plan step (Consultation with management) that resulted in the idea of broader participation and inclusion. Sense-making should not be done by one person and should be distributed among different people. The approach should

also not be a top-down approach; employees should have a say and cross-validate the produced results and data. Participants also indicated the importance of normalising results and being aware that some of the interviewed stakeholders can become very ambitious.

Overall, participants concluded that, depending on the input format from the conduct phase, they would like to see qualitative data produced from the sense-making activity, with the potential to produce quantitative results at a later stage. These outputs were exemplified by derived tags and key topics from the discussion or interviews, words from the interviews and descriptive text aggregated and analysed.

Fourth group: Aggregation and Analysis stage. The discussion regarding the last stage of the process resulted in including several points that participants thought were critical. Not only should the results of the previous stages act as inputs for the next, but any other relevant external sources (according to the identified topics and aims of the iteration) and the overall vision of the organisation (previous strategy, regional and country-level strategies) should also serve as inputs. The emphasis was upon exploring how the information they will get through the consultation corresponds to the organisation's mission, and if this data is in line with what was already collected. If not, the information should be researched further to understand the source of disparity and the potential for identifying new and maybe unconventional goals.

The idea of clearer organisational priorities resulting from this process has emerged as one of the potential benefits. Participants concluded that this stage could help validate the priorities and internal organisational processes at national and international levels. Therefore, the connection between the aquaculture private sector, WorldFish's regional offices and aquaculture research institutions, is streamlined, making the flow between researchers, fishers, external stakeholders, and organisational donors more transparent. According to the participants, the process's premise should be to help design an effective research program and provide evidence of inclusivity (or in the alternative, the absence of inclusivity so this can be effectively addressed going forward). In their opinion, the

other questions to address at this stage (apart from identified topics and key factors) are also of a more organisational nature, including questions of how to combine potentially opposing views and position the organisation's strategy in a development sector based on findings. They have suggested that the Steering Committee (SC) for this stage should include executive team, country directors and donors where necessary.

The converging of the process should be calculated based on time constraints and sufficient coverage, something that the committee should determine. As the last step, the committee has suggested that it would be beneficial if an independent party could gather data and produce outputs to prevent potential biases. Potentially, these could include higher-level stakeholders (such as the executive team) to work with the resulting data, as well as some donors and country directors to obtain a perspective from a different viewpoint.

One interesting point that led to some debate during the workshop is when and how the process should be finished. Some participants have suggested stopping when the consensus on what needs to be done has been reached. Others thought that they misunderstood the idea of the project. In reality, is mainly about analysing and gathering broader data from the employees and external stakeholders who were not previously involved. The project can generate diverse data that provides different people's visions on strategy and can be potentially difficult to converge or easily agree upon. The participants have suggested aiming to cover most priorities and most important missions, based on the data produced and opinions collected, that can be identified in the Design stage of each new iteration. Participants have emphasised that the consultation process needs to have an effective program and provide evidence of inclusivity from all stakeholders. At that point, all the data can be provided to the SC to either produce a better strategy or validate the existing strategy against the collected data Outputs can either be integrated into the strategy or its validation process or used as a basis for the new iterations of the process.

The discussion of this strategy consultation process provoked further deliberation among participants, which resulted in questions that need to be

addressed to 'realise the full potential' of this or comparable procedures. Similarly, the concern raised by one of the groups is the overarching issue of 'marrying produced evidence and views' from different regions, groups, and the historical data organisations already carry from their existing projects. This focuses the outcomes on the issue of applicability and potential conclusions to be drawn about real life. Likewise, the participants indicated that before the iteration or process starts, it would be critical for the organisation to position itself in a development sector and, during the design process, try to design all the stages based on that starting point. The participants suggest that the foundation countries, where the organisation already has a presence, could act as a base for the process. Finally, the participants highlight the significance of taking results, outcomes and, more importantly, the gleaned knowledge, understanding, and vision and transforming them into an organisation's program that can form the basis of action.

7.3.3 Planned System and Process Structure (Reflect).

The previous *Design Consultation* subsection documented participatory activities to explore how the strategy formulation process can be organised in the distributed environment leveraging existing technology and infrastructure used within the organisation. At the same time, exploring how to facilitate stakeholders' inclusivity and employees' participation at every stage of the process. The data collected across this endeavour informed the design of the process prototype, divided into four stages to explore the process flow and consideration around each stage in practice. I refer to the process prototype as *OurStrategy*, a digitally aided process designed and developed as an outcome of the design activities, encompassing the complete strategy formulation workflow in the iterative (cycled) manner. This process aims to make participation for stakeholders in each iteration and stage as flexible and inclusive as possible. Thus, the design of *OurStrategy* responds to the challenges identified and adheres to the following principles:

Fully contained end-to-end coverage. *OurStrategy* builds on the premise of full coverage of the consultation and stakeholder engagement from the initiating step to delivering outcomes, based on the previous study [1], identified limitations of ESNs [57,176,223] and infrastructure and technology appropriation

research[218,319]. Along with the notion of providing the capability to rerun the process (in the next iteration), the results produced from the previous iteration (or stage) can act as inputs for the following iteration, lowering the resource and data management requirements and decreasing cost barriers through the usage of the existing infrastructure.

Stakeholder Voice Prioritisation. *OurStrategy* was designed to be based on the stakeholders' voices and reflect their views and suggestions. Unlike other similar strategy formulation processes, *OurStrategy* focuses on participants' voices and makes them a central concept for design, analysis, and decisions. This reduces the number of layers of interpretation by creating a direct and transparent channel of communication and maintaining relevance to the data source at any level of organisation.

Flexibility and Technology Agnostic approach. Similarly, to Case Study 1: Employee Voice Process, Embedding), no decisions are made for participants during the design of the *OurStrategy* process around consultation workflow. Thus, the exact activities of each stage remain flexible for all stakeholder groups and depend entirely on the design stage of each iteration. Moreover, the whole process is built around the assumption that each organisation can adapt it based on the infrastructure it uses.

7.3.3.1 *Process Overview*

The goals and objectives of this process are to organise and engage in a comprehensive consultation process to hear the opinions, challenges, and perspectives of different stakeholders and partners currently working with the organisation at different levels. The overall goal is to make consultation more comprehensive and closer to the actual needs of its stakeholders at different levels. These stakeholders include fishers, producers, researchers, government representatives, donors, and others. It is hoped that the broader discussion and provided inclusivity will reflect the knowledge and experience of both 'conventional' and 'unconventional' organisation stakeholders.

From the organisational perspective, the following design considerations were derived from the principles of end-to-end coverage, flexibility, and voice prioritisation:

- Design the process that helps identify, scope, and include previously omitted groups ('unconventional' stakeholders, underrepresented partners) to surface and address their perspectives and concerns.

- Leverage the experience and knowledge of staff and researchers to reflect their opinions through the input they will have in the process, relying on them to engage in interviews and reach out to partners as part of the process's distributing effort and participatory nature.

- Implement the process to help effectively identify and assess the organisation's priorities based on stakeholders' perspectives.

- Develop the structure to identify challenges and issues for addressing or tackling during upcoming iterations.

- Implement a sustainable and self-governed participatory process to obtain insights, concerns and suggestions from stakeholders and partners from all levels.

- Account for existing supplementary data and infrastructure to design technological support of the process.

- Leverage the existing organisational infrastructure for automation of the process in a way that allows the overall process to be technology agnostic and repeatable.

Assets and Resources

For this case study, the managers' and employees' consultations identified the following broad groups of organisational actors and resources to engage in the process and be utilised in this scenario:

- *Infrastructure (Digital)*: MS Teams and Microsoft 365 platform, Skype for Business/Teams and OneDrive for facilitating this process at a distance.

- *Infrastructure (Physical)*: Video Conference Rooms and meeting rooms for designing the process, analysis, potential workshops, and brainstorming.

- *People (Leadership)*: Executive team members, country directors and lead scientists as a SC for design and analysis stages.
- *People (Researchers)*: Researchers (RS) and scientists as interviewers and interviewees.
- *People (Stakeholders)*: Stakeholders (ST) and partners as interviewees.
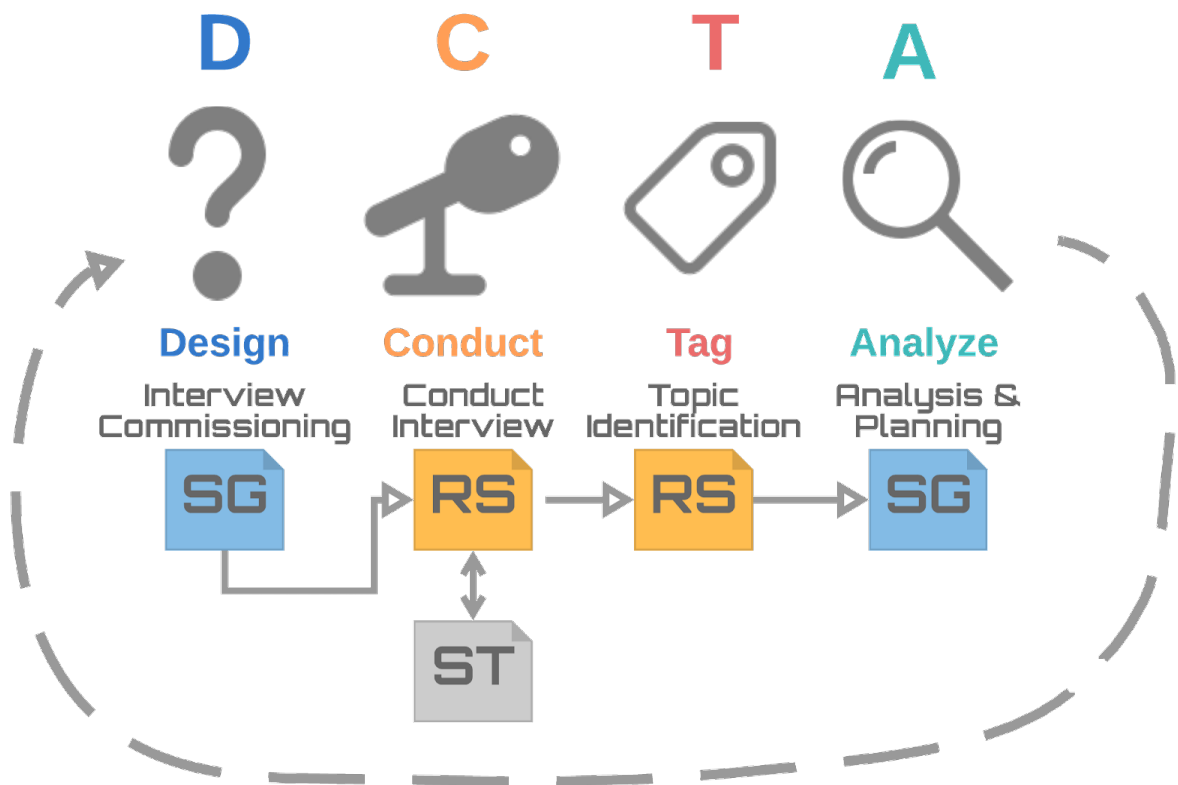
Figure 27. Strategy formulation prototype design. SG (SC) – Steering Group or Steering Committee, RS – Researchers, ST – Stakeholders.

Based on Figure 27, the initial prototype of the process was designed to consist of several iterations. Each iteration was divided into four stages, following the outcomes of the design workshop:

- *Design*: The SC gathers for planning, topics, and problem formulation. This also includes scoping, understanding the resource use and involvement of people.
- *Conduct*: The RSs carry out activities such as conducting interviews and gathering statistics and metadata of each activity. This also involves providing a preliminary summary for each activity for refinement of the process as it proceeds.

- *Tag*: The RSs engage in the participatory-based analysis stage, accomplishing raw data analysis, distributing workload and gathering refined statistics and data.
- *Analyse*: The SG identifies emerging topics from data, prioritises and grouping and areas for more exploration, and involves supplementary outside sources if necessary. This involves discussing findings and producing media-rich documents (reports) for this iteration and deciding on the start of a new iteration or finishing the process.

Subsection 7.3.4 elaborates on the technological aspect of the process and the system that facilitates the strategy formulation process, describing the architecture and technological backend that supports digital agents and interacts with the users. For more a detailed overview of the initial design of the system please refer to Appendix F. It highlights the initial design decisions associated with each stage, grouping technological and organisational measures through the iterations and stages (designing, conducting, tagging, and analysing).

7.3.4 System Architecture

The *OurStrategy* process is composed of two high-level technological solutions. They are *(i)* a backend solution consisting of microservices that govern the logic and execution of the process and each of the iteration and stages within them, and *(ii)* a frontend interface in the form of the Digital Agents (bots) for SC members and involved employees (RS), where the data collection, processing, analysis, and workflow events occur.

- *SC Digital Agent* (MS Teams Group ChatBot): This is the SC-focused Digital Agent used for communicating with the SC members for initialising, configuring and starting an iteration or stage. By default, it is technology agnostic, not tied to a specific messenger and was tested to be working in MS Teams (as WorldFish uses it) and Telegram (as an alternative and open platform).
- *RS Digital Agent* (MS Teams Personal ChatBot): This Digital Agent focuses on communication with the participants involved in the

conducting stage. Similarly, the SC Digital Agent is technology agnostic and can work with many messengers (tested in MS Teams and Telegram).

Figure 28 outlines each of the stages within the iteration, with the corresponding technological components of the *OurStrategy* system.

The *OurStrategy* frontend interface provides users with information relevant to the stage, captures their feedback and inputs, tags collected data, and facilitates further execution of the process. It also provides the ability to upload necessary documents and recordings through one interface familiar to the users (MS Teams, Telegram and other messengers used within the organisations). At the same time, the backend does all the work on logging and storing collected data, preparing it for the analysis (transcription and topic identification), extracting the identified tags and topics, and aggregating the results. The process is enhanced with the automation and transferring routine, time-consuming tasks, such as transcription or translation.
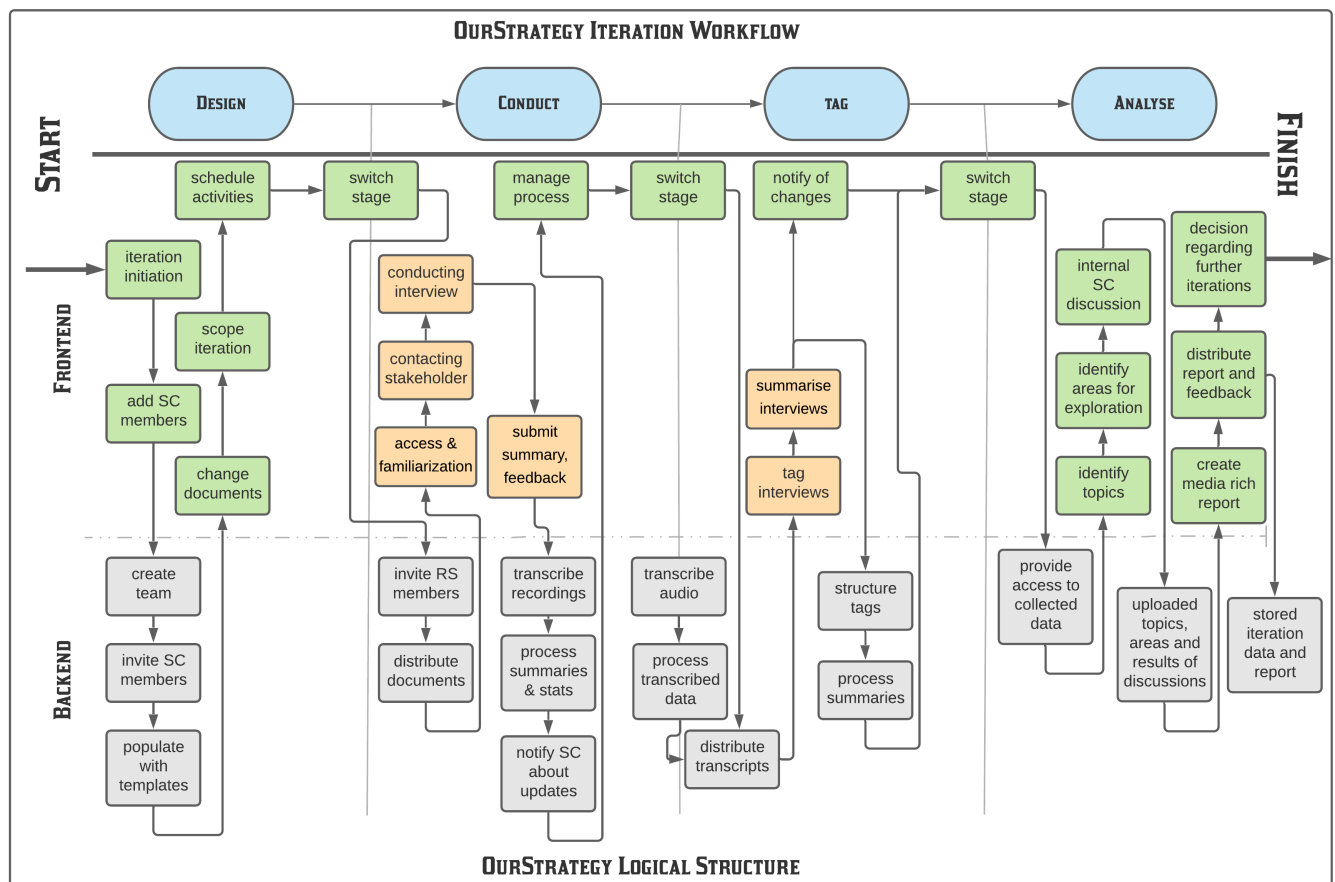
Figure 28. OurStrategy Logical Structure to Process Workflow.

The system represents an open framework for consultation organisation that translates into a digital tool (as one of the options on par with the manual execution) that is composed of four technological components (stacks) that can be deployed in the cloud environment (if needed):

(i)   a backend server running an application that oversees the execution logic of the process and supports the designing, conducting, tagging and analysis stages

(ii)   the SC Digital Agent (Group Bot) and RS Digital Agent (Personal Bot) for interaction with the SC members and employees who are conducting the activities, as well as providing necessary material and documentation and collecting feedback

(iii)   a RESTFul Application Programming Interface (API) to provide integration of the backend and the frontend interfaces

(iv)   external services for storing progress, logging data, transcription, NLP, and analytics.

The separate components that give an additional level of flexibility and transferability to the system are containerisation for all the backend services to streamline the process of deployment and development. The discussion below outlines each component's system architecture and technology decisions and illustrates their interaction with other internal or external components.

A microservice architecture as an approach for bundling the system was chosen to streamline the development process and follow the functional division between the components, supporting the easier configuration, deployment and scalability of the system in different contexts. The containerisation technology used is Docker: this was run in the Microsoft Azure cloud as the environment. Separate services are each encapsulated in the corresponding image of the container to run and exist in a lightweight, standalone and isolated package that includes the codebase and all dependencies for running a service, including a virtualised operating system [95]. Thus, API and backend application images were created in corresponding isolated codebases to provide a standard and portable way to run the code on any machine to increase the scalability and

flexibility of the solution. Additionally, a containerised approach implies deploying the fully independent instances of *OurStrategy* that do not conflict with each other and can work in separate contexts (organisations).

The system was deployed in the Microsoft Azure cloud infrastructure because of the necessity of having a scalable and easily configured environment for the containers and data storage, shown in Figure 29. Another aspect driving the choice was the existing WorldFish infrastructure and Microsoft products' use in the organisation, providing easier integration with the organisation's digital ecosystem. Finally, Microsoft Azure integrates with the Boatbuilder SDK that was used to define and develop the Digital Agents workflow logic on par with outbox connectivity with MS Teams, Telegram and other instant messengers. This support is achieved by utilising the Azure Bot Service, enabling intelligent enterprise-focused digital agents to provide ownership and control over the data and its flows [356]. The key aspect that influenced the choice was open-source SDK and tools that allow developers and organisations to link the digital interfaces we created to a variety of existing digital channels, providing an ability to reach users through the most comfortable and familiar means of communication (a key objective for achieving the un-platforming effect of the facilitated process of strategy consultation). Additionally, it brings the capability of the native integration with Azure Cognitive Services that facilitates the recognition and translation of the written text or spoken language [362].

In practice, Digital Agents run in their isolated containers on Microsoft Azure infrastructure (Figure 29), connected to the backend service through the RESTful API that both run in the same cloud space (the same Resource group in Azure terms). This not only allowed more rapid deployment and scope for vertical scaling through the possibility of adding more RAM and CPU to each instance under load, but also horizontal scaling by allowing a co-ordinator (on demand) to spin up new instances of the containers and load-balancing incoming traffic between them. This eventually gives an ability to balance costs, resilience and availability while simplifying operational support.
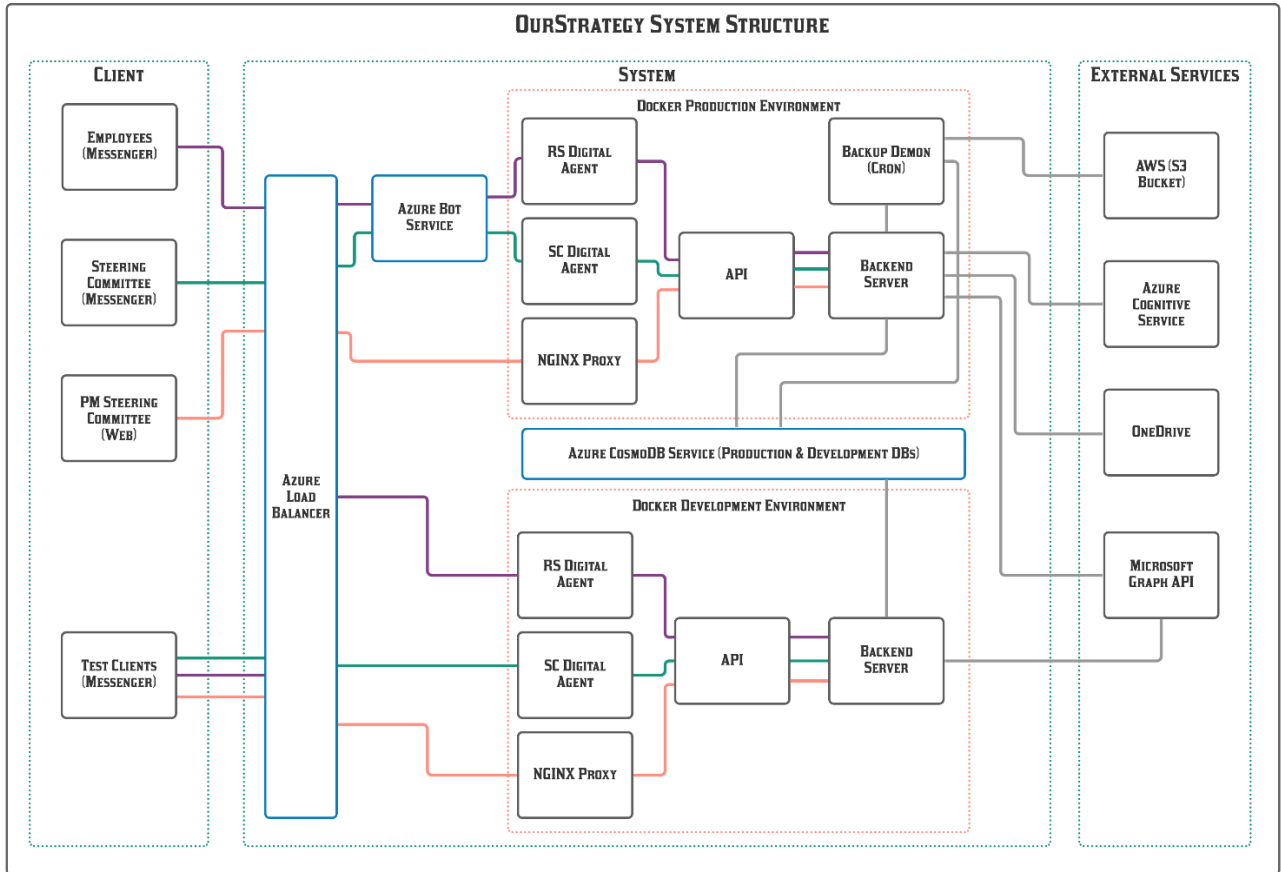
Figure 29. OurStrategy System Architecture.

Considering the scaling possibility and potential of running several system instances in one cloud infrastructure, all external traffic that arrives from the clients (users of Digital Agents and Reporting Interface) goes through an Azure Load Balancer [363]. This acts as an API gateway between clients and services, forwarding all requests to the correct instance of application and container as in Figure 18. Similarly, storage components emphasise high availability, focusing on distribution, replication, and multi-region presence due to the potential distribution of clients and corresponding backend components. The Microsoft Azure Cosmos DB was chosen as the database service addresses all these requirements, guaranteeing single-digit millisecond response time and 99.999 per cent availability [358]. The Azure Cosmos DB service is used to hold each organisation's database and process in a non-Relational database (NoSQL), each connected to the corresponding instance of the backend container. In line with the idea of flexibility and a technology agnostic approach, the Azure Cosmos DB service was chosen because it provides an open-source API for MongoDB: an open-

source non-relational database that can be run as a separate instance (e.g., in internal organisational infrastructure). This allows the system to be deployed outside the Microsoft cloud infrastructure on a different cloud provider or on internal, private servers (virtual machines or bare-metal ones). The only part of the system with limited transferability is the part of the Azure Bot Service that connects the Digital Agents with the various channels and instant messengers (MS Teams, Telegram, Facebook). Although it is possible to re-write this component to make it more infrastructure-independent, it will limit its connectivity with MS Teams. However, due to the usage of the Microsoft Infrastructure in this case study (and the WorldFish organisation), and the provisioning of all of the advantages in terms of maintenance and operational cost, the decision was made to accept this limitation.

For additional resilience and to address potential technological and infrastructure issues, a separate container with the Cron job was spined up to do a nightly backup of the databases to Amazon S3 (a different provider is used to address concerns for a separation and safety mechanism). With the same notion in mind, a separate instance of the RESTful API, Digital Agents and non-relational database were spined up for development and testing purposes to isolate production-ready and development parts of the infrastructure, shown in Figure 29. The RESTful API contains several endpoints that handle user interactions through the Digital Agents, including iterations and stages initiation, adding users to the SC, uploading documents, and receiving topic identification. All of the iterations and stages of logging and contextual data (logs of interaction, time, users and events, links to channels, groups, and files) are stored in the associated NoSQL database.

Another component, that is simultaneously a layer of interaction in the system, is a group of external services used to streamline processes (transcription, translation, NLP) and connect with the necessary outside systems. One of those external connections that sit separately in this case study is the Microsoft Graph API [364]. It is the gateway to data and organisational structure in Microsoft 365 that provides a unified programmability model for accessing and working with the data of an organisation that uses Microsoft 365, Windows 10, and Microsoft

Enterprise Solutions in its operations, and allows Microsoft Graph to build applications and organise processes for organisations that use Microsoft Products and Microsoft Cloud. In other words, it allows *OurStrategy* to communicate, process, upload and download data from MS Teams, automatically create, alter teams and channels, add users, and organise schedules for activities. This layer of integration makes it possible to implement a system that adheres to the notion of un-platforming and allows the leveraging of the existing infrastructure and software stack used in the organisation. More generally, this and similar integration approaches support seamless data transition in the case of different transportation channels and mechanisms used. For instance, the Microsoft Graph API can trigger the creation of channels in MS Teams (not through the Digital Agent) for each stage of the iteration population of corresponding OneDrive directories with all necessary templates and documentation. Additionally, it leaves the option for PM to manually initiate the whole process and each stage without employee Digital Agents.

However, due to the organisational (enterprise) context of the study, it requires a certain level of access to organisational infrastructure and the necessity of granting the rights for modification and creation of different entities to the system, including but not limiting to the following:

- Permission to groups, users (search, invite, display, obtain description)
- Permission to read, review and modify on behalf of the logged-in user
- Permissions to read, modify the calendar of the users included in the department or team
- Permission to record calls conducted through MS Teams by users (to automatically obtain an interview recording and send for transcription)
- Permission to channels and teams (read, display members, create, delete, modify)
- Permission to files (associated with the user or limited to the specific team or channel)
- Mail permissions (to allow to read, create and send mail on behalf of the user, mostly for PM as the manager of the process)

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- Other permissions depending on the level of customisation.

Some permissions require administrative consent (accessing list of organisation members, acting without sign-in user) or approval from the system administrator managing the organisational infrastructure. This can be a limitation in some environments, as shown during the case study.

When it comes to the interaction with other external services, the system conducts it through the backend service and RESTful API. This is required during the system authentication with other services to send or receive information. As part of the research during the pilot phase of this study (an iteration conducted at a smaller scale in two countries), I employed several external transcription services to evaluate the quality of the automation transcription for an actual case study. They included Microsoft Cognitive Service [362], Amazon Transcribe [357], Google Speech-to-Text [359] and Otter [365]. All of them accept audio and video files as input with some metadata regarding the length, language and bitrate of the file and produce output in the form of the text in plain text or JSON format. The backend server that communicates with external services was written in JavaScript(NodeJS) and partially in Python for some periodical scripts due to the large library of available modules, packages and tooling to streamline software development [369]. During the backend and API design and development, one paramount aspect was the security of interaction to ensure any activity data and transcripts or metadata recorded could be accessed only by the system itself or a participant of the case study. All communications between different parts of the systems were encrypted, along with the storage that held the data. In the cases where the data was stored and processed by WorldFish infrastructure (MS Teams and OneDrive) or external services, an adjustment to ensure the data's integrity, confidentiality and accessibility to appropriate users was made. Specifically, MS Teams and OneDrive followed the internal Security Procedures of the organisation. At the same time, all of the external services employed complied and followed GDPR and related data protection legislation [370–373]. In the cases where direct interaction of the user with the system is assumed (dashboard and backend service through the web interface for configuration purposes), JSON Web Tokens (JWT) are used to handle authentication requests and interaction with the

RESTful API. Access tokens are generated for each user upon successful login into the dashboard interface through the web application, allowing the system to authenticate users during the request to each specific endpoint.

OurStrategy Digital Agents used a similar approach for implementation. The base uses JavaScript (NodeJS) to implement a dialogue logic and channel all interactions by employing Microsoft Botbuilder SDK to describe the logic and implement all the necessary event hooks and procedures to react to inputs from the user. In contrast, the state of interaction with each user (SC member in case of SC Digital Agent or employee in case of RS Digital Agent) is stored in Azure Cosmos DB. This allows the creation of a seamless process of interaction for participants. Overall, designing an agile and responsive user experience is crucial for a system that aims to achieve a streamlined effect and follow the un-platforming paradigm as user interactions are associated with designing, conducting, and analysing the media reach data, which constitute the stages of the complex process. In this regard, Microsoft Botbuilder SDK simplified the development of the Digital Agents dialogue logic. It implemented a secure, flexible and scalable solution that can be integrated with the existing information technology ecosystem of the organisation (not limited to Microsoft products). The benefits from the open-source SDK and tooling that allow for testing and connecting digital agents to interact seamlessly with users are still present where they (users) or Digital agents are, and provide the possibility of running the system anywhere with support of NodeJS and Containers (any cloud or bare-metal servers (in 2021)). The system's flexibility and transferability help reduce the development time and afford sharing components between Digital agents and the backend. In addition, a separate Azure Cosmos DB instance was designed to be used as the independent logging server to log events and errors associated with the system's work to provide the ability to detect and react to critical events in time.

7.4 Conclusion

Overall, my goal in Case Study 2 was to explore the facilitation of employee voice as part of a top-down organisational process, and investigate the possibility of

designing to enhance employee voice through the elicitation of stakeholder voice. The design activities described in this chapter helped to paint a picture of the organisational context of an international research organisation that works in a complex and distributed manner across several regions. This contributed to the identification of a number of design principles: *(i) end-to-end coverage* for EVP sustainability; *(ii) prioritisation of stakeholder voice* in strategy consultation through the aggregation of nuanced views; and, *(iii) flexible technology-agnostic approaches* to simple and affordable EVP. These design principles were operationalised through the development of OurStrategy, a digitally mediated process for a strategy consultation. I applied an AR approach through an in-depth case study (*instrumental case study*) [317] to obtain insight as to how digital employee voice systems (i.e. *OurVoice, OurStrategy* or any such platform) can be appropriated and used across an organisational workflow through a real-world deployment [312]. The WorldFish case study offered a unique opportunity to examine the challenges an organisation faces when integrating stakeholder and employee voice through participatory decision- and sense-making (OurStrategy). This stands in contrast to Case Study 1: Designing Bottom-up Employee Voice) in that Case Study 2 explores the end-to-end facilitation of the employer-led but employee-driven top-down process of strategy formulation.

Chapter 8 Case Study 2: Deployment, Findings and Reflection (Cycles 1, 2 and 3)

8.1 Introduction

This chapter describes the WorldFish case study, which took place over an 18-month period and involved over 60 participants. In the pilot phase, and with my support, WorldFish conducted a digitally-mediated strategy formulation activity (the initial cycle) across three countries; followed by a more substantial deployment across six countries (the second cycle). As part of Case Study 2**,** **Chapter 7** outlines the process implemented by the Steering Committee (SC) members from WorldFish and a dedicated Process Manager (PM). The pilot phase (the initial cycle) had the goal of validating the design decisions and testing the process developed in **Chapter 7**. The active involvement of the organisation's globally distributed employees and partners, in the data capture, sense-making and summarisation of qualitative data (interviews), were key components of the strategy consultation and formulation process. The second cycle served as the main phase of the study, and engaged six of the organisation's offices in Bangladesh, India, Solomom Islands, Myanmar, Nigeria and Zambia.

I start by describing the initial design, the existing context, and the environment of the study. The duration and structure of the study were reconfigured during the pilot stage due to the beginning of the COVID-19 pandemic and internal infrastructure limitations. The reconfigured *OurStrategy* process both accommodated these changes and addressed geographical distribution of participants. The Process Master (PM) established ownership for the process execution and governed it from WorldFish's Head Office in Malasia. In this respect, the pilot study and the main (full) study shared the same structure and methodology. The idea behind the pilot study was to test it in the 'wild' and refine it if needed (in accordance with an AR approach). In Figure 30 the cyclic arrows (inside the encapsulated Act step within the bigger Act part of the process) signify this process of iterative execution and refinement .
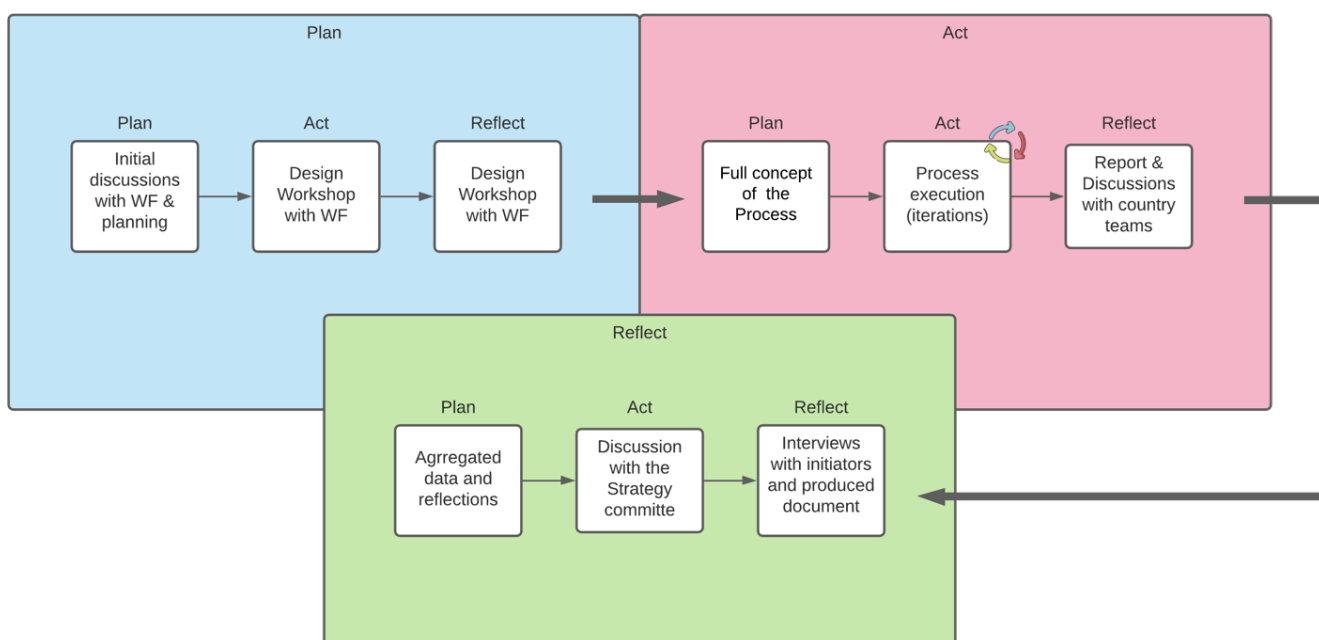
Figure 30. AR process of the WorldFish case study. Plan Stage, 3 months (end of 2019); Act Stage (Pilot and Full phases), 6 months (May-November 2020); Reflect, 3 months (January-March 2021)

I also document the findings from the two cycles of Case Study 2:

(i)   The in-field deployment of the *OurStrategy* process through the pilot study, resulting in reconfiguration and follow-up full deployment.

(ii)   The analysis phase, which covers both cycles of the study, to understand the implications of the *OurStrategy* approach for embedding stakeholder voice into the strategy consultations and formulation process.

(iii)   The findings and conclusions across the case study are discussed in relation to the research questions.

The design implications incorporate additional insights regarding the different aspects and associated challenges that arise during the facilitation of the stakeholders' voices, and embedment of the employee voice in distributed participatory processes. This extends previous research on approaches to scaling participation of community members in qualitative data collection and analysis processes [222] and integrates some existing formal and informal approaches to employee voice [1,110,185]. What was learned included the impact of transparency and participants' flexibility in sense-making on the quality of the data elicited and the subsequent analysis. Overall, this chapter documents a novel and effective

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process (*OurStrategy*) to leverage employee and stakeholder experience and knowledge.

8.2 Overview

Chapter 7 indicated that a Participatory Research method was used for Case Study 2 (as part of the 'Plan' step of the AR approach), during which we worked with WorldFish employees and the management team to come up with the process structure for the strategy consultation process, summarised in Figure 30. An iterative and practice-led exploration, analysis and evaluation process was adopted, with WorldFish's in-country researchers and stakeholders as the main driving force for decision and sense-making. The knowledge and experience of country teams shaped the interviews and identification of main messages and themes. Multiple country offices across the main three regions (Africa, Asia and the Pacific) were included, covering a potentially wide range of challenges and opportunities in aquaculture (aquatic foods in broader food systems). The goal was to organise the process as a distributed participatory activity acknowledging stakeholders' voices.

Apart from the dedicated PM, a team for each of the studies was comprised of WorldFish management, staff members and the author (from Monash University), assembled as the SC to design the activities for the iterations, based on the feedback from country teams (as outlined in the section on management consultation and Science Week in **Chapter 7**. In the Conduct stage, semi-structured interviews were used as the main activity to probe stakeholders at a deeper level while following the direction of the processes defined at the design stage of each iteration. The interviews allowed for a greater understanding of how stakeholders felt about both the challenges presented and opportunities for improvement. These interviews and further identification (tagging) of the key messages were led by country teams, with the SC team governing the transcription, tagging and analyses.

The organisation, management, conduct and analysis of the interviews were simplified. *OurStrategy* and the developed digital tooling were employed to make the process more efficient and effective through the usage of WorldFish existing

infrastructure and ESN (MS Teams). The goal was to leverage the employee's expertise, opinions, and knowledge without introducing new interaction interfaces or systems in the distributed organisation. This decision is supported by Case Study 1, discussed in this thesis, and is backed by the literature on similar research studies across different sectors [1,2,104]. I argue that maintaining a supportive and open organisational environment helps sustain accumulated wisdom within the organisation, enhance decision-making and positively affect organisational efficiency.

Based on previous studies, the decision was made to use a mixed approach to the strategy consultation process to leverage the advantages of both formal and informal approaches. The formal consultation mechanisms reflect the organisational structure's specific challenges and concerns [90]. The informal voicing mechanisms reflect the role of employees in the process and how data is collected and 'validated' through their perceptions and views, rendering itself beneficial for matters that employees perceive as more crucial for the organisation or that directly affect them [110]. By being formal, the consultation has been processed by employees and through the perception lens and experience of the environment in different country offices producing intertwined outputs that encapsulate a broader set of voices. As mentioned in **Chapter 7**, I see this potential subjectivity (of the employees' viewpoints) as helping to identify more nuanced and less visible concerns that can be overlooked at a higher level [342]. An additional goal of this study from an organisational perspective is to empower the teams based in different countries to communicate their views and research priorities from the particular circumstances in which they operate through this participatory, employee-led process. Overall, the two cycles of this study resulted in 65 interviews (with the participant details summarised in Table 9), being conducted across six countries, shown in Figure 31.

Figure 31. Countries participated in the WorldFish study.

The study was conducted in Bangladesh (12 interviews), India (12), Myanmar (12), Nigeria (11), Solomon Islands (8) and Zambia (10). The initial minimum requirement for each country to be included in this study was 12 interviews. Although not all countries met this minimum requirement (due to the COVID-19 pandemic and localized reasons discussed in more detail later in this chapter), the key stakeholders important to each specific country's work are included. They provide rich perspectives for future planning of the strategy and strengthening of inter-organisational partnerships.

Table 9. Participated stakeholders, grouped by domain.

Stakeholder group	Number
Academia & Research	**7**
Government	**19**
International institutions	**11**
Donors	**6**
NGOs	**7**
Private Sector	**7**
Fisher Groups	**8**
Overall	**65**

All seven groups of stakeholders were represented, as summarised in Table 9. The groups included representatives from fisher associations/groups, the private sector and government departments.

8.3 Pilot Study (cycle 2)

The initial seven-month period of this research study is as described in the pilot phase. As mentioned earlier, the primary goal of the piloting is to validate the design decisions and test the developed process. As such, the decision was made to run the pilot with the preliminary training session as the first cycle of the AR process within the global Act process of the WF study, as outlined in Figure 30. Although employees were familiar with the digital tooling and systems available inside the organisation (MS Teams and Microsoft Office), we decided to run a training session to reach a two-fold goal:

- to train employees who are not familiar with the process or with doing qualitative research, and,
- to conduct initial training, collect feedback from the participants and record the video instruction for distribution during the full study.

Concerning the first goal, the organisation's focus on aquaculture and its role in food systems meant that most employees were not familiar with qualitative research. Thereby, SC members decided to conduct an online training session and distribute the handout materials regarding conducting interviews and qualitative analysis. However, it should be emphasised that the focus of the *OurStrategy* process is to ingrain employee voice in the stakeholder (partners) voice. For this reason, we encouraged employees (future taggers) to freely include their subjective views on topics that emerged during the interview. These issues will be further discussed later in this chapter. For now, subsection 8.3.1 begins by describing the context and environment of the study affected by the global pandemic. Some internal infrastructure limitations became apparent and resulted in the reconfiguration of the study to accommodate the necessary changes to reach the anticipated scope and geographical distribution of the process.

8.3.1 Preparation and the Organisational/Context Limitations

As the preliminary step before the deployment, SC started preparing for the OurStrategy process and system 'integration' into WorldFish infrastructure in February 2020. Meanwhile, the initial SC committee for the pilot iteration was summoned, consisting of five members: *(i)* two managers, one research lead and one dedicated PM (from WorldFish) and *(ii)* the author (from Monash University) for the technical and process consultation as needed.

During the preliminary stage (not initially planned but rendered useful in the distributed and hierarchical international organisation), the SC committee started scoping the pilot study and identifying the first three countries to be included. Initially, the decision was to include four countries: Nigeria, Myanmar, Egypt, and Bangladesh; however, due to the COVID-19[7] pandemic and related issues in different countries, the pilot was limited to Nigeria, Myanmar and Bangladesh. Due to differences in time zones, two training sessions were scheduled. In both sessions, we (SC) briefly went through the overview and description of the process (Process overview), focusing on employees' input and influence, the digital tools and the software they will need to use. This training session was affected by changes that we had to make in the integration process as a response to the limitations and requirements of the existing organisational context and infrastructure.

Initially, an integration-wise plan was to introduce the digital agents in the MS Teams environment using the MS Teams Application [374]. Generally, applications bring an additional extensivity to MS Teams' functionality and allow the distribution of additional information between its users more efficiently, utilising common tools and external trusted components not usually available in

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[7] Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in December 2019 and the disease subsequently spread worldwide, leading to a global pandemic being declared in March 2020, and in turn triggering a sequence of global lockdowns. As of September 2021, the COVID-19 pandemic is still ongoing.

MS Teams by default (as in this study). For this study, the external trusted process (and associated digital system- *OurStrategy*) allowed us to broaden the capability of the WorldFish infrastructure and introduce a process for conducting qualitative research through the Digital agents such as chatbots, as shown in Figure 28. However, the (unanticipated) issue that this integration runs into is the complexity of the technical-structural organisation of this international NGO. Since WorldFish is part of the bigger international CGIAR network of innovation centres, the infrastructure and associated permissions, access and accessibility are all managed centrally under the joint account. Thus, introducing the new MS Teams in WorldFish requires approval from 14 other CGIAR centres to grant all necessary permission (7.3.4) for the system (and corresponding Digital Agents) to act according to the initial design. The permission granted for the design and conduct stages allowed SC Digital agents to create teams and corresponding channels, access files and folders, search and invite members of the organisation and schedule calls or RS Digital agents to access meeting recording. Furthermore, the most important apps are to be listed within the organisation app catalogue so that employees can add them to their stack of apps in MS Teams, as shown in Figure 32.
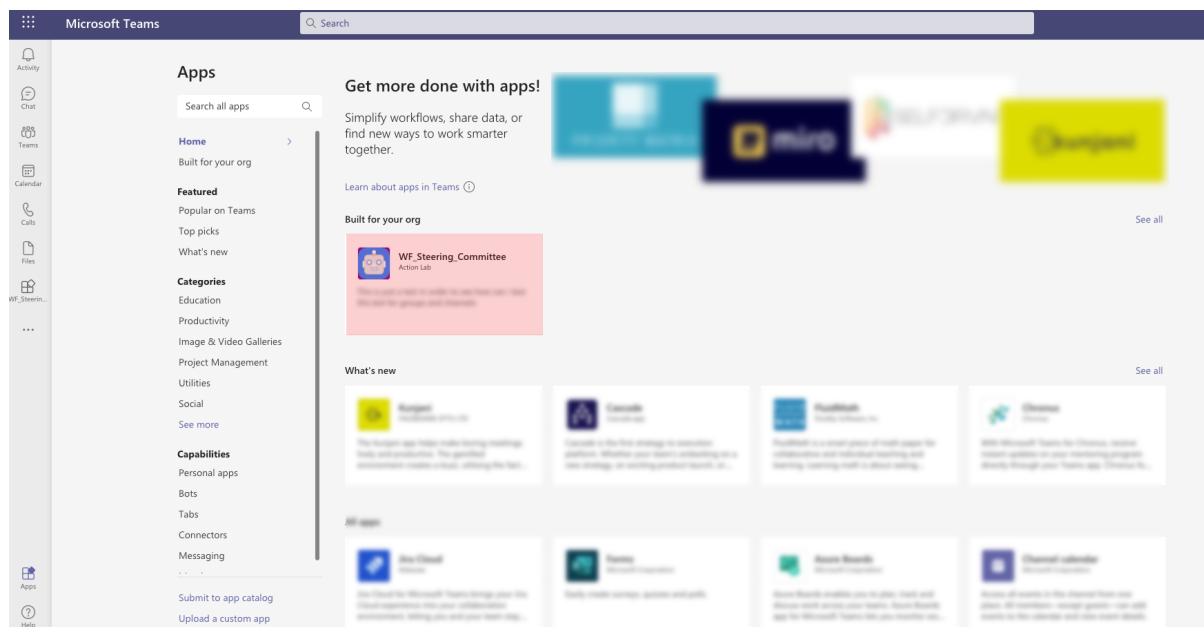
Figure 32. SC Digital Agent in the MS Teams Apps catalogue.

The consequence of this situation was a limited potential for the automation of the Digital Agent's capabilities as the main interface of the study and a primary

means of communication within the strategy formulation process. Indeed, it could led to a situation where Digital Agents would have only a limited ability to communicate with the SC members and employees. Moreover, that arrangement would have required the SC (or PM) and employees to divide the workflow between the two communication channels. For instance, this would involve scheduling, conducting and then uploading the recordings of the interviews manually to the specific channel of the certain stage Team (within MS Teams) and then complete the tagging through interaction with the Digital Agent. In the case of the SC members and PM, the team and channel creation must be conducted manually, and the list of participating employees and corresponding stakeholders must be organised. The perceived time limitation and related issues with automation that would have directly affected the experience of the involved parties led the SC to decide to leverage the OurStrategy flexibility and reconfigure the process.

After a discussion by the SC committee, the study was conducted without the Digital Agents being introduced. By design considered at the *Plan* step of the study, the *OurStrategy* process allowed for the substitution of certain components of the underlying system with other digital tools or with manual labour (which occurred in this case). The frontend component that consists of two Digital Agents (Group Agent for SC and Personal Agent for employees) were replaced by direct PM work or interaction with the SC members and participating employees. For instance, now the PM was responsible for creating specific channels for each employee (conductor) and each process stage (e.g., *Conduct*, *Tag*).

This change created additional overhead for the PM due to the extra administrative work of creating channels, adding members, scheduling meetings and tracking the data collection. It also allowed the author to explore the process in more detail, including the un-platforming and appropriating aspects that led to an SC driven re-design of some of the *OurStrategy* components. This re-design helps to make the work of the employees even more effortless and seamless. Subsection 8.3.2 describes the resulting design of the pilot study that was transferred to the full study with some additional tweaks and improvements based on collected feedback.

8.3.2 Study Structure and Changes

These contextual factors led to the pilot study being reconfigured, with some substantial changes in the realisation of the process. The initial design of the *OurStrategy* process assumed a degree of flexibility in the implementation and operationalisation of certain stages of strategy consultation that already provide the ability to modify components independently without compromising the intended result. This subsection covers the changes for each stage of the process, starting from the *Design* stage, introducing adjustments in the interview schedule for *Analysis* and utilising the un-platforming concepts to a greater degree.

8.3.2.1 *The Road to more Open and Flexible Strategy Formulation*

Design stage. Structure and procedure-wise, the *Design* stage stayed intact with the original plan being at the step outlined in 7.3, which involved interview planning, identifying questions and formulating the problem. The preliminary selection of stakeholders and the initial scoping for better understanding of the resource requirements and involvement of people were also important, as were other practical tasks such as creating the necessary documents based on templates. These included preparing the interview schedule, plan, protocols for ethics, interview debrief and training materials, consent forms, explanatory statement, interview tagging and interview summary templates. At this stage, interview questions were designed with the feedback from country teams, with six topic areas for capturing perspectives on future research priorities on aquatic foods, contributing to the overall interview length of up to 30 minutes (Appendix C.). The interview schedule transformed from a formal and scripted endeavour to a more open and dialogue-like meeting as part of a more flexible approach for capturing voices. In the beginning, interviews were formalised and strict, representing the usual survey-like 'direct' approach. To give an example, one question initially said:

> *In your view, what impact areas of fish and aquatic foods/livelihoods research should WorldFish focus on to 2030 in order to address these challenges?*

The initial interview schedule included 16 questions, such as Research Experiences (for stakeholders), Future Research Vision, Research Impact Areas, Partnerships and Management and General, representing structured and specific questions and probes, sometimes extending complicated topics. For example, one question asks, 'What current and future partnerships are needed to generate positive impact in these areas across scale?' (Appendix B.) However, due to the design of *OurStrategy* as an open and flexible process that aimed to grasp nuanced and potentially overlooked themes, SC (after consultation with the author's research team) modified the questions to adhere to the notion of the process. By way of a less formal reformulation, the question became:

> *What do you think will be the biggest challenges facing your area of work in relation to aquatic foods over the next five to ten years?*

The final version of interviews was stripped down to six questions, of approximately five minutes each (eventually, some interviews went beyond that time frame). These changes particularly helped adapt to the emerging contextual and infrastructure limitations discussed earlier in the chapter. Thus, they released the *Conduct* stage for more open discussion and simplified the task for taggers in the *Tag* stage. Eventually, the interview schedule consisted of the following topic areas:

- *Area(s) of work of a stakeholder.* This involved probing the interviewees on the type, scale, and scope of their work to understand their background and experience (as relevant to the project).
- *The relation to aquatic foods.* This was aimed at understanding the relationship with WorldFish's main focus on sustainable aquatic food production. It also involved identifying the types of systems stakeholders are involved in (e.g., capture fisheries, aquaculture or mixed), type of environment they are working in (e.g., marine, brackish or inland freshwater).
- *Thoughts on the biggest challenges facing their work area (and concerning aquatic foods) in the near future.* This was aimed at capturing their understanding of issues that are going to (or already)

manifest themselves in their line of work, based on their expertise, starting from their specific domains to broader ones and probing them regarding the potential solution (in their country and/or region).

- *Thoughts on challenges that nobody is presently focusing on.* This was aimed at capturing their thoughts on overlooked issues and things that should be focused on more, based on their experience.
- *Future research focus.* The goal was to understand their perspective on things that should be focused on the regional and global scale) for them and WorldFish (research-wise).
- *WorldFish collaboration with their organisation.* This was aimed at gathering their views on how WorldFish can improve the collaborative work with them/their organisation and others in tackling challenges.

The interviews became a more open dialogue between two parties, rather than one-directional interviews, encouraging some of the employees' views to be brought up. This allowed for 'interviewers' voices' to be heard as part of the conversation during the interview. Based on these changes and previously identified limitations, such as the outcome of the meetings with the teams, the decision to leverage the existing infrastructure and use already familiar tools (such as Word and Excel), it was agreed that, instead of communicating with Digital Agents at the *Conduct* stage, participants would use produced templates to record, tag and analyse interviews in Word. The PM had to manually create the MS Teams team for the iteration and invite all necessary participants to it.

At this stage in the process, the SC members worked together with the Country Directors to identify stakeholders and conduct the stage scheduler, scoping the associated teams that could engage in the process. This consultation covered the selection of the countries where WorldFish presented, based on feasibility, time, and resource availability to ensure that the three regions of WorldFish (Africa, Asia, and the Pacific) were engaged. A Country Directors' meeting was organised to help the team better understand the availability and potential engagement level and confirm the country selection. Stakeholders chosen for the pilot (and later for the full study) covered the following groups of external parties:

- fisher associations/groups

- private sector

- donors

- international institutions

- academia and research partners

- NGOs

- government officials and representatives

The focus was on stakeholders across WorldFish's pivotal areas such as nutrition, climate and socio-economics (according to the previous and current strategies and organisation focus). Stakeholders interviewed were selected by the Country offices (director and team) based on the stakeholder list guide (Appendix D.), representation and the availability of stakeholders at the time. Consequently, the availability aspect in the pilot and follow-up full study played a key role in selecting stakeholders and subsequent interviewing due to existing contextual factors and limitations.

For the pilot, the SC advised each country to conduct a minimum of five interviews across stakeholder groups (with intention of reaching the minimum of 12 for the full study), despite the initial plan to conduct 12 and 20 interviews, respectively. The intention was to capture priorities and views from those stakeholders who are not traditionally engaged with. The focus on the process from design to analysis stage was not only to benefit WorldFish's global strategy: benefit to the country teams and their priorities, achieved through potential adjustments that could be made to the planning and number of interviews with relevant stakeholders as needed, is also shaped by feasibility and everyone's availability. Therefore, the SC decided to limit the activities during the *Conduct* stage to interviews exploring the existing challenges and overlooked issues and potential solutions for them from stakeholders' perspective through the employee's perspective to inform a broader discussion within WorldFish.

Once the questions and all supporting documents for the interviews were finalised for the *Design* stage, they were distributed across the corresponding MS Teams channels for each country team to use. As part of the pilot study, additional

training was conducted (upon request) in using the digital tools for the *OurStrategy* process. The training comprised of three training sessions of one hour each with country teams of Bangladesh, Myanmar and Nigeria, covering the process of scheduling, conducting/recording (through building MS Teams tools), sharing interview summaries, obtaining consents and other documents that were required from the participants. These sessions also included an overview of the whole process, covering details on automatic transcripts, analyses, performing tagging, and identifying the main points.

Conduct stage. Each country team was assigned to the dedicated MS Teams channel, allowing them to communicate directly with the PM and access the training materials and templates. They could also upload the interview recordings, approved consent forms, produced interview summaries and feedback of tagged transcripts. Communication between the PM and participating country teams was arranged weekly through the same channel. Similar to the initial plan, the interviews were conducted by participating country team members after obtaining stakeholders' consent. The interviews were held through MS Teams (default option) or over the phone (if the internet connection was not stable). Post-interview activity included completing a preliminary summary for each interview and feedback from interviewers to refine the process during the full study. Unlike the initial plan, the communication with the SC team was directly through the PM and not through the Digital Agents. Recordings were then submitted through the system's backend to automatic transcription services, as in Figure 29.

For the pilot study, we used three transcription services to assess the quality of the provided transcription (Microsoft Cognitive Service, Google Speech-to-text and Otter.io). As the OurStrategy consultation process was held during the COVID-19 pandemic, challenges were manifesting across many countries during the Conduct stage concerning the time available to spend on the task, staff resources, stakeholder availability and completion of interviews across stakeholders. At that point, the SC members were mostly tracking cross-country progress and responding to challenges as they arose. During this stage, SC members were asked to complete an interview summary (the main points were outlined) in a Word document for further automatic analysis. This step was

introduced into the process as an additional safety mechanism for cases where potential audio files became corrupted (in the end, this did not happen during either the pilot or the full study) and as a mechanism of preliminary assessment of the interviews.

Overall, during the Conduct stage of the pilot, 15 interviews were conducted across Bangladesh, Myanmar, and Nigeria (five in each country). The emphasis of the interview process was conveyed through the initial training sessions. Country teams were to interview in the form of dialogue rather than in more formalised communication. A semi-structured interview was successfully followed, based on the emerging design decision to embed employee voice through the conducted activities. From the point of view of the OurStrategy process, the employees' opinions and thoughts that are voiced during the interview are of the same importance as those of the stakeholders they were interviewing.

8.3.2.2 *Tags Flexibility and Openness*

Tag stage. This stage was one of the most modified stages due to the limitations of the COVID-19 pandemic and infrastructural issues. To compensate for these factors, we used the approach of flexible provision, and we implemented agnostic components. The SC and the research team utilised existing software and infrastructure capabilities as outlined in Figure 33. Therefore, unlike the previous plan of using conversational digital agents for ideas identification, we decided to use an un-platforming approach, asking employees to use Word's existing reviewing capability to identify up to eight different main topics. The reviews were presented in the form of comments with the following structure: *(i)* main theme or idea of the reviewed part of the transcript, *(ii)* explanation of why they think it is important to identify, and *(iii)* taggers thoughts on the possible way to address this or to support it, if the main theme is identified as something positive (e.g., '*This is a novel approach in the country and only Cambodia has done this. It will make use of local ingredients instead of relying on imported products which are expensive*'). Based on the conversation, the main themes were identified by employees as a new, surprising, important or distinctive to a stakeholder. For example:

***Main idea:** Enhancement of rice field fishery and rice-fish farming has potential in Nigeria and could be an area of interest to BMGF investment.*

***Why:** Nigeria has over 3.0 million ha of floodplain areas where rice farming is occurring. In floodplain areas, rice farming is always associated with rice field fishery and offers an opportunity for rice-fish farming aquaculture. Targeting aquaculture for nutrition, through improved access to some essential nutrients through small-indigenous-species (SIS) has been shown to be successful in several countries.*

***Solution:** Enhancement of rice field fishery has the potential to increase access to SIS. The experience gained through research and development work of WorldFish in several countries could be extended to Nigeria to develop 'nutrition sensitive aquaculture'.*

Additionally, the transcriptions were verified by the members of the SC team. This verification process helped identify the interviews with lower quality tags since some participants were unfamiliar with the qualitative analysis and tagging specifically. These cases were analysed and sent back for re-tagging by the same taggers (three interviews during the pilot stage) to improve clarity and specification of the reasons behind the tag. Under such circumstances, the PM held a 15-minute Teams meeting with taggers to review the identified issues and quickly mitigate them. Overall, the quality of produced tags was sufficient for the process and adhered to the idea of identification of the main themes only, to support the agility and relative speed in the existing context, allowing collection and examination of the ideas and concerns through the lens and expertise of the WorldFish employees. Thus, the suggested structure for tags ('What?', 'Why?'. 'How to address?') facilitated the collection of the immediate employees' reflections on the aggregated stakeholders' feedback.

8.3.2.3 *Un-platforming and Simplification*

Analyse stage. This stage was designed to be the most flexible. This stage did not rely heavily on technology but rather on SC members to analyse and discuss the emerging topics. It was not as critically impacted by contextual limitations as the two previous stages were. The most significant change that provoked some tweaking in the way in which analysis was conducted was that taggers produced their tags in the form of Microsoft Word review comments. During the first step of

this stage, all submitted documents were parsed through the developed add-on of the backend system that produced an Excel spreadsheet with all of the interviews and corresponding tags lined up in a table, presented in Figure 33. The result of utilising the built-in Microsoft Excel functionality (in line with the un-platforming paradigm) was that it allowed for the automated data cleaning and merged through the Microsoft Power Query [241]. This Query produced a combined table with all the identified themes, perceived reasons and solutions from the employee perspective and original stakeholders' view (see Appendix E. for an example).

The SC members, with the author's support (for data cleaning and topic grouping), then conducted a higher-level context analysis and aggregation of the tags across all interviews. Eventually, all of the collected topics and themes were identified during the full cycle through inductive analyses by the dedicated SC members and the PM. Consequently, the themes identified were grouped based on different dimensions of their topic, stakeholder group, country, issue type, etc., and cross-checked between the core SC members and against collected interview summaries, which were available to enhance the credibility of the findings.

Ultimately, under the emerging limitations that entailed changes in the *OurStrategy* process, this approach has shown its effectiveness (in terms of effort, time and resource) while still producing a result of sufficient quality (based on preliminary analysis of pilot data by the SC). Thereby, this approach was extrapolated and used to conduct the full study.

8.4 Full study (cycle 3)

This subsection of the thesis covers the full run of the study conducted after the pilot study from October 2020 to February 2021, with most of the interviews (*Conduct* stage activities) conducted from October to December 2020. The full study used the same approach implemented during the pilot study (with reconfiguration due to the global pandemic and existing internal infrastructure limitations) the was explored previously in this chapter. Consequently, the findings go over the organisation and conduct of the full study across three regions and six countries. This section describes the process findings, which will act as the base for the later discussion (8.6) that cover all arrangements and organisational

aspects for the design, conduct, tag, and analysis stages for both cycles (pilot and full study). The discussion explores the implication of *OurStrategy*'s approach for embedding stakeholder voice into the strategy consultation process.

8.4.1 Results

This section describes the results from the full study based on the observation of the strategy consultation process, analysis of interviews conducted and employees' sense-making, aiming to understand the emerging themes and country-specific perspectives of WorldFish research strategy. Thus, findings built upon the initial analysis of the interviews done by employees and the steering committee's reflection on this.

8.4.1.1 *Activities Results and Statistics*

The full study resulted in 466 main points (tags) identified as crucial from the employee perspectives across the 65 stakeholder interviews. Interviews were conducted across the Asia, Pacific and Africa regions in Nigeria, Zambia, Bangladesh, India, Myanmar, and the Solomon Islands. The interviews were mostly conducted in English, with nine exceptions conducted in Bangla, Burmese and Pidgin languages. The interviews conducted in Bangla were verified externally after transcription. Neither the SC members nor the broader process team could verify the language (apart from the employees who conducted the interviews). To ensure accuracy, a manual transcription and translation service was employed for the interviews in Burmese and Pidgin. (The automatic transcription and translation service was either not available or available with a unsatisfactory quality of produced results at the time of the study.)

Table 10. Stakeholder Interviews during the Conduct Stage (Total and average length are in hh:mm).

(hh:mm)	English	Pidgin	Bangla	Burmese
# Interviews	56	3	4	2
Total Length	10:37	01:27	02:19	01:00
Mean Length	00:37	00:29	00:35	00:30
Max Length	01:53	00:31	00:50	00:33
Min Length	00:17	00:26	00:23	00:27

| Std Dev Length | 0.0110 | 0.0015 | 0.0069 | 0.0023 |

An average of seven main topics was identified from each interview. The 466 main points identified by taggers went through the collaborative analysis phase, resulting in 1219 topics, later aggregated into 15 theme groups. These topics and themes represented the key perspectives of stakeholders on the future priorities for aquatic foods research and WorldFish strategy to 2030, as well as the challenges and solutions that needed to be addressed in the stakeholders' views. Based on the identified themes and grouped topics, the SC members conducted a cross-country analysis to identify common themes (at regional or cross-country levels) and those more country-specific (for country-level strategies). A report was produced out of this analysis, providing a summary of stakeholder perspectives on future research priorities for WorldFish across contexts, regions, and countries, as well as reflections on country-level planning. Feedback on the report was obtained from country teams (both general and specific to their country) to validate the reports and to hear reflections from them. As part of this process, country teams were able to share the report with stakeholders that participated in the survey to adhere to transparency and the concept of bounded accountability adopted from the previous study. In the full study, 65 interviews were conducted, including stakeholders from the different stakeholder groups outlined in Table 9 from six different countries and summarised in Table 11.

Table 11. Stakeholder interviews distribution across countries.

Stakeholder group	Bangladesh	India	Myanmar	Nigeria	Solomon Islands	Zambia
Academia and Research	2	2	1	0	1	1
Government[8]	3	2	4	4	2	3
International Institutions	2	0	3	3	3	0
Donors	1	3	1	1	0	0
NGOs	1	1	1	1	2	2
Private Sector	2	2	1	1	0	1
Fisher Groups	1	2	1	1	0	3
Overall	**12**	**12**	**12**	**11**	**8**	**10**

8.4.1.2 *Employees Input and Participation*

This strategy formulation study has, as a core focus, the quality of the sense-making provided by the 'insightfulness' of employees' inputs during their interview tagging. Indeed, starting with the pilot cycle and continuing in the full cycle, the process has shown its capacity to facilitate the exploration of contexts from the different angles of diverse stakeholders, to help identify overlooked issues and take into account the knowledge and expertise of the researchers. For most key points and themes tagged by researchers within interviews, additional information justifies the importance. The personal experiences and expertise of the researchers can be combined with the information provided by respondents. The distribution of responsibilities makes it possible to build on responses with the expertise and experience of researchers. It also allows for quick identification of nuanced interrelationships between issues and the common challenges different stakeholders face within the country and at the cross-country level.

For example, the issue of property and labour rights in the sea and inland aquatic food sector was raised by stakeholders from several groups (academia,

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[8] Government stakeholders include those from across industries such as fisheries, economics, nutrition, agriculture, climate change, policy and planning divisions.

research, government, and fisher associations) in different countries (India, Nigeria and the Solomon Islands). The interviews provoked the issue being identified by employees (taggers) and offered insights to be expressed through their tags. In India, the issue was linked to the tags of 'promoting seaweed farming involving women' and 'inequality in the accessibility to the resources' between small and big fishers, while in Nigeria, it manifested through the provision of 'affordable' quality feed for aquaculture due to an inability to establish an operational hatchery. Moreover, these multi-faceted perspectives (through the different representation of consequences) show the value of the approach as a distributed validation tool. The recognition of the importance of issues through the different country offices is backed up by specific employees that simultaneously identify common concerns, demonstrating versatility, and in some cases, a potential solution for each of the cases. The tagging process makes it easier for the organisation to capture the common challenges different stakeholders face and provide opportunities for country teams to contribute.

Since most of the tags are detailed and explanatory, sometimes those tags consist of additional information not originally mentioned by the stakeholder. This is a strength of the process, allowing for additional values and providing better contextual understanding. In most instances, this extra information adds explanatory power to the process. However, there could also be a tendency to lose or shadow the original message communicated by the stakeholder. While the tagging process allows researchers to incorporate their perceptions and views regarding the important aspects of the interviews, one should be careful not to obscure the original points being made by the interviewee.

A more collaborative tagging system was suggested for the full study. The cross-validation of tags by other employees, SC members, post-tagging reflection activities, or focus group workshops ensures that more participants examine the same data. Aspects of the data are identified and validated, and opinions shared. In addition, the short keywords on themes created help identify and focus discussion on key aspects that need to be explored through the interviews (e.g., challenges, collaborations, research and development, food safety, etc.). The

justification for the selection of these keywords can be followed up to help expedite and streamline the process of analysis.

For this reason, the core team, with members of country teams, employed an additional mechanism of collaborative tagging of their work. This cross-validation of the tags was undertaken at the end of the *Tag* stage and the beginning of the last stage (*Analyse* stage) and ensured that more researchers looked at the same data to identify and validate the important aspects and share their opinions. The short keywords on themes created and justifications of their selection helped to focus, expedite, and streamline this work, ensuring the overall validity of the process.

8.4.1.3 *Process Organisation Implications.*

One of the study's aims was to examine the potential of such a distributed and employer-led but employee-driven approach to the strategy consultation process as a substitute to the usual strategy formulation done at the top level of the organisation, or as the alternative mechanism for validation and 'sanity checking' of a strategy already developed. This case study reveals that the process of *OurStrategy* can collect a substantial corpus of data in a relatively small amount of time and indicates OurStrategy's agility and ability to adapt to changes in the context. Indeed, despite the complexity linked to the start of the global pandemic and resulting delays of the pilot and full iterations, the most labour-intensive stages of *Conduct* and *Tag* were done within three months. Moreover, the stages were run in sequence (not in all countries simultaneously). They provide additional flexibility for sense-making and tweaks in the process, according to the AR paradigm. As the PM responsible for overseeing the process execution stated, "it's great that flexibility [of the process] allows us to adjust and reconfigure everything based on employees feedback and permission issues we are facing at the moment" [PM].

The SC decided to switch to a more lightweight backend for the *OurStrategy* process to overcome the infrastructure permission barrier, completely powered by MS Teams' already existing functionality. Although this switch involved more manual work from the PM, it provided an interesting representation of the

simplification and un-platforming approach [196] without losing the variability of the distributed sense and decision-making endeavours that helped to switch to the existing alternatives. The result was greater employment of the organisational Office toolkit, like Microsoft Office 365 products and MS Teams. It included extensive use of the Power Queries and Microsoft OpenXML for the simple data processing pipeline shown in Figure 33. As a result of the lightweight backend, different modules of OurStrategy discussed in the System Architecture section (7.3.4) were not used and replaced by manual work or simplified interaction. For instance, Digital Agents that were developed as the frontend interface to communicate with the employees and SC members were replaced by PM.
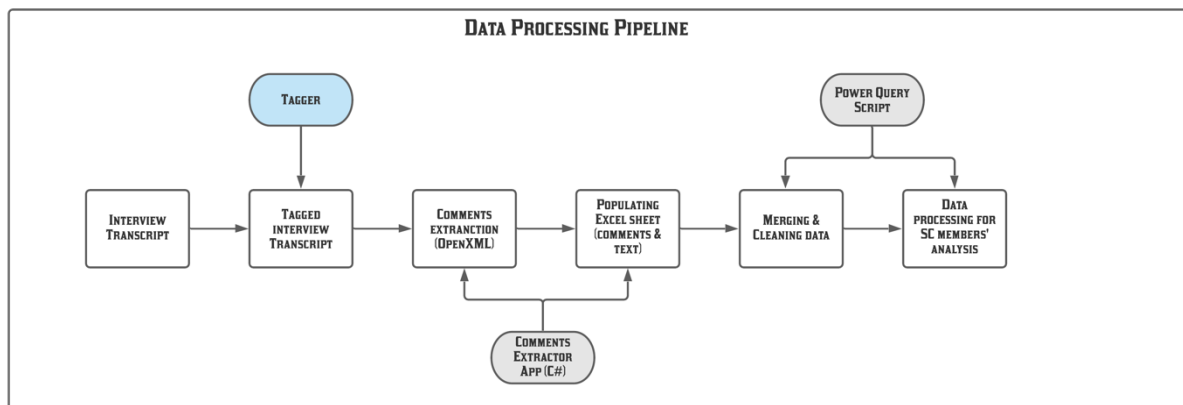
Figure 33. Interviews' data processing pipeline (Microsoft Office).

This led to greater simplification for the taggers, who could do all the work in the Word document without using additional software. The shift from the previously designed (for taggers) interaction with the interview transcripts through the bot to more familiar work with the documents (without introducing the usual complexity of qualitative analysis software) helped to flatten the learning curve for participants and additionally gave them more flexibility in choosing how and what to use as the main topics from the interviews. Another aspect of the pace of the *OurStrategy* process was that in 82% (or 56) interviews where the auto transcription software was used, the quality was sufficient for potentially rapid turnover between the stages (from *Conduct* to supplying taggers with the transcripts for the *Tag* stage). In some cases, we did receive lower results when the audio recording quality was worse than usual (connection freezes and noisy environment).

A further interesting observation is that the *OurStrategy* process unintentionally facilitated tighter communication between WorldFish researchers and the stakeholders, allowing employees to understand stakeholders' concerns and views better and draw a clearer picture of the WorldFish focus and processes for stakeholders.

> *Stakeholder (India, Fish Association): 'So, I think later on, once you finish this, when the purpose of this… when you have your [WorldFish] research focus established and made, I would definitely want to have, to know what are the focus areas so that we can work further and generally in India would be much better-benefited collaborating WorldFish'.*

Inevitably, the creation of an additional 'communication bridge' between stakeholders and employees increases transparency and openness, especially through the type of interviews that the *OurStrategy* process involved, which was closer to dialogue and discussion than formal interviews, a decision the SC committee made deliberately after the experience of the pilot cycle. For the full iteration, the SC committee indicated to interviewers that there was no need to follow strict interviewer-interviewee roles in the conversation. Consequently, this advice led to the interviews being run more as a dialogue that involved both sides providing their input. This potentially subjective way of collecting data benefits the process because of the higher degree of involvement of employee voice (in this case, of interviewers). Indeed, similar to the *Tag* stage, in which taggers are asked to provide potential solutions for identified themes, interviewers' involvement in the dialogue helps capture their views and experiences and the stakeholders' opinions.

8.4.1.4 *Emerging Themes*

The cross-country groups of identified meta-themes through the OurStrategy process lay within the broader areas including Partnership, Capacity Development for the local producers, Nutrition, and Production chain, as presented in Figure 34. It shows how the socio-economic and production management issues within the whole aquaculture value chain are deemed of higher significance across all involved countries, indicating areas for future improvement and application of WorldFish's research and development programs.

Thus, the overall key topics were concerned about increasing the visibility of WorldFish development innovations and models to the local and international communities to increase their uptake and resulting efficiency:

Stakeholder (Bangladesh, Donor): 'I don't actually think there's any problem with the research or the quality of the research, I think it's about the outreach. And so when I think of the other development partners that I regularly see at workshops and events on climate change, they don't often think of WorldFish. And so um, I think there's more to be done in terms of publicising not in academic papers, but more amongst the, the development community and to share your offer, I guess, what, what, what you can do what has been done? What are the results?'
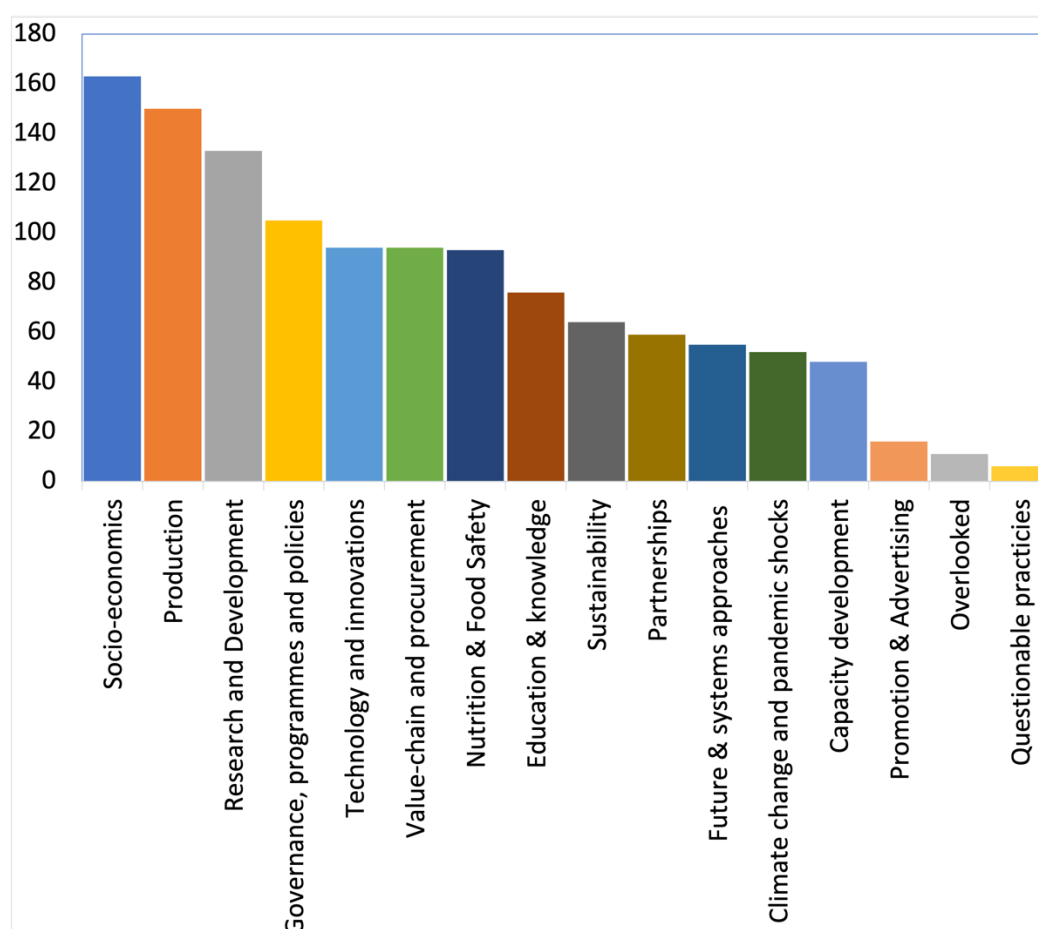
Figure 34. WorldFish OurStrategy process: Cross-country meta-themes.

Eventually, this indicates the necessity for WorldFish (and One CGIAR in general) to better communicate their research and invest in co-creating research and development with stakeholders and other partners. They also need to focus on becoming more unified in development and working across different One CGIAR centres. Through the identified tags, employees highlighted the increasing

importance of effective partnerships with communities, governments and international institutes, and input into the innovations aquatic cultures, such as fish-based products for nutrition and climate-smart initiatives across sectors (water, energy, food).

Tag (India): 'Main idea: Partnership-Collaboration between CGIAR, WorldFish and Government at Ministry and state level for the purpose of enhancing production and productivity of fisheries'.

Indeed, different stakeholders' groups raised the topic of knowledge distribution across countries and regions, such as different innovation models for production and technical support such as rice-fish systems and solar processing technologies, shown in Figure 35. Stakeholders were adamant about increasing the capacity of local stakeholders, including NGOs, academia and fisher associations. For more detailed information on stakeholders' perspectives across the countries, please refer to Appendix G.
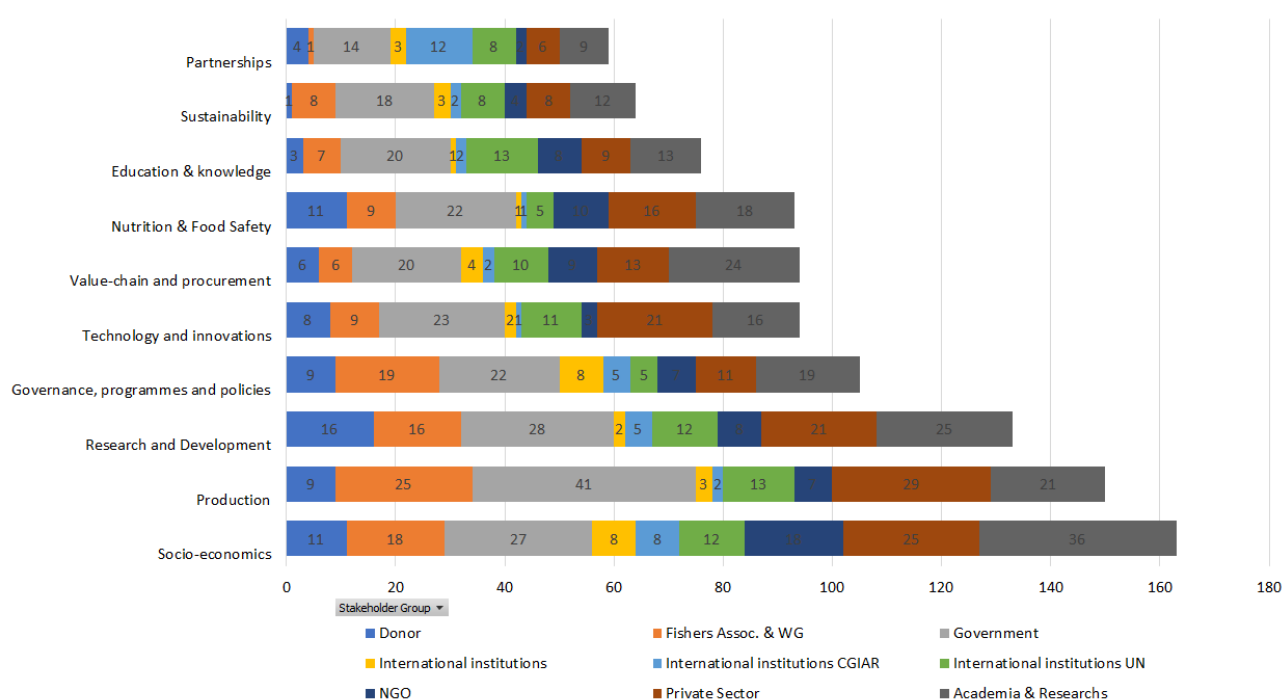
Figure 35. WorldFish OurStrategy Meta themes distribution between different stakeholder groups (top 10).

Stakeholder (Myanmar-Government): '...so it will be good if organisation like yours can provide the technical support to that area, the community from that area for raising fish, providing the techniques on how to make the fish ponds and how to raise the consumption of fish. Something like that. That's what I'm thinking. Although we say mountainous area, not all the hilly regions are the same in nature, as I already mentioned'.

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Consequently, the idea of collaborating and empowering local aquatic food actors was shared among interviews from different regions, including in the meta-themes of 'Socio-economics' and 'Education & knowledge' included in Figure 35. This involves focusing on involving women and youth and incorporating and valuing local knowledge and perspectives on challenges and solutions to the sector.

> *Stakeholder (Nigeria, Donor): 'on the other hand, aquaculture is an emerging field and is faster is more guaranteed, even if it's resource intensive at the beginning, but because it has one very spectacular feature around it, which is woman predominating in the value chain, we think it's a hugely attractive space to do investment in because aquaculture guarantees income. Aquaculture allows women not just to grow fish in their backyard, but actually partaking the smoking and trading in every aspects of the value chain. We've seen a great proportion of women partaking in it. So even for the attractiveness of it alone, we think investing in this space will be hugely important'.*

Additionally, WorldFish research regarding overall nutrition and healthier food habits and consumption demonstrates increasing relevance and applicability. One example is focusing on vulnerable areas with fish deficits and high malnutrition, including working with vulnerable groups such as women and youth.

> *Stakeholder (Solomon Islands, Government): 'One area that is outstanding: especially coastal communities, that depend on seafood but not on freshwater products. The understanding is lacking, the nutritional value they get from freshwater product is better than seafood. It may be cheaper or easily[sic] to operate, earn an income or a lot more opportunities. I am not sure if some communities have tried these options, what they can more with freshwater species. What needs to be done, to make this shift of awareness?'*

This issue came out tightly coupled with the notion of production diversification (e.g., integrated systems across food sectors) and aquatic food products (dried, powdered, fermented) through sustainable and resilient practices, such as enhancing the under-valued sectors of small-scale capture fisheries and aquatic plants (seaweed culture).

> *Tag (Nigeria): 'Main idea: No attempts/research have been made to diversify species in aquaculture production is a noticeable gap in research'.*

Stakeholders assumed that these issues would benefit from more systems research, from production to consumption, that would involve working with non-aquatic food partners. Innovations and solutions across different sectors (such as other One CGIAR centres) would generate multiple benefits.

Regarding overall themes and issues identified in the *Analysis* stage, many discussions were held around the challenges that different aquaculture areas have, including ways to face them and discover potential solutions. One such method is to consider stakeholders or employees (through tags or dialogues) ideas on how to deal with these issues by sharing existing solutions or learning from those who already discovered them, as shown in Figure 36. More detailed country-specific themes are presented in Appendix G.
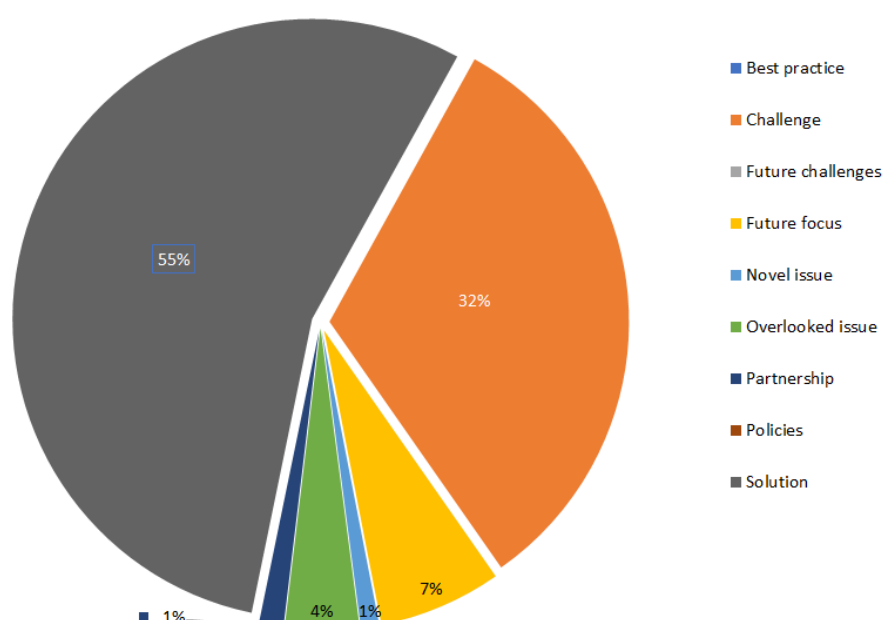
Figure 36. WorldFish OurStrategy: Type of issues identified through the analysis of interviews.

Tag (Bangladesh): 'Main Idea: Mass awareness building on use of antibiotics, aquatic drugs or chemicals for safe and quality fish food production appears as a potential solution.

Why: Though mass awareness building seems a conventional approach, however, to stop indiscriminate use of aquatic drugs and antibiotics considering human health, there is no alternative to halt it'.

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8.5 Findings

Through the 18-month collaboration with WorldFish, the socio-technical process *OurStrategy* was designed and implemented that included a three-cycle research process:

(i)   An initial design cycle to help formulate the participatory employee-driven approach for a strategy consultation process for a globally distributed organisational engagement across the three regions of WorldFish presence.

(ii)   A pilot cycle within three countries helped refine and actualise the *OurStrategy* process in response to the emerging contextual and global issues.

(iii)   A final full cycle with wider deployment, where employees (researchers and managers) contributed to each workflow stage through the developed and refined socio-technical process.

Thus, from the process organisation and usage of the developed system emerged insights into the design and configuration of *OurStrategy*. These findings provide further understanding regarding the digital facilitation of employee and stakeholder voice. Unlike Case Study 1 (*OurVoice*), *OurStrategy* gave insights into the intricacies and opportunities of using existing infrastructure and digital technology to support the structural and more formal practices of a decision-making process across the distributed offices.

In the subsections below, I evaluate the *OurStrategy* formulation process by comparing it to the official process, understanding the advantages and disadvantages based on the results. Under the *Official* strategy here and below I mean the formulated and adopted strategy that was prepared through the usual manager-led and manager-driven procedure. *OurStrategy* is a manager-led but employee-driven process of gathering insights from stakeholders through the lens of employees. This is done to compare these approaches and assess strong and weak points to evaluate the usefulness of the *OurStrategy* from the organisation's perspective.

8.5.1 Similarities between OurStrategy and Official Strategy.

In both approaches to the strategy formulation process, a theme of the greater potential for aquatic food was discussed extensively. In the Official WorldFish strategy, the historical importance of aquatic foods was recognised. The current undervaluation of aquatic foods resulted in promotion among the local and regional populations (from both production and consumption perspectives). The data collected through the *OurStrategy* process revealed similar assumptions towards aquatic foods. Aquatic foods, especially smaller species, are not considered an important source of protein and nutrients among consumers (this point was raised in India, Bangladesh, Myanmar and Nigeria). A number of fish producers across the Asian and African regions share the same attitude towards smaller species and diversification through other species and different aquatic products (such as seaweed and prawns). Both strategy approaches (formal and *OurStrategy*) raised the necessity of additional work towards achieving higher affordability and acceptance of aquatic food through technological innovations, infrastructure optimisation and educational initiatives.

Similarly, both approaches revealed the great socio-economic value of aquaculture and corresponding services for local communities and whole regions. The official process identifies the stimulating effect of more environmentally friendly aquatic food production compared to land-based agriculture goods (such as crops and meat), deeming aquatic food to have higher production sustainability, be able to sustain more affordable jobs in the local regions and support the livelihood of marginalised and vulnerable social groups (youth and women). In line with this perspective, *OurStrategy* highlighted the importance of aquatic food production to the local economy in all six countries (especially in the rural areas of inland water for Asia and Africa), identifying aquaculture as the default occupation for women and youth to start their professional experience. However, the *OurStrategy* process also raised additional real-life socio-economic issues and problems, such as education, 'market' literacy and the support of poorer households.

Another prominent aspect discussed in the official strategy is the nutritional value of fish as a source of protein and micronutrients for local communities and low-income households, sometimes without any alternative. Supporting this point, during the *OurStrategy* consultation process, stakeholders mentioned the crucial role of fish in the battle against malnutrition (Myanmar, Nigeria, Zambia and the Solomon Islands), again emphasising the challenge of promoting fish consumption and changing mindset towards less 'prestige' small fishes.

Overall, in both the official strategy and *OurStrategy*, certain challenging points about aquaculture were raised, including infrastructure development, production sustainability, competition for resources for aquatic food with other types of agriculture and the resulting resource shortage. Other issues include value-chain and work-related problems for people involved, including exploitation, low literacy, and marginalisation of certain groups. These problems affect the quality of produced products, the efficiency of production of fish and related sea products (including fish stocks and fish food), especially when supplemented by bad practices, overfishing and lack of knowledge sharing in regions.

8.5.2 OurStrategy and Official Strategy: Nuanced Angle

Unlike the official strategy process that, due to its overarching nature, covers the broader global focus and vision of the organisation in general terms, the *OurStrategy* process helps to distil these broad and common issues from the more specific and local challenges that different country offices identified during their process cycles. In the process, various concerns and challenges are brought up from across the countries concerning similar broader issues or concerns that are not always accounted for otherwise. For example, there is a lack of indication of how the official strategy will be applied in a specific situation. The official strategy has identified several areas (future research and partnership focuses) for WorldFish, including climate resilience and environmental sustainability, that were also recognised through the *OurStrategy* process in the countries (demonstrating their global significance).

However, our approach helped to produce more nuanced and country-specific ideas related to the broader strategy. For instance, the official strategy talks about

climate change through a set of enabling directions for action, including one that states the organisation will 'enable sustainable production of diverse aquatic foods', covering the general aim of recognition of the 'necessity of identification of innovative solutions to harvest and produce diverse aquatic foods sustainably'. In contrast, *OurStrategy* covers these enabling factors and goes into detail, with variation for the specific regions and countries, highlighting the importance of conservation of freshwater aquatic ecosystems and inland fisheries and the current negligence surrounding this aspect (Bangladesh: research and academic, fish association stakeholders). This raises the question of potential actions that can be taken to face and mitigate these issues.

Another example is the idea indicated in the Official strategy document: integration with land-based food production systems for more efficient production and collective tackling of issues. In contrast, in *OurStrategy*, this idea was formulated in a particular manner for WorldFish to embrace an integrated research strategy of the systems transformation approach: that is, to focus on integrated, demand-responsive research relevant for the region, country, and local market partners, and conduct research based on the region, country, and landscape-specific context. The idea is combined with better management of the full production value chain to enhance traceability, both in production systems and food safety systems (India and Myanmar). *OurStrategy* revealed the traceability aspect as important for controlling the quality of the product throughout its movements from the place of production to the site of consumption, which would decrease waste and loss pressure and ensure a better quality of the final products for consumers. This raises the question of what can support governments' interest in traceability, due to increased transparency of the aquatic food systems and revenue they are generating? Again, traceability positively affects the production and sustainability of aquaculture in the corresponding regions. These connections are not always explicitly recognised in the Official strategy, and the nuances are not reached in the same way as in *OurStrategy*. One of the stakeholders in Myanmar stated: "A lot of the drivers affecting the aquatic food sector are coming from elsewhere, and that's the starting point. These inputs and outputs need to be addressed". Overall, *OurStrategy* supplied more

personalised and country-specific cases that can either inform the strategy or act as a point of validation to assist in evaluating an organisation's existing strategic decisions and vision.

For example, in returning to more integrated research approach, the official strategy declared a priority research area: the aquatic food production 'integration into water and land systems at landscape and watershed levels' in ways that sustain and diversify food production within environmental limits. At the same time, data collected through the *OurStrategy* process agreed with the proposition. Stakeholders suggested research into the potential of seaweed as the step to achieve this goal due to its fast growth and ability to take advantage of salinisation, making it a clear example of a path to aquatic foods diversification and sustainability. In this example, not only does the validation case immediately address the general approach, it provides a more nuanced account of the challenge. This characteristic of immediate applicability supervenes from how *OurStrategy* sources the data upwards from employees and directs it to the organisation managers.

Aside from the environmental imperative to improve the sector's efficiency and sustainability, the official strategy emphasises the vitality of the loss and waste reduction in aquatic foods production to address related losses in nutrition, livelihoods and public health while transforming production to be more environmentally friendly. *OurStrategy* reveals the same focus on battling waste and losses through specific projects like establishing location-specific fish harbours that can be a solution for losses in value-chain and production. They can help maintain a good quality of products and add value to the fish product to achieve a good return on investment (Bangladesh: private). Stakeholders suggested that they can play an important role in value addition for capture and culture fisheries, while also providing the ability to grade and sort fish for different purposes such as packaging and drying (Bangladesh: fish association). *OurStrategy* can leverage local experiences to shed light on some of the local variations, enhancing the decision-making process within the organisation. This is especially the case if it is distributed across the locations with different contexts and helps to connect diverse needs and increase strategy robustness.

8.5.3 Official and OurStrategy: Different angles.

The employee-driven strategy process held by WorldFish reveals more nuanced and specialised aspects compared to the Official strategy. The process also indicates areas that were not fully reflected in the strategy, showing some of the issues and concerns that came up through the *OurStrategy* approach. Vice-versa, the Official strategy has some internal organisational themes that have not been mentioned through the process that we (research team and management) have conducted.

One of the areas is discussed differently in several countries through the *OurStrategy* process. The topic of capacity development and knowledge sharing includes financial support infrastructure for fisheries and the fishers' financial literacy. Although the general topic of capacity development and knowledge sharing is presented in the official approach, some of the concrete themes discussed in the *OurStrategy* are not reflected. These themes include supporting the private sector through micro-financial organisations (India) and insurance for aquaculture farmers (Nigeria, Bangladesh). The idea is that insurance for aquaculture farmers can be a solution (or at least a temporary mitigation mechanism) against the sudden loss and damage induced by extreme weather events like floods, cyclones or value-chain failures and problems. Yet, insurance is usually seen as a burden without clear advantages, and this supportive aspect is usually not well discussed with the local producers. Our data show that fish farmers and entrepreneurs of the aquaculture sector do not typically have insurance policies, meaning they will not have any protective measures even in the case of sudden loss (Bangladesh, Nigeria: private sector).

Uniquely to the *OurStrategy* process, the idea of improving financial literacy and establishing supportive mechanisms has shown some ways for the positive reinforcement of producers and workers that make production more sustainable and open. The result is the possibility of a better workplace environment and additional incentives for workers. One way to achieve this is through offering investment opportunities in fisheries and the motivation of fish workers to be more financially active, concerning the labour that they are doing. In addition to

increasing financial literacy, WorldFish can also induce better and more sustainable production practices through the support and promotion of fishers' and workers' investments in equipment, environmental infrastructure, and the companies at which they work. (Zambia: research and academia, India: fish association, Myanmar: private sector). This links to another issue: problems that are invisible to organisations (like WorldFish) due to their lack of first-hand knowledge about settled social norms, such as illegal fishing and the use of illegal fishing gear, and lack of understanding of the challenges communities face related to financial institutions. Stakeholders suggest that, through tackling this kind of issue (as multi-disciplinary projects), external organisations can understand the challenges communities face by obtaining their perspectives. This leads towards offering appropriate assistance to fisheries and workers and would contribute to more bottom-up development concepts.

Finally, the conduct phase of the process supported the WorldFish focus that can promote the production and consumption of locally captured fish by conducting research and showing the therapeutic potential of fish (Zambia and Myanmar). Thus, stakeholders from the Myanmar government, building on a similar Cambodian experience, suggested that WorldFish research the development of fish-based therapeutic foods in treating malnourished children (Myanmar: government).

Different areas of strategy were not specifically recognised within the official strategy. In other areas, the discussion in the official strategy is less detailed and missing some of the focus critical to specific regions and countries. However, there are organisation-specific topics raised in the official strategy that are missing from the *OurStrategy*, and themes that exist in the official strategy that did not seem topical or apparent for the national offices or local stakeholders during the *OurStrategy* process. One such organisation-specific topic is the WorldFish cultural environment and the organisation's development internally ('higher-performance, talent acquisition learning and growth culture'). Other strategic and more external topics such as digital transformation, advocacy and strategic outreach were raised during the *OurStrategy* process, indicating that internal and visionary aspects require more top-level decision making, including organisational

financial sustainability. Even though some of the suggestions regarding reaching out to donors and new research proposals were raised through the interviews with international institutions and donors' stakeholders, this vision was reflected more through the official strategy document. This internal focus of the strategy document included the topic of workplace culture and inclusivity, and in part, covered the employee voice and engagement area. Overall, part of the organisation-specific topics related directly to the internal structure and organisational culture. The *OurStrategy* process covered all impact and research areas that were discussed in the Official strategy document.

8.6 Discussion

8.6.1 Comprehensive Way of Decision-making and Strategy Consultation.

Decision-making processes in companies often operate at a scale of complexity that make it difficult to account for potential variations and nuances of the environment in which an organisation operates. The findings of Case Study 2 show the ability of *OurStrategy* to explore contexts from the different perspectives of diverse stakeholders. This process facilitates identifying some overlooked issues by leveraging employees' and stakeholders' experience and expertise.

The complexity of such endeavour is particularly substantial in strategic, higher-level decision-making, in which decisions must be sufficiently generalisable and still enhance the organisation's existing communication and engagement strategies. Indeed, this manifests as critical in the non-profit context due to the fact that such organisations' operate in a volatile environment where communication with stakeholders and partners from different sectors [163,207] must reflect, respective values. In a comparative study of strategic planning in non-profit and for-profit organisations, Hull and Lio emphasised the importance of the careful balance of risk and innovation in strategic planning of non-profits due to the higher-level social responsibility expected of them. The social capital consequences associated with potential failure are substantial, and linked to the quality of services and social value of the activities the organisation engages in [163].

The idea of focusing on stakeholder expectations is not new in OB. Bryson discussed the strategy formulation process and highlighted the importance of identifying stakeholders, and managing their expectations, in successful strategy development [43]. Similarly, Moore explored how non-profit organisations approach strategy and organisational missions, and the importance of sustaining social value in the eyes of stakeholders and leveraging their experiences while adhering to their expectations [247]. This notion of direct stakeholder engagement in planning was also emphasised by Eichhorn et al. in the examination of the Sustainable Development (SD) Agenda [108]. Authors have shown the advantages that engagement can bring to both the organisation(s) involved and the process; including identifying additional support from partners, optimising resources, and achieving tighter articulation and understanding of actors' positions and expectations. In the case of organisational strategy, this can mean a more nuanced and contextual adaptation to the organisation's environment. Dlouha's work in the same SD area [94] supported the idea that jointly developed strategic views guaranteed a common understanding across a wider cohort of stakeholders and facilitated better integration of the vision.

As with previous research, findings from this study showed that the stakeholders' experiences and knowledge could be beneficial to the decision-making process. Moreover, researchers tagged key points and interview themes that identified additional information pertaining to the shared stakeholders' experiences, thereby providing nuance and justifying its importance. Ultimately, the *OurStrategy* process supported a quick identification of common challenges faced by different stakeholders both within and across countries. The combination of the iterative execution of the strategy consultation process and its data-driven character provided the flexibility to respond to new insights (in the next iteration) and focus on emerging themes.

The study has shown how *OurStrategy*, a more participatory and employee-driven process, helped to shed light on common issues across different countries and to validate the existing organisational strategy in relation to concrete cases and contexts (Design Goal 1 - 7.1). This is particularly critical as it allows organisations to obtain different perspectives through the opinions of partners and

stakeholders that are not normally heard. In this case, these unconventional strategy formulation stakeholders included the private sector and fish associations. Indeed, the *OurStrategy* process identified the same set of topics that were in the official strategy document, suggesting its applicability and ability to deliver the equivalent insights to the conventional process. Moreover, due to its inclusiveness and participatory nature, the *OurStrategy* process distilled the issues through the stakeholders, interviewers, and taggers, providing specific and personalised accounts of general ideas that were grounded in concrete, region-specific examples.

The technology agnostic nature of OurStrategy allowed the SC to react to external factors (the COVID-19 pandemic) and internal barriers (infrastructure issues) and reconfigure he technical aspects of the process without changing the logic of the stages. Similarly, each of the subsequent iterations allowed the SC to focus on a different theme and adapt the activities in the *Conduct* stage. This comprehensive approach accommodates contextual factors and provides an option to configure to the process to maintain its rigour.

There are limitations to the *OurStrategy* process that should be considered. Although flexibility helps to address contextual factors, it can also limit the quality of the data if the configuration of the process is not appropriate, for example, due to short iteration cycles, questions that are too closed or narrow, or the limited availability of stakeholders. Indeed, at the beginning of the process, the SC planned to conduct activities formally, with 16 questions for each interview, omitting the crucial aspect of openness and 'informality' of conversations between employee and stakeholder that helped the interviews to become more like a dialogue and incorporate both sides' views. This also applies to employee tags and their openness and simplicity. The openness and simplicity of the process requires facilitators (PM) and managers to adhere to the informal and employer-driven paradigm of *OurStrategy*. Another potential limitation is the external focus of the process. Since dialogue with stakeholders is the intended goal, experiences and ideas internal to the organisation could be neglected unless they are raised in the interviews and discussed. This was apparent, to some degree, in the comparison with the official strategy, which had a clear internal workplace focus, unlike the

findings of OurStrategy. This issue could potentially be mitigated by conducting and internally focused iteration (i.e. employees interviewing other employees) at the beginning of the process, which is what happened during the Plan stage of the study. However, in this scenario, the usual organisational and personal inhibitors to employee voice come into play. This points to the possibility of a comprehensive approach that combines both *OurVoice* and *OurStrategy*.

8.6.2 An Alternative Mode of Employee Voice

This case study revealed the potential for formal and manager-led employee activities (such as strategy formulation) to incorporate employee voice. The prospect of enhancing employee voice through a manager-led but participatory and employee-driven endeavour is attractive. Bootstrapping stakeholder voice to access employee opinions, concerns, and views, overcomes many of the barriers to speaking up, including their perceptions of voice affordability [110,260] even within a supportive workplace environment [84,253]. Knoll et al.'s recent study [192] examines the relationships of workplace climate, employees' perceived inhibitors and voice. Shifting the context of voicing away from the workspace (to the stakeholder engagement) can implicitly enhance voice. Ellmer and Reichel studied the affordance of employee voice, and noted how 'enhancing insights' can encourage employees to speak up and engage more with the activity [110]. The voice climate within an organisation influences the affordance of voice and depends upon reciprocity and accountability of managers. This is also supported by findings from Case Study 1 outlined in **Chapter 6**.

Similarly, the previous research deployment of the *OurStrategy* process showed how, through the integration of employee voice into the process, an organisation can access richer and more nuanced data and encourage employees to share their (constructive) opinions. Indeed, WorldFish employees who participated in the process contributed their views and expertise through the *Conduct* and *Tag* stages. During the *Conduct* stage, they participated in the dialogue and shared their opinions (due to how *OurStrategy* was tailored towards informal and personalised communication with stakeholders). The *Tag* stage, in turn, provided them with the opportunity to provide constructive input by

identifying the main themes and provide explanations and potential solutions for issues that the organisation faced (or might face in the future). The *OurStrategy* process allowed WorldFish to take advantage of the subjectivity of employees and access stakeholders' voices through the lens of implicit employee voice.

Consequently, through this implicit employee voice approach, *OurStrategy* adheres to the design goal for an alternative realisation and facilitation of employee voice (Design goal 2 - 7.1) by providing an opportunity for expression of employee voice through open (non-anonymous) participation in collection and sense-making of qualitative data. This consultation process combined employee voice, personal experiences, and expertise, with the information provided by respondents (stakeholders). Bootstrapping stakeholder voices can introduce biases due to the subjective nature of tags. Still, such factors can be mitigated through cross-validation and additional analysis of results, as happened during the full study. While the tagging process allows employees to incorporate their perceptions and views by indicating what they see as the most important aspects of interviews, we should be careful not to obscure the original point of the interviewee.

8.6.3 Process Sustainability through Infrastructure Recycling and Minimalistic Digitalization.

Sustainability and continuation are important aspects of the EVP. I introduced these previously in the discussion of actionability and the impact of speaking up (5.6.4), and continuation of the employee voice process through the support of *progression assurance* (6.5.2) and *bounded accountability* (6.5.4). Previous research has considered voice as a continuous process leading to outcomes [330]. For example, Townsend et al. examined the sustainability of the process through the concept of pathways that allow for the tracking of issues from their emergence to decision and resolution, examining its flow and specific barriers. From this perspective, researchers explored how digital tools support the collection of insights [214] and engage in large-scale collaborative activities [195] while addressing barriers. Lambton-Howard et al. showed how the design decisions of a digital tool influenced engagement and the quality of the data produced, and proposed the utilization of existing tools for collaboration (i.e. *un-platforming*

large-scale engagement using social media platforms); while Rainey et al. showed how participatory sense-making can be enhanced and simplified by reducing the required expertise and cost of the qualitative analysis of captured audio data [287].

Similarly, to the previous research, the Case Study 2 has shown how a digitally supported process can enhance the collective voice and simplify participation and analysis. Indeed, its flexibility allowed me to switch the implementation (due to contextual and infrastructural limitations) while still providing the same level of facilitation and ease of participation for employees. In line with the notion of unplatforming [196], the *OurStrategy* process repurposed an existing technology stack (Microsoft Office Suite and Teams). *OurStrategy* can therefore be realised with the minimum set of utilised services (external to the existing organisational infrastructure). I argue that such design can support process sustainability and deeper (e.g., more interviews, more iterations with a different focus, etc.) and faster (i.e., in parallel) exploration of the a domain (strategy consultation in this particular case study). Such arrangements make the governance of the process easier, allowing the administrators to dynamically assign responsibilities, adapt to intermediate results to change focus, and involve different participants (offices, SC members) at each iteration.

Chapter 9 Conclusion

As I have described at length throughout this thesis, facilitating employee voice is now a core ambition for researchers and practitioners involved in organisational development [21,116,211]. When put into practice, effective employee voice arrangements are beneficial for both employers and employees alike. It is a means to help ensure both suitable working arrangements and increase productivity [116,251], and at the same time allows employers to leverage employee expertise and knowledge in organisational decision-making. I have argued that despite the benefits of an organisation having an effective employee voice process – and the evidence of associated benefits are overwhelming – it is hard to achieve in practice in large part due to organisational and personal inhibitors [1]. On the contrary, the absence of voice in the workplace has many negative consequence, including decreased levels of employee collaboration and engagement, and a corresponding (negative) impact on results.

To date, HCI as a discipline has focused on how to enhance participation through digital tools, primarily by supporting workplace collaboration and peer-to-peer interaction [67,201]. In this thesis I expand upon such work, by proposing two novel systems: *OurVoice,* which is designed to address existing barriers in conventional employee voice processes; and *OurStrategy,* a more agile and subtle approach to consultation. Not only do I propose these systems, but I document their design, including their theoretical and empirical underpinnings, and their development, deployment and embedding as a part of an employee voice process in real-world workplace settings. Moreover, as befits a piece of empirical research on employee voice, not only have I engaged with employers in trying to explore EVPs that address real problems, but I have sought to engage employees too. This is probably best illustrated by the fact that in the course of my design, development and (mostly) deployment activities I have involved more than one thousand employees at the organisations involved: Newcastle University, Monash University and WorldFish.

9.1 Revisiting the Research Questions

9.1.1 RQ1: Digital Tools for Employee Voice Facilitation

RQ1. *How can digital tools and anonymity support the creation and facilitation of employee voice?*

To address this research question, I considered the employee voice process through the lens of discourse facilitation. In **Chapter 4**, I investigated and then identified the characteristics that help sustain the constructiveness of discussion and adherence to the social norms of workplace communication, namely *Civility*, *Validity*, *Safety* and *Egalitarianism*. In turn, this conceptualisation of *discussion qualities* (within an employee voice process) helped to define a design space for the employee voice facilitation tool. **Chapter 4** then operationalised these characteristics through a set of specific design goals, including *Assured Anonymity*, *Constructive Moderation*, *Adequate Slowness* and *Controlled Access*, employing them to identify which digital tool can provoke candid and constructive discussion to address real, and perceived, organisational inhibitors [47,253].

Chapter 5 described the design and deployment of the bespoke anonymous employee voice system *OurVoice*, that is, the system at the heart of our first case study. *OurVoice* can be thought of as an operationalisation of these design goals, in that it is outcome of the design process that aimed to develop a system and process that facilitates bottom-up sharing of concerns and issues. Its deployment in a university department enabled us to reflect upon both the design qualities and design goals, and this went some way to demonstrating their utility in that they created an environment that fostered sharing of concerns and *horizontal* connection between employees (i.e. facilitated employee voice). In Case Study 2 we further explored the qualities through the design and deployment of *OurStrategy*, an agile digital architecture which allowed configuration of a process that was responsive to the particular contextual factors at play within WorldFish. *OurStrategy* realised the characteristics of constructive discussion (*Civility*, *Validity*, *Safety* and *Egalitarianism*) very differently to *OurVoice*, and the naïve reader may even struggle to see its relationship to employee voice at all. However,

here is it key to understand that *OurStrategy* infrastructured an employer-led, but employee-driven, consultation process in which employees were given the scope and licence to discuss larger strategic issues with external stakeholders, and then prioritise aspects of those discussions. Moreover, Chapters 7 and 8 show how the design process around the utilisation of already existing digital tools and infrastructure can facilitate this consultation process and leverage the experiences of employees and stakeholders. This, in turn, creates a different notion of anonymity (compared to OurVoice) that rely on mediated and organisational "anonymity" manifested by the expression of opinion and views of employees through the stages of the EVP process (Conduct and Tag stages in Case Study 2).

The ecological validity of the case study deployments (i.e. the participants were employees and employers who actually wanted to effect change) helped me to recognise, and better characterise, the challenges of transferring digitalised voice from online discussions to real-life actions. Of particular salience here was the role of *Moderation & Anonymity*; that they support civil open discussion but serve as a barrier to offline connection and engagement. However, even where suggestions may be acted upon, there remain questions of trust and accountability (**Chapter 5** and **Chapter 6**). Finally, my PhD study provisionally explored the question of how long-term engagement (over a number of weeks or months) might be sustained through the notion of *embedding* employee voice. The wider questions of sustainability and organisational impact are explored through **RQ2**, which was addressed in the both the third cycle of the first case study (**Chapter 6**) and in Case Study 2 (**Chapter 7** and **Chapter 8**).

9.1.2 RQ2: Employee Voice Process Sustainability and Impact

RQ2. *How can we design an Employee Voice Process (EVP) to provide for the impact of employee participation in organisational decision-making and sustain engagement with the EVP within an organisation?*

The iterative nature of the case studies helped identify issues around embedding the EVP, highlighting the necessity of having mechanisms beyond the anonymous digital tool to have any potential for real-world impact. I directly addressed this research question through my deployment of *OurVoice* in the context of an

employer-led EVP that consisted of employee-driven steps, as described in **Chapter 6**. The EVP deployment helped to identify how workplace culture influenced the perceived affordance of the EVP and engagement with *OurVoice*.

This deployment also led to useful design considerations for effective EVP embedment: (i) the provision of *progression assurance*; (ii) a sense of the *bounded accountability* of key parties; and (iii) the importance of *bias reflexivity*. These concerns influenced both the quality of the resulting discussions and their perceived validity. The possibility of the EVP achieving enduring effects was apparent even in the context of a transactional workplace culture.

In Case Study 2, a further application of am Action Research (AR) approach helped obtain a practical understanding of embedding a formal top-down management-led, but employee-driven, voicing process with an organisation strategy consultation process [312]. Subsequent cycles of Case Study 2 described in **Chapter 8** highlighted the influence of the organisational context on the EVP as well as how the flexibility of the design allowed the appropriation of existing infrastructure, and how this helped enhance employee voice through increasing its affordance for employees and providing ability to share views through the acts of engaging with stakeholders and making sense of these interactions. The deployment of the *OurStrategy* process showed how a technology-agnostic approach [196] could help ensure sustainability and inclusivity of employee voice, and allow capture of the employee's implicit voice through their interactions with external stakeholders.

9.2 Limitations

Several limitations of this research are readily apparent, both in terms of the configuration of the fieldwork and the methodology employed. Specific limitations concerning the cycles of the case studies have already been outlined in the discussion subsections of **Chapter 5, Chapter 6** and **Chapter 8**. These include considerations related to anonymity and moderation in subsection 5.6.1 and organisational policies and infrastructure in subsection 8.3.1. There are bigger picture issues too, namely that this work was done using a case study approach

throughout and with this come inherent limitations that arise from the specific nature of the cases used from the use of AR as my research method.

AR has its advantages and limitations [132], in the one hand it helped get at the subtle nuances of the particular articulation of employee voice within the organisation, where these can only be understood in relation to the organisational context, workplace culture, and existing relationships within and between employees and management. On the other hand, use of this highly contextual approach calls into question the generalisability of the results. For example, the research was undertaken in the specific contexts of higher education institutes and international non-governmental and non-for-profit research organisations. These are settings where the workforces have unusually high levels of educational attainment, and an openness and positive disposition towards research and researchers. Additionally, the organisational contexts of the case studies required close alignment with, and accommodation of, the needs and goals of the collaborating organisations. These are not inherent limitations, since they allowed me to conduct research in a real-world scenario focusing on collaborators' issues. However, the generalisability of the findings, beyond the rarefied settings of the case studies, raises questions as to whether the findings can be replicated in other contexts [118]. While generalisability of findings is not a primary goal of AR or case study approaches [118,153], some level of transferability is expected. In my defence, I note that credibility of approaches such as AR and organisational case studies relies upon a their problem-solving ability in the real-world context [143]. In this respect, each of the research projects discussed in the two case studies either directly address collaborators problems (5.5) or are being used to support an ongoing decision making process within the organisations (6.4, 8.4.1): in both cases, they have had a real-world impact.

Another potential limitation of AR, and more specifically with the third cycle of Case Study 1 (**Chapter 6**), is my close engagement with communities and collaborators than what might ordinarily be the case. The Autobiographical Design approach that I employed was discussed in more detail in subsection 6.3, along with the advantages of being a part of the organisational process and obtaining an insider view of the organisation's practices [114,152]. Likewise, being

a 'friendly outsider' [143] in Case Study 2, contributed to the collection of more nuanced data, and opportunities for a deeper understanding of issues that would have been achieved by designing and implementing a research program that framed the employees as conventional research participants.

Finally, in examining digitalisation of employee voice and decision-making in organisational contexts, I employed qualitative research methods to foreground the experiences of the employees and the employer (i.e. management). Thus, my focus was on the experiences of those subject to the intervention, including their perceived understanding, opinion, and feelings [4]. Indeed, in Case Study 2, the use of an iterative process actually requires participants to share their opinions and subjective views and analyse the qualitative data (e.g., comments, text, tags, interview transcripts, recordings) from this perspective. While such a process foreground real-world practices and firsthand experiences, it also introduces a significant degree of subjectivity. This was partially addressed by introducing cross-validation, such as tags verification and summarisation in the WorldFish study (**Chapter 8**). In summary, while I consider subjectivity an important aspect of the study since it deals with the presumptions and opinions of participants, employing differently rigorous methods in similar context would provide further demonstration of the reliability and validity of my results [73,234].

9.3 Future Work: Orchestration Beyond Bottom-up and Top-down Voices

I have examined decision-making within organisations from the perspective of bottom-up (employee-led) and top-down (employer-led) channels of employee voice [178,182,260]. By addressing **RQ1**, Case Study 1 explored the facilitation of 'grassroots' initiatives and the creation of horizontal channels, providing employees with a safe digital space to discuss issues and call for workplace changes. **RQ1** examined how to support collaboration and issues-driven cooperation between employees with the help of *Anonymity* and *Proactive Moderation*. Achieving there design goals of the bottom-up approach led to an EVP that supported constructive discourse in a safe digital space that fostered bottom-up initiative (5.5.3, 6.4.3) and employee engagement (5.5.1, 6.5.1). The top-down

approach, was initially manifest in Case Study 1's third cycle (**Chapter 6**), but was then fully realised in Case Study 2 (**Chapter 8**). Through the lens of **RQ2**, Case Study 2 explored ways of enhancing employee engagement and organisational consultation (**Chapter 8**) with staff members' participation, more completely instantiating a continuous EVP (**Chapter 6**).

However, in both case studies I observed that the sustainability and effectiveness of employee voice are often dependent on the incorporation of a reciprocal approach and involvement of either manager (to support an employee's initiative) or employees (as part of the employer-led process). Indeed, Case Study 1 illustrated how this *mixed* approach was beneficial for the EVP, in the creation of a Task Force Group (TFG) and alternating responsibilities between sessional staff members and managers (*Progression Assurance* and *Bounded Accountability* (6.5)). Likewise, in *OurStrategy* I deliberately integrated bottom-up employee voice through delegation of control of two of four stages.

This indicates the potential value of a more comprehensive understanding of employees' and employers' roles in an EVP and decision-making. The *mixed* approach of employee voice, and alternating control and responsibility between employer and employee, better reflects the class of relational and cooperative EVP that is more likely to be sustained and have real-world impact. Such a process was 'organically' implemented during the third cycle of Case Study 1 (6.3.4) and the employer-employee deliberation process resulted in activities (or stages of the EVP) specifically designated to obtain knowledge and effect organisational improvement (i.e. the Town Hall meeting, the TFG formation, the validation of proposals, and the integration of TFG report recommendations into the faculty's education strategy). Similarly, Case Study 2 was designed to promote knowledge sharing by stakeholders and employees (implicitly through the control they exercised in soliciting stakeholder voice). Thus the role of the participants in the EVP (both managers and employees) was not one of bureaucratic management of control and governance over the process, but one of facilitating knowledge creation and learning as a workplace community. The case study demonstrated how the workplace community could learn new knowledge and explore new ways of dealing with concerns and engaging in future planning. This is exemplified in the

workplace issues identified by members of the department in case study 1 (**Chapter 5**), the aquaculture research problems in the full WorldFish deployment (**Chapter 8**), and management of time and budget constraints by faculty management in the sessional study (**Chapter 6**).

These observations suggest a set of new requirements for digital tools for employee voice facilitation in terms of their ability to support collaborative learning. One can take inspiration (maybe more than inspiration) from the field of Computer-Supported Collaborative Learning (CSCL) which for many years has explored methods for 'effective collaboration' and has developed understandings of 'the role these methods play in mediating interaction' between learners (in our case employees and employers) [92]. In particular, CSCL has examined problem-solving effectiveness, demonstrating how actors with the heterogeneous characteristics can improve in the environment through knowledge inconsistency [300] and highlighting the importance of managing such systems. This observation is aligned with findings from my studies (particularly Case Study 2), which shows how a variety of views and opinions helps produce more nuanced and rich data, but also requires an additional level of coordination.

The coordination and facilitation of group activities play an important role in collaborative learning and is often explored as classroom *orchestration* [122]. Indeed, Fong et al. emphasised that group learning, whether supported by technology or not, requires thoughtful management, including the coordination of activities, available resources and time [122]. *Orchestration* in this context is defined as the group managing to 'maintain progress towards the learning outcome and improvement of practice' [93], where the term *'orchestration'* specifically incorporates a notion of harmonisation of multiple voices [296]. In the *organisational* domain, harmonisation can be the way in which the EVP combines inputs from different actors, and outputs of participatory activities, to form a composed and coherent process, sustaining employee engagement and maximising impact.

Moreover, a similar notion of orchestration exists in software engineering where the term denotes controlling the workflow or architecture which connects

different systems and can dynamically react to the load requirements for the whole system (such as requests number, CPUs performance and amount of data) [279,295]. The emphasis is on flight reactivity and infrastructure flexibility depending on the load (e.g., Lambda functions and Kubernetes orchestration). Indeed, in the EVP context, this quite different sense of orchestration captures the ways the needs for reactive adaptation of the process and activity to contextual factors (**Chapter 6**) and limitations (**Chapter 8**)..

Thus, in the case studies, the role of management in the organisation of the EVP, and the employee and TFG initiatives, can be looked at not only as managing but also orchestrating the processes and learning within the workplace community. Of relevant here is the work of Dillenbourg et al., who discussed an orchestration model for classroom learning [93], identifying and operationalising different factors at play and grouping them into a taxonomy. Building on that, we can conceptualise an EVP taxonomy further through the design factor of process orchestration. This model would examine the enhancement of employee voice and consultation beyond the usual categories of employee voice (2.4) and channels (2.2) and treat it as a more comprehensive and dynamic orchestration exercise that helps an organisation learn as a community of practice.

Execution assurance: the EVP's ability to ensure distribution of control and responsibility over the process and specific activities.

- *Certainty of leadership and control:* this means that at each specific stage and step of EVP, there is a clear actor responsible for the execution and outcomes of the activity (which is linked to the notion of bounded accountability).
- *Execution flexibility:* the ability to react to the dynamics of the process, feedback received and outcomes of the process stages. This also involves providing responsible actors with the ability to change process execution 'on the fly' – as when I changed implementation details and execution logic in the WorldFish case study).
- *Awareness:* Provision of transparency of shift in control and responsibilities for all involved EVP parties. This involves a timely dissemination of

information about activities, progress and process state (linked to the notion of progression assurance and transparency of the process).

Cross-domain integration: this reflects the need for EVP coherence and affordance within the organisational environment.

- *Internal integration:* this refers to the necessity of providing an internal integration of components within the EVP to realise consistent experience at personal, group and whole process-wide levels, and provide smooth transitions between process stages (including progression assurance).
- *External integration:* this refers to the design considerations as to the integration of the EVP within the organisational operations and workplace environment. Case Study 2 exemplifies this, as the *OurStrategy* process was a part of the strategy consultation endeavour and used the existing organisational and technical structure.

Sequentiality: this is the ability of the EVP to incorporate a discrete set of activities into a consistent whole.

- *Linearity:* the sequential nature of EVP activities that can be executed in different organisational contexts and require a similar amount of time and effort.
- *Continuity*: the interdependence of the different stages of the EVP (the output of the previous activity directly inputs to subsequent activities).

Sustainability of effort: the EVP's use of finite time and resources:

- *Finite process:* this refers to EVP being executed within the current time constraints and its nature of having a potentially finite (e.g., a specific set of iterations) number of activities.
- *Minimalism:* the extent to which an EVP can utilise the existing organisational infrastructure and minimise technology or process related burden on employees.
- *Relevance:* the perceived importance of the process to the workplace and the importance of each activity to the whole process.

These new, but provisional, design requirements for an EVP map out a research agenda that will hopefully be the basis for future research.

References

1. Dinislam Abdulgalimov, Reuben Kirkham, James Nicholson, Vasilis Vlachokyriakos, Pam Briggs, and Patrick Olivier. 2020. Designing for Employee Voice. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–13. https://doi.org/10.1145/3313831.3376284

2. ACAS. 2015. *Building Productivity in the UK*. The Advisory, Conciliation and Arbitration Services.

3. Fran Ackermann. 2021. Group support systems: past, present, and future. *Handbook of Group Decision and Negotiation*: 627–654.

4. Anne Adams, Peter Lunt, and Paul Cairns. 2008. A qualitative approach to HCI research. In *Research Methods for Human–Computer Interaction*, Paul Cairns and Anna L. Cox (eds.). Cambridge University Press, Cambridge, 138–157. https://doi.org/10.1017/CBO9780511814570.008

5. Herbert Altrichter, Stephen Kemmis, Robin McTaggart, and Ortrun Zuber-Skerritt. 2002. The concept of action research. *The Learning Organization* 9, 3: 125–131. https://doi.org/10.1108/09696470210428840

6. Deborah G. Ancona and David F. Caldwell. 1992. Bridging the Boundary: External Activity and Performance in Organizational Teams. *Administrative Science Quarterly* 37, 4: 634–665. https://doi.org/10.2307/2393475

7. J. H. Erik Andriessen. 2003. *Working with Groupware*. Springer London, London. https://doi.org/10.1007/978-1-4471-0067-6

8. J. Anitha. 2014. Determinants of employee engagement and their impact on employee performance. *International journal of productivity and performance management* 63, 3: 308–323. http://dx.doi.org/10.1108/IJPPM-01-2013-0008

9. Anonymous. 2015. Tears, tantrums and no pay – my life on a zero-hours contract in the NHS. *the Guardian*. Retrieved August 2, 2021 from http://www.theguardian.com/healthcare-network/views-from-the-nhs-frontline/2015/jun/01/tears-tantrums-no-pay-life-zero-hours-contract-nhs

10. Sinan Aral, Chrysanthos Dellarocas, and David Godes. 2013. Introduction to the Special Issue - Social Media and Business Transformation: A Framework for Research. *Information Systems Research* 24, 1: 3–13. https://doi.org/10.1287/isre.1120.0470

11. Chris Argyris, Robert Putnam, and DM Smith. 1985. *Action science. 1985*. San Francisco: Jossey-Bass.

12. Michael Armstrong. 2006. *A handbook of human resource management practice*. Kogan Page, London ; Philadelphia.

13. Kate Aubusson. 2018. Westmead Hospital ICU stripped of training accreditation over alleged bullying. *The Sydney Morning Herald*. Retrieved September 1, 2019 from https://www.smh.com.au/national/nsw/westmead-hospital-icu-stripped-of-training-accreditation-over-alleged-bullying-20181026-p50c8j.html

14. James B Avey, Tara S Wernsing, and Michael E Palanski. 2012. Exploring the process of ethical leadership: The mediating role of employee voice and psychological ownership. *Journal of Business Ethics* 107, 1: 21–34.

15. Stephen Bach (ed.). 2005. *Managing human resources: personnel management in transition*. Blackwell, Malden, MA.

16. Samuel Bacharach and Peter Bamberger. 2003. The Power of Labor to Grieve: The Impact of the Workplace, Labor Market, and Power-Dependence on Employee Grievance Filing. *Industrial and Labor Relations Review* 57, 4: 518–539.

17. Ronald M Baecker. 2014. *Readings in human-computer interaction: toward the year 2000*. Morgan Kaufmann.

18. Albert Bandura. 1977. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review* 84, 2: 191–215. https://doi.org/10.1037/0033-295X.84.2.191

19. Nicole Renee Baptiste. 2008. Tightening the link between employee wellbeing at work and performance: A new dimension for HRM. *Management Decision* 46, 2: 284–309. https://doi.org/10.1108/00251740810854168

20. Tom Bartindale, Delvin Varghese, Guy Schofield, and Miki Tsukamoto. 2019. Our Story: Addressing Challenges in Development Contexts for Sustainable Participatory Video. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1–12. Retrieved July 11, 2021 from https://doi.org/10.1145/3290605.3300667

21. Michael R. Bashshur and Burak Oc. 2015. When Voice Matters: A Multilevel Review of the Impact of Voice in Organizations. *Journal of Management* 41, 5: 1530–1554. https://doi.org/10.1177/0149206314558302

22. Bernard M. Bass and Bruce J. Avolio. 1993. Transformational leadership and organizational culture. *Public Administration Quarterly* 17, 1: 112–121.

23. Mary Batch and Carol Windsor. 2015. Nursing casualization and communication: a critical ethnography. *Journal of Advanced Nursing* 71, 4: 870–880. https://doi.org/10.1111/jan.12557

24. Rosemary Batt, Alexander J.S. Colvin, and Jeffrey Keefe. 2002. Employee Voice, Human Resource Practices, and Quit Rates: Evidence from the Telecommunications Industry. *ILR Review* 55, 4: 573–594. https://doi.org/10.1177/001979390205500401

25. Brian Bemmels and Janice R. Foley. 1996. Grievance procedure research: A review and theoretical recommendations. *Journal of Management* 22, 3: 359–384. https://doi.org/10.1016/S0149-2063(96)90029-X

26. John Benson and Michelle Brown. 2010. Employee voice: does union membership matter? *Human Resource Management Journal* 20, 1: 80–99. https://doi.org/10.1111/j.1748-8583.2009.00116.x

27. Katharina Berger, Julia Klier, Mathias Klier, and Alexander Richter. 2014. "Who is key...?" - characterizing value adding users in enterprise social networks. *ECIS 2014 Proceedings*. Retrieved from https://aisel.aisnet.org/ecis2014/proceedings/track21/8

28. J. D. Bernal. 1939. *The Social Function of Science.* London: George Routledge & Sons Ltd. Retrieved May 31, 2021 from https://www.cabdirect.org/cabdirect/abstract/19402201466

29. Jeremy Birnholtz, Nicholas Aaron Ross Merola, and Arindam Paul. 2015. Is it weird to still be a virgin: Anonymous, locally targeted questions on facebook confession boards. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*, 2613–2622. https://doi.org/10.1145/2702123.2702410

30. Gro Bjerknes and Tone Bratteteig. 1995. User Participation and Democracy: A Discussion of Scandinavian Research on System Development. 7: 27.

31. Niels Bjørn-Andersen and Bo Hedberg. 1977. Designing information systems in an organizational perspective. *TIMS Studies in the Management Sciences* 5: 125–142.

32. Erik W. Black, Kelsey Mezzina, and Lindsay A. Thompson. 2016. Anonymous social media–Understanding the content and context of Yik Yak. *Computers in Human Behavior* 57: 17–22.

33. Jitske M. C. Both-Nwabuwe, Marjolein Lips-Wiersma, Maria T. M. Dijkstra, and Bianca Beersma. 2020. Understanding the autonomy–meaningful work relationship in nursing: A theoretical framework. *Nursing Outlook* 68, 1: 104–113. https://doi.org/10.1016/j.outlook.2019.05.008

34. Karen Bouchard. 2016. Anonymity as a Double-Edge Sword: Reflecting on the Implications of Online Qualitative Research in Studying Sensitive Topics. *The Qualitative Report* 21, 1: 59–67.

35. Hilary Bradbury. 2015. *The SAGE Handbook of Action Research*. SAGE Publications Ltd, 1 Oliver's Yard, 55 City Road London EC1Y 1SP. https://doi.org/10.4135/9781473921290

36. Erin L. Brady, Yu Zhong, Meredith Ringel Morris, and Jeffrey P. Bigham. 2013. Investigating the appropriateness of social network question asking as a resource for blind users. In *Proceedings of the 2013 conference on Computer supported cooperative work (CSCW '13)*, 1225–1236. https://doi.org/10.1145/2441776.2441915

37. Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 2: 77–101. https://doi.org/10.1191/1478088706qp063oa

38. Andrew D Brown and Christine Coupland. 2005. Sounds of silence: Graduate trainees, hegemony and resistance. *Organization Studies* 26, 7: 1049–1069. https://doi.org/10.1177/0170840605053540

39. Penelope Brown, Stephen C. Levinson, and Stephen C. Levinson. 1987. *Politeness: Some Universals in Language Usage*. Cambridge University Press.

40. Tony Brown, James Goodman, and Keiko Yasukawa. 2010. Academic Casualization in Australia: Class Divisions in the University. *Journal of Industrial Relations* 52, 2: 169–182. https://doi.org/10.1177/0022185609359443

41. Carly S Bruck, Tammy D Allen, and Paul E Spector. 2002. The relation between work–family conflict and job satisfaction: A finer-grained analysis. *Journal of vocational behavior* 60, 3: 336–353. https://doi.org/10.1006/jvbe.2001.1836

42. Alex Bryson, John Forth, and Neil Millward. 2002. *All change at work?: British employment relations 1980-98, portrayed by the workplace industrial relations survey series*. Routledge.

43. John M Bryson. 2015. Strategic Planning for Public and Nonprofit Organizations. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*. Elsevier Inc., 515–521. https://doi.org/10.1016/B978-0-08-097086-8.74043-8

44. John W. Budd and Alexander J. S. Colvin. 2008. Improved Metrics for Workplace Dispute Resolution Procedures: Efficiency, Equity, and Voice. *Industrial Relations* 47, 3: 460–479. https://doi.org/10.1111/j.1468-232X.2008.00529.x

45. John W Budd, Paul J Gollan, and Adrian Wilkinson. 2010. New approaches to employee voice and participation in organizations. *Human Relations* 63, 3: 303–310. https://doi.org/10.1177/0018726709348938

46. Ethan Burris, James Detert, and Dan Chiaburu. 2008. Quitting Before Leaving: The Mediating Effects of Psychological Attachment and Detachment on Voice. *The Journal of applied psychology* 93: 912–22. https://doi.org/10.1037/0021-9010.93.4.912

47. Ethan R. Burris. 2012. The Risks and Rewards of Speaking Up: Managerial Responses to Employee Voice. *Academy of Management Journal* 55, 4: 851–875. https://doi.org/10.5465/amj.2010.0562

48. Ethan R. Burris, James R. Detert, and Alexander C. Romney. 2013. Speaking Up vs. Being Heard: The Disagreement Around and Outcomes of Employee Voice. *Organization Science* 24, 1: 22–38. https://doi.org/10.1287/orsc.1110.0732

49. R Callus, A Morehead, M Cully, and J Buchanan. 1991. Industrial relations at work, commonwealth department of industrial relations.

50. John M. Carroll, Mary Beth Rosson, and Jingying Zhou. 2005. Collective efficacy as a measure of community. In *Proceedings of the SIGCHI conference on human factors in computing systems*, 1–10.

51. Sandro Casal and Luigi Mittone. 2016. Social esteem versus social stigma: The role of anonymity in an income reporting game. *Journal of Economic Behavior & Organization* 124: 55–66. https://doi.org/10.1016/j.jebo.2015.09.014

52. Stevie Chancellor, Yannis Kalantidis, Jessica A Pater, Munmun De Choudhury, and David A Shamma. 2017. Multimodal Classification of Moderated Online Pro-Eating Disorder Content. In *Proceedings of the 35th Annual ACM Conference on Human Factors in Computing Systems (CHI '17)*, 3213–3226. https://doi.org/10.1145/3025453.3025985

53. Laku Chidambaram. 1996. Relational Development in Computer-Supported Groups. *MIS Quarterly* 20, 2: 143–165. https://doi.org/10.2307/249476

54. Laku Chidambaram, Robert P. Bostrom, and Bayard E. Wynne. 1990. A Longitudinal Study of the Impact of Group Decision Support Systems on Group Development. *Journal of Management Information Systems* 7, 3: 7–25. https://doi.org/10.1080/07421222.1990.11517894

55. Laku Chidambaram, Jama D. Summers, Shaila M. Miranda, Amber G. Young, and Robert P. Bostrom. 2021. Time, Technology, and Teams: From GSS to Collective Action.

56. Christie Pei-Yee Chin, Kim-Kwang Raymond Choo, and Nina Evans. 2015. Enterprise Social Networks: A Successful Implementation within a Telecommunication Company. In *In Proceedings of the 21st Americas Conference on Information Systems (AMCIS '15)*, 11.

57. Christie Pei-Yee Chin, Nina Evans, and Kim-Kwang Raymond Choo. 2015. Exploring Factors Influencing the Use of Enterprise Social Networks in Multinational Professional Service Firms. *Journal of Organizational Computing and Electronic Commerce* 25, 3: 289–315. https://doi.org/10.1080/10919392.2015.1058118

58. Andrew Clement. 2017. *Addressing Mass State Surveillance Through Transparency and Network Sovereignty, within a Framework of International Human Rights Law - a Canadian Perspective*. Social Science Research Network, Rochester, NY. Retrieved February 10, 2021 from http://papers.ssrn.com/abstract=3644668

59. Jim Clifton. 2017. The World's Broken Workplace. Retrieved July 22, 2017 from http://www.gallup.com/opinion/chairman/212045/world-broken-workplace.aspx

60. Hamish Coates, Ian R. Dobson, Leo Goedegebuure, and Lynn Meek. 2009. Australia's casual approach to its academic teaching workforce. *Monash University*. Retrieved January 19, 2021 from http://minerva-access.unimelb.edu.au/handle/11343/28917

61. Kevin Coe, Kate Kenski, and Stephen A. Rains. 2014. Online and Uncivil? Patterns and Determinants of Incivility in Newspaper Website Comments. *Journal of Communication* 64, 4: 658–679. https://doi.org/10.1111/jcom.12104

62. David Coghlan. 2019. *Doing Action Research in Your Own Organization*. SAGE.

63. David Coghlan and A B Shani. 2014. Creating Action Research Quality in Organization Development: Rigorous, Reflective and Relevant. 14.

64. Australian Bureau of Commonwealth of Australia; 2018. Data Source - Trade Union Census. Retrieved June 7, 2021 from https://www.abs.gov.au/AUSSTATS/abs@.nsf/0/9FCBBF538897395ACA2570EC001A6CED?OpenDocument

65. Terry Connolly, Leonard M. Jessup, and Joseph S. Valacich. 1990. Effects of Anonymity and Evaluative Tone on Idea Generation in Computer-Mediated Groups. *Management Science* 36, 6: 689–703. https://doi.org/10.1287/mnsc.36.6.689

66. Anna Coote and Jo Lenaghan. 1997. *Citizens' juries: theory into practice*. Institute for Public Policy Research.

67. Jean M. Costa, Marcelo Cataldo, and Cleidson R. de Souza. 2011. The Scale and Evolution of Coordination Needs in Large-scale Distributed Projects: Implications for the Future Generation of Collaborative Tools. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '11), 3151–3160. https://doi.org/10.1145/1978942.1979409

68. John L. Cotton, David A. Vollrath, Kirk L. Froggatt, Mark L. Lengnick-Hall, and Kenneth R. Jennings. 1988. Employee Participation: Diverse Forms and Different Outcomes. *Academy of Management Review* 13, 1: 8–22. https://doi.org/10.5465/amr.1988.4306768

69. Chris W. Coultas, Tripp Driskell, C. Shawn Burke, and Eduardo Salas. 2014. A Conceptual Review of Emergent State Measurement: Current Problems, Future Solutions. *Small Group Research* 45, 6: 671–703. https://doi.org/10.1177/1046496414552285

70. Jill Cowley. 2010. Confronting the Reality of Casualisation in Australia-Recognising Difference and Embracing Sessional Staff in Law Schools. *Queensland U. Tech. L. & Just. J.* 10: 27.

71. Danny Crichton. 2018. HR has lost the trust of employees. Here is who has it now. *TechCrunch*. Retrieved June 25, 2021 from https://social.techcrunch.com/2018/02/10/hr-has-lost-the-trust-of-employees-here-is-who-has-it-now/

72. Mark Cully. 1998. Workplace Employee Relations Survey 1998. 1: 23.

73. Brigitte S. EdD Cypress. 2017. Rigor or Reliability and Validity in Qualitative Research: Perspectives, Strategies, Reconceptualization, and Recommendations. *Dimensions of Critical Care Nursing* 36, 4: 253–263. https://doi.org/10.1097/DCC.0000000000000253

74. Simon Deakin. 2010. Labor and employment laws. *The Oxford Handbook of Empirical Legal Research*: 308–328.

75. Decha Dechawatanapaisal and Sununta Siengthai. 2006. The impact of cognitive dissonance on learning work behavior. *Journal of Workplace Learning* 18, 1: 42–54. https://doi.org/10.1108/13665620610641300

76. Jean-Yves Delort, Bavani Arunasalam, and Cecile Paris. 2011. Automatic Moderation of Online Discussion Sites. *International Journal of Electronic Commerce* 15, 3: 9–30. https://doi.org/10.2753/JEC1086-4415150302

77. W. Edwards (William Edwards) Deming. 1986. *Out of the crisis*. Massachusetts Institute of Technology, Center for Advanced Engineering Study ; Cambridge University Press, Cambridge, Mass. : Cambridge.

78. Daniel R Denison, Gretchen M Spreitzer, and others. 1991. Organizational culture and organizational development: A competing values approach. *Research in organizational change and development* 5, 1: 1–21.

79. Alan Robert Dennis. 1991. Parallelism, anonymity, structure, and group size in electronic meetings. The University of Arizona, United States -- Arizona. Retrieved June 22, 2021 from https://www.proquest.com/docview/303938534/abstract/7DFEA5F0542E491EPQ/1

80. Gerardine DeSanctis and R. Brent Gallupe. 1987. A Foundation for the Study of Group Decision Support Systems. *Management Science* 33, 5: 589–609.

81. Audrey Desjardins and Aubree Ball. 2018. Revealing Tensions in Autobiographical Design in HCI. In *Proceedings of the 2018 Designing Interactive Systems Conference* (DIS '18), 753–764. https://doi.org/10.1145/3196709.3196781

82. James R. Detert and Ethan R. Burris. 2007. Leadership Behavior and Employee Voice: Is the Door Really Open? *The Academy of Management Journal* 50, 4: 869–884. https://doi.org/10.2307/20159894

83. James R Detert and Ethan R Burris. 2007. Leadership behavior and employee voice: Is the door really open? *Academy of management journal* 50, 4: 869–884.

84. James R. Detert and Ethan R. Burris. 2016. Can your employees really speak freely. *Harvard Business Review* 94, 1: 80–87.

85. James R Detert and Ethan R Burris. 2016. Can Your Employees Really Speak Freely? *Harvard Business Review* 94, 1: 80–87.

86. James R Detert, Ethan R Burris, Nathaniel Foote, Kelly Delaney-klinger, Amy Ed-, Dave Harrison, Kathleen O Connor, Chad Pro-, Steve Sauer, and Melissa Thomas-hunt. 2007. Leadership Behavior and Employee Voice: Is the Door Really Open? *Academy of Management Journal* 50, 4: 869–884. https://doi.org/10.5465/AMJ.2007.26279183

87. James R Detert, Ethan R Burris, and David A Harrison. 2010. Debunking four myths about employee silence. *Harvard business review* 88, 6: 26–26.

88. James R Detert, Ethan R. Burris, and David A Harrison. 2010. What's Really Silencing Your Employees. *Harvard Business Review*. Retrieved August 3, 2021 from https://hbr.org/2010/06/whats-really-silencing-your-em

89. James R Detert and Amy C Edmondson. 2011. Implicit voice theories: Taken-for-granted rules of self-censorship at work. *Academy of Management Journal* 54, 3: 461–488.

90. James R Detert and Linda K Treviño. 2010. Speaking up to higher-ups: How supervisors and skip-level leaders influence employee voice. *Organization Science* 21, 1: 249–270.

91. Graham Dietz, Adrian Wilkinson, and Tom Redman. 2010. Involvement and participation. *The SAGE handbook of human resource management*: 245–268.

92. Pierre Dillenbourg, Sanna Järvelä, and Frank Fischer. 2009. The Evolution of Research on Computer-Supported Collaborative Learning. In *Technology-Enhanced Learning: Principles and Products*, Nicolas Balacheff, Sten Ludvigsen, Ton de Jong, Ard Lazonder and Sally Barnes (eds.). Springer Netherlands, Dordrecht, 3–19. https://doi.org/10.1007/978-1-4020-9827-7_1

93. Pierre Dillenbourg and Patrick Jermann. 2010. Technology for Classroom Orchestration. *New Science of Learning: Cognition, Computers and Collaboration in Education*. https://doi.org/10.1007/978-1-4419-5716-0_26

94. Jana Dlouhá and Marie Pospíšilová. 2018. Education for Sustainable Development Goals in public debate: The importance of participatory research in reflecting and supporting the consultation process in developing a vision for Czech education. *Journal of Cleaner Production* 172: 4314–4327. https://doi.org/10.1016/j.jclepro.2017.06.145

95. Inc Docker. 2017. What is a Container? | App Containerization | Docker. Retrieved July 15, 2021 from https://www.docker.com/resources/what-container

96. Jimmy Donaghey, Niall Cullinane, Tony Dundon, and Adrian Wilkinson. 2011. Reconceptualising employee silence: problems and prognosis. *Work, employment and society* 25, 1: 51–67.

97. Jimmy Donaghey, Niall Cullinane, Tony Dundon, and Adrian Wilkinson. 2011. Reconceptualising employee silence: problems and prognosis. *Work, employment and society* 25, 1: 51–67.

98. Sean Donovan, Michelle O'Sullivan, Elaine Doyle, and John Garvey. 2016. Employee voice and silence in auditing firms. *Employee Relations* 38, 4: 563–577.

99. Sean Donovan, Michelle O'Sullivan, Elaine Doyle, and John Garvey. 2016. Employee voice and silence in auditing firms. *Employee Relations* 38, 4: 563–577.

100. Chris Doucouliagos. 1995. Worker Participation and Productivity in Labor-Managed and Participatory Capitalist Firms: A Meta-Analysis. *Industrial and Labor Relations Review* 49, 1: 58–77. https://doi.org/10.2307/2524912

101. Heather Draper, Jonathan Ives, Hardev Pall, Stephen Smith, Sarah Damery, and Sue Wilson. 2009. Reporting end-of-life practice: can we trust doctors to be honest? *Palliative medicine* 23, 7: 673–674.

102. Itiel E. Dror, Jeff Kukucka, Saul M. Kassin, and Patricia A. Zapf. 2018. When Expert Decision Making Goes Wrong: Consensus, Bias, the Role of Experts, and Accuracy. *Journal of Applied Research in Memory and Cognition* 7, 1: 162–163. https://doi.org/10.1016/j.jarmac.2018.01.007

103. Tony Dundon and Derek Rollinson. 2004. *Employment relations in non-union firms*. Routledge.

104. Tony Dundon, Adrian Wilkinson *, Mick Marchington, and Peter Ackers. 2004. The meanings and purpose of employee voice. *The International Journal of Human Resource Management* 15, 6: 1149–1170. https://doi.org/10.1080/0958519041000016773359

105. Morris J. Dworkin. 2015. *SHA-3 Standard: Permutation-Based Hash and Extendable-Output Functions*. National Institute of Standards and Technology. https://doi.org/10.6028/NIST.FIPS.202

106. Amy C Edmondson. 2018. *The fearless organization: Creating psychological safety in the workplace for learning, innovation, and growth*. John Wiley & Sons.

107. Pelle Ehn. 2017. Scandinavian design: On participation and skill. In *Participatory design*. CRC Press, 41–77.

108. Sebastian Eichhorn, Moritz Hans, and Martin Schön-Chanishvili. 2021. A Participatory Multi-Stakeholder Approach to Implementing the Agenda 2030 for Sustainable Development: Theoretical Basis and Empirical Findings. In *A Nexus Approach for Sustainable Development : Integrated Resources Management in Resilient Cities and Multifunctional Land-use Systems*, Stephan Hülsmann and Mahesh Jampani (eds.). Springer International Publishing, Cham, 239–256. https://doi.org/10.1007/978-3-030-57530-4_15

109. Kirsten Ellis, Ross de Vent, Reuben Kirkham, and Patrick Olivier. 2020. Bespoke Reflections: Creating a One-Handed Braille Keyboard. In *The 22nd International ACM SIGACCESS Conference on Computers and Accessibility* (ASSETS '20), 1–13. https://doi.org/10.1145/3373625.3417019

110. Markus Ellmer and Astrid Reichel. 2020. Mind the channel! An affordance perspective on how digital voice channels encourage or discourage employee voice. *Human Resource Management Journal* n/a, n/a. https://doi.org/10.1111/1748-8583.12297

111. Charles R. Emery and Katherine J. Barker. 2007. The Effect of Transactional and Transformational Leadership Styles on the Organizational Commitment and Job Satisfaction of Customer Contact Personnel. *Journal of Organizational Culture, Communications and Conflict* 11, 1: 77–90.

112. Frederick Edmund Emery and Einar Thorsrud. 2013. *Form and content in industrial democracy: Some experiences from Norway and other European countries*. Routledge.

113. Pam Estell, Elizabeth Davidson, and Kaveh Abhari. 2021. *Affording Employee Voice: How Enterprise Social Networking Sites (ESNS) Create New Pathways for Employee Expression*. https://doi.org/10.24251/HICSS.2021.336

114. Roger Evered and Meryl Reis Louis. 1981. Alternative Perspectives in the Organizational Sciences: "Inquiry from the Inside" and "Inquiry from the Outside",,. *Academy of Management Review* 6, 3: 385–395. https://doi.org/10.5465/amr.1981.4285776

115. D Ewing. 1977. Freedom inside the organization. *New York: Dutton*.

116. Fathi Fakhfakh, Virginie Pérotin, and Andrew Robinson. 2011. Workplace Change and Productivity: Does Employee Voice Make a Difference? In *The Role of Collective Bargaining in the Global Economy: Negotiating for Social Justice*. 107–135.

117. Dan Farrell. 1983. Exit, Voice, Loyalty, and Neglect as Responses to Job Dissatisfaction: A Multidimensional Scaling Study. *The Academy of Management Journal* 26, 4: 596–607. https://doi.org/10.2307/255909

118. Daniel Méndez Fernández and Stefan Wagner. 2016. Case studies in industry: what we have learnt. In *Proceedings of the 4th International Workshop on Conducting Empirical Studies in Industry* (CESI '16), 25–31. https://doi.org/10.1145/2896839.2896844

119. Peter Feuille and Denise R. Chachere. 1995. Looking Fair or Being Fair: Remedial Voice Procedures in Nonunion Workplaces. *Journal of Management* 21, 1: 27–42. https://doi.org/10.1177/014920639502100102

120. Jack Fiorito. Industrial Relations - benefits, expenses. Retrieved September 17, 2021 from https://www.referenceforbusiness.com/encyclopedia/Inc-Int/Industrial-Relations.html#ixzz76Mwmbq68

121. Francesca Flood. 2019. Leadership in the Remote, Freelance, and Virtual Workforce Era. In *Global Encyclopedia of Public Administration, Public Policy, and Governance*, Ali Farazmand (ed.). Springer International Publishing, Cham, 1–5. https://doi.org/10.1007/978-3-319-31816-5_3825-1

122. Cresencia Fong, Rebecca M Cober, Richard Messina, Tom Moher, Julia Murray, Ben Peebles, and James D Slotta. 2015. The 3R Orchestration Cycle: Fostering Multi-Modal Inquiry Discourse in a Scaffolded Inquiry Environment. 8.

123. Nicolai J. Foss. 1997. *Resources, Firms, and Strategies: A Reader in the Resource-based Perspective*. Oxford University Press.

124. Sarah Fox, Jill Dimond, Lilly Irani, Tad Hirsch, Michael Muller, and Shaowen Bardzell. 2017. Social Justice and Design: Power and oppression in collaborative systems. In *Companion of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17 Companion), 117–122. https://doi.org/10.1145/3022198.3022201

125. Rolf Fredheim, Alfred Moore, and John Naughton. 2015. *Anonymity and Online Commenting: An Empirical Study*. Social Science Research Network, Rochester, NY. Retrieved April 9, 2018 from https://papers.ssrn.com/abstract=2591299

126. Richard Barry Freeman, Peter F. Boxall, and Peter Haynes. 2007. *What workers say: Employee voice in the Anglo-American workplace*. Cornell University Press.

127. Richard Freeman and James Medoff. 1984. What do unions do. *American Political Science Review* 78, 4: 1098–1099. https://doi.org/10.2307/1955828

128. Roberto Frega, Lisa Herzog, and Christian Neuhäuser. 2019. Workplace democracy—The recent debate. *Philosophy Compass* 14, 4: e12574. https://doi.org/10.1111/phc3.12574

129. Michael R Frone, Marcia Russell, and M Lynne Cooper. 1997. Relation of work–family conflict to health outcomes: A four-year longitudinal study of employed parents. *Journal of Occupational and Organizational psychology* 70, 4: 325–335.

130. Na Fu, Patrick C. Flood, Janine Bosak, Denise M. Rousseau, Tim Morris, and Philip O'Regan. 2017. High-Performance Work Systems in Professional Service Firms: Examining the Practices-Resources-Uses-Performance Linkage. *Human Resource Management* 56, 2: 329–352. https://doi.org/10.1002/hrm.21767

131. Georgina Fuller. Half of employees have witnessed racism at work, says survey. *People Management*. Retrieved April 19, 2018 from https://www.peoplemanagement.co.uk/news/articles/half-employees-witnessed-racism-work

132. Yves-Chantal Gagnon. 2010. *The case study as research method : a practical handbook*.

133. Inc Gallup. 2017. State of the American Workplace. *Gallup.com*. Retrieved June 23, 2021 from https://www.gallup.com/workplace/238085/state-american-workplace-report-2017.aspx

134. Andrew Garbett, Rob Comber, Edward Jenkins, and Patrick Olivier. 2016. App Movement: A Platform for Community Commissioning of Mobile Applications. In *Proceedings of the 2016 CHI Conference on*

Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, 26–37. Retrieved September 4, 2021 from https://doi.org/10.1145/2858036.2858094

135. Elihu M. Gerson. 2008. Reach, Bracket, and the Limits of Rationalized Coordination: Some Challenges for CSCW. In *Resources, Co-Evolution and Artifacts*. Springer London, London, 193–220. https://doi.org/10.1007/978-1-84628-901-9_8

136. Lisa Giermindl. 2018. Lost in Digital Transformation? The role of Enterprise Social Networks in facilitating digital collaboration. Passau, Passau.

137. Geoff Gilfillan. 2018. Characteristics and use of casual employees in Australia. *Statistics and Mapping, Parliamentary Services, Canberra, Australia*.

138. Michael J. Glauser. 1984. Upward Information Flow in Organizations: Review and Conceptual Analysis. *Human Relations* 37, 8: 613–643. https://doi.org/10.1177/001872678403700804

139. Jessica Glenza and Alan Yuhas. 2015. University of Missouri faces backlash over response to attack threat. *the guardian*. Retrieved October 9, 2017 from https://www.theguardian.com/us-news/2015/nov/11/university-of-missouri-under-fire-again-over-response-to-attack-threat

140. GMB. 2019. Revealed: scandal of 30,000 NHS workers on zero hours contracts. *GMB*. Retrieved August 2, 2021 from https://www.gmb.org.uk/news/revealed-scandal-30000-nhs-workers-zero-hours-contracts

141. Howard Gospel and Stephen Wood. 2003. Representing workers in modern Britain. In *Representing Workers*. Routledge.

142. Roy Green. 1991. Change and Involvement at the Workplace: Evidence from the Australian Workplace Industrial Relations Survey. *The Economic and Labour Relations Review* 2, 1: 72–88. https://doi.org/10.1177/103530469100200106

143. Davydd J Greenwood. 2007. *Introduction to action research : social research for social change.*

144. Brian T. Gregory, Stanley G. Harris, Achilles A. Armenakis, and Christopher L. Shook. 2009. Organizational culture and effectiveness: A study of values, attitudes, and organizational outcomes. *Journal of Business Research* 62, 7: 673–679. https://doi.org/10.1016/j.jbusres.2008.05.021

145. Emily E. Griffith, Kathryn Kadous, and Chad A. Proell. 2020. Friends in low places: How peer advice and expected leadership feedback affect staff auditors' willingness to speak up. *Accounting, Organizations and Society* 87: 101153. https://doi.org/10.1016/j.aos.2020.101153

146. PostgreSQL Global Development Group. 2021. PostgreSQL. *PostgreSQL*. Retrieved August 17, 2021 from https://www.postgresql.org/

147. Jonathan Grudin. 1994. Computer-supported cooperative work: History and focus. *Computer* 27, 5: 19–26.

148. Jonathan Grudin and Steven Poltrock. 2012. Taxonomy and theory in computer supported cooperative work. *The Oxford handbook of organizational psychology* 2: 1323–1348.

149. David E. Guest and Riccardo Peccei. 2001. Partnership at Work: Mutuality and the Balance of Advantage. *British Journal of Industrial Relations* 39, 2: 207–236. https://doi.org/10.1111/1467-8543.00197

150. Amjad Hadjikhani and Peter Thilenius. 2005. The impact of horizontal and vertical connections on relationships' commitment and trust. *Journal of Business & Industrial Marketing* 20, 3: 136–147. https://doi.org/10.1108/08858620510592759

151. Jari J Hakanen, Wilmar B Schaufeli, and Kirsi Ahola. 2008. The Job Demands-Resources model: A three-year cross-lagged study of burnout, depression, commitment, and work engagement. *Work & Stress* 22, 3: 224–241.

152. Margaret Harris. 2001. The place of self and reflexivity in third sector scholarship: An exploration. *Nonprofit and Voluntary Sector Quarterly* 30, 4: 747–760.

153. Gillian R. Hayes. 2011. The relationship of action research to human-computer interaction. *ACM Transactions on Computer-Human Interaction* 18, 3: 15:1-15:20. https://doi.org/10.1145/1993060.1993065

154. STEPHEN C. Hayne and RONALD E. Rice. 1997. Attribution accuracy when using anonymity in group support systems. *International Journal of Human-Computer Studies* 47, 3: 429–452. https://doi.org/10.1006/ijhc.1997.0134

155. Peter Haynes, Peter Boxall, and Keith Macky. 2005. Non-Union Voice and the Effectiveness of Joint Consultation in New Zealand. *Economic and Industrial Democracy* 26, 2: 229–256. https://doi.org/10.1177/0143831X05051517

156. Frank Heller, Eugen Pusic, George Strauss, and Bernhard Wilpert. 1998. *Organizational participation: Myth and reality*. Oxford University Press.

157. Michael Hicks. 2017. The Myth and the Reality of Manufacturing in America. *Center for Business and Economic Research*: 7.

158. Barry T Hirsch. 2003. *What Do Unions Do for Economic Performance?*

159. Albert O Hirschman. 1970. *Exit, voice and loyalty*. Cambridge, MA: Harvard university press.

160. Peter Holland, Brian K. Cooper, Amanda Pyman, and Julian Teicher. 2012. Trust in management: the role of employee voice arrangements and perceived managerial opposition to unions. *Human Resource Management Journal* 22, 4: 377–391. https://doi.org/10.1111/1748-8583.12002

161. Peter Holland, Brian Cooper, and Cathy Sheehan. 2017. Employee Voice, Supervisor Support, and Engagement: The Mediating Role of Trust. *Human Resource Management* 56, 6: 915–929. https://doi.org/10.1002/hrm.21809

162. Aemilian Hron and Helmut F Friedrich. 2003. A review of web-based collaborative learning: factors beyond technology. *Journal of Computer Assisted Learning* 19, 1: 70–79.

163. Clyde Eiríkur Hull and Brian H. Lio. 2006. Innovation in non-profit and for-profit organizations: Visionary, strategic, and financial considerations. *Journal of Change Management* 6, 1: 53–65. https://doi.org/10.1080/14697010500523418

164. Jessica Iacono, Ann Brown, and Clive Holtham. 2009. Research Methods–a Case Example of Participant Observation. *Electronic journal of business research methods* 7, 1.

165. Lilly C. Irani and M. Six Silberman. 2013. Turkopticon: interrupting worker invisibility in amazon mechanical turk. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13), 611–620. https://doi.org/10.1145/2470654.2470742

166. Michael Isaac. 2015. A Founder of Secret, the Anonymous Social App, Is Shutting It Down. *The New York Times*. Retrieved September 15, 2017 from https://www.nytimes.com/2015/04/30/technology/a-founder-of-secret-the-anonymous-social-app-shuts-it-down-as-use-declines.html

167. Gazi Islam and Michael J. Zyphur. 2005. Power, Voice, and Hierarchy: Exploring the Antecedents of Speaking Up in Groups. *Group Dynamics: Theory, Research, and Practice* 9, 2: 93–103. https://doi.org/10.1037/1089-2699.9.2.93

168. Leonard M. Jessup, Terry Connolly, and Jolene Galegher. 1990. The Effects of Anonymity on GDSS Group Process with an Idea-Generating Task. *MIS Quarterly* 14, 3: 313–321. https://doi.org/10.2307/248893

169. Leonard Michael Jessup. 1989. The deindividuating effects of anonymity on automated group idea generation. Retrieved June 22, 2021 from https://repository.arizona.edu/handle/10150/184806

170. Shagun . Jhaver, Amy . Bruckman, and Eric . Gilbert. 2019. Does Transparency in Moderation Really Matter?: User Behavior After Content Removal Explanations on Reddit. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW: 1–27. https://doi.org/10.1145/3359252

171. Shan Jiang, Ronald E. Robertson, and Christo Wilson. 2020. Reasoning about Political Bias in Content Moderation. *Proceedings of the AAAI Conference on Artificial Intelligence* 34, 09: 13669–13672. https://doi.org/10.1609/aaai.v34i09.7117

172. Robert Johansen. 1988. *GroupWare: Computer Support for Business Teams*. The Free Press, New York, NY, USA.

173. Iryna Y. Johnson. 2006. *Examining Part-Time Faculty Utilization and Its Impact on Student Retention at a Public Research University*. Retrieved January 19, 2021 from https://eric.ed.gov/?id=ED493826

174. Adam N Joinson. 2001. Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European journal of social psychology* 31, 2: 177–192.

175. Somayyeh Kamalou, Krystelle Shaughnessy, and David A. Moscovitch. 2019. Social anxiety in the digital age: The measurement and sequelae of online safety-seeking. *Computers in Human Behavior* 90: 10–17. https://doi.org/10.1016/j.chb.2018.08.023

176. Gerald C. Kane. 2017. The evolutionary implications of social media for organizational knowledge management. *Information and Organization* 27, 1: 37–46. https://doi.org/10.1016/j.infoandorg.2017.01.001

177. Ruogu Kang, Stephanie Brown, and Sara Kiesler. 2013. Why do people seek anonymity on the internet? informing policy and design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13), 2657–2666. https://doi.org/10.1145/2470654.2481368

178. Jeffrey W. Kassing. 2002. Speaking Up: Identifying Employees' Upward Dissent Strategies. *Management Communication Quarterly* 16, 2: 187–209. https://doi.org/10.1177/089331802237234

179. Bruce E Kaufman and Daphne Gottlieb Taras. 2016. *Nonunion employee representation: history, contemporary practice and policy*. Routledge.

180. Jasmeet Kaur, Asra Sakeen Wani, and Pushpendra Singh. 2019. Engagement of Pregnant Women and Mothers over WhatsApp: Challenges and Opportunities Involved. In *Conference Companion Publication of the 2019 on Computer Supported Cooperative Work and Social Computing* (CSCW '19), 236–240. https://doi.org/10.1145/3311957.3359481

181. John Kelly and Paul Willman. 2004. *Union Organization and Activity*. Taylor & Francis Group, London, UNITED KINGDOM. Retrieved June 7, 2021 from http://ebookcentral.proquest.com/lib/monash/detail.action?docID=200161

182. Ian Kessler, Roger Undy, and Paul Heron. 2004. Employee perspectives on communication and consultation: findings from a cross-national survey. *The International Journal of Human Resource Management* 15, 3: 512–532. https://doi.org/10.1080/0958519042000181232

183. D. Marc Kilgour and Colin Eden (eds.). 2021. *Handbook of Group Decision and Negotiation*. Springer International Publishing, Cham. https://doi.org/10.1007/978-3-030-49629-6

184. Peter G Kilner and Christopher M Hoadley. 2005. Anonymity options and professional participation in an online community of practice. In *Proceedings of th 2005 conference on Computer support for collaborative learning: learning 2005: the next 10 years!*, 272–280.

185. Jaewon Kim, John Paul MacDuffie, and Frits K Pil. 2010. Employee voice and organizational performance: Team versus representative influence. *Human Relations* 63, 3: 371–394. https://doi.org/10.1177/0018726709348936

186. Peter Kinnaird, Laura Dabbish, Sara Kiesler, and Haakon Faste. 2013. Co-worker transparency in a microtask marketplace. In *Proceedings of the 2013 conference on Computer supported cooperative work* (CSCW '13), 1285–1290. https://doi.org/10.1145/2441776.2441921

187. Ben Kirman, Shaun Lawson, Conor Linehan, Francesco Martino, Luciano Gamberini, and Andrea Gaggioli. 2010. Improving social game engagement on facebook through enhanced socio-contextual information. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1753–1756. Retrieved September 16, 2021 from https://doi.org/10.1145/1753326.1753589

188. Ben Kirman, Conor Lineham, and Shaun Lawson. 2012. Exploring mischief and mayhem in social computing or: how we learned to stop worrying and love the trolls. In *CHI '12 Extended Abstracts on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 121–130. Retrieved September 16, 2021 from https://doi.org/10.1145/2212776.2212790

189. Brian S. Klaas and Angelo S. DeNisi. 1989. Managerial Reactions to Employee Dissent: The Impact of Grievance Activity on Performance Ratings. *The Academy of Management Journal* 32, 4: 705–717. https://doi.org/10.2307/256565

190. Brian S Klaas, Julie B Olson-Buchanan, and Anna-Katherine Ward. 2012. The determinants of alternative forms of workplace voice: An integrative perspective. *Journal of Management* 38, 1: 314–345.

191. Brian S. Klaas and Anna-Katherine Ward. 2015. Formal, Justice-oriented voice in the nonunion firm: who speaks up and when? *Industrial Relations: A Journal of Economy and Society* 54, 2: 321–356.

192. Michael Knoll, Pedro Neves, Birgit Schyns, and Bertolt Meyer. 2021. A Multi-Level Approach to Direct and Indirect Relationships between Organizational Voice Climate, Team Manager Openness, Implicit Voice Theories, and Silence. *Applied Psychology* 70, 2: 606–642. https://doi.org/10.1111/apps.12242

193. Michael Knoll and Tom Redman. 2016. Does the Presence of Voice Imply the Absence of Silence? The Necessity to Consider Employees' Affective Attachment and Job Engagement. *Human Resource Management* 55, 5: 829–844. https://doi.org/10.1002/hrm.21744

194. Nina Krüger, Tobias Brockmann, and Stefan Stieglitz. 2013. A Framework for Enterprise Social Media Guidelines. *AMCIS 2013 Proceedings*. Retrieved from https://aisel.aisnet.org/amcis2013/EndUserIS/GeneralPresentations/8

195. Daniel Lambton-Howard, Robert Anderson, Kyle Montague, Andrew Garbett, Shaun Hazeldine, Carlos Alvarez, John A. Sweeney, Patrick Olivier, Ahmed Kharrufa, and Tom Nappey. 2019. WhatFutures: Designing Large-Scale Engagements on WhatsApp. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–14. Retrieved June 30, 2021 from https://doi.org/10.1145/3290605.3300389

196. Daniel Lambton-Howard, Patrick Olivier, Vasilis Vlachokyriakos, Hanna Celina, and Ahmed Kharrufa. 2020. Unplatformed Design: A Model for Appropriating Social Media Technologies for Coordinated Participation. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1–13. Retrieved July 4, 2021 from https://doi.org/10.1145/3313831.3376179

197. Cliff Lampe and Paul Resnick. 2004. Slash (dot) and burn: distributed moderation in a large online conversation space. In *Proceedings of the 22nd Annual ACM Conference on Human Factors in Computing Systems (CHI '04)*, 543–550.

198. C. Larman and V.R. Basili. 2003. Iterative and incremental developments. a brief history. *Computer* 36, 6: 47–56. https://doi.org/10.1109/MC.2003.1204375

199. Sven Laumer, N. Sadat Shami, Michael Muller, and Werner Geyer. 2017. The Challenge of Enterprise Social Networking (Non-)Use at Work: A Case Study of How to Positively Influence Employees' Enterprise Social Networking Acceptanc. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17)*, 978–994. https://doi.org/10.1145/2998181.2998309

200. Christopher A. Le Dantec, Mariam Asad, Aditi Misra, and Kari E. Watkins. 2015. Planning with Crowdsourced Data: Rhetoric and Representation in Transportation Planning. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing (CSCW '15)*, 1717–1727. https://doi.org/10.1145/2675133.2675212

201. Charlotte P. Lee and Drew Paine. 2015. From The Matrix to a Model of Coordinated Action (MoCA): A Conceptual Framework of and for CSCW. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing (CSCW '15)*, 179–194. https://doi.org/10.1145/2675133.2675161

202. Fiona Lee. 1997. When the Going Gets Tough, Do the Tough Ask for Help? Help Seeking and Power Motivation in Organizations. *Organizational Behavior and Human Decision Processes* 72, 3: 336–363. https://doi.org/10.1006/obhd.1997.2746

203. Fiona Lee. 2002. The Social Costs of Seeking Help. *The Journal of Applied Behavioral Science* 38, 1: 17–35. https://doi.org/10.1177/0021886302381002

204. Paul M. Leonardi. 2011. When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies. *MIS Quarterly* 35, 1: 147–167. https://doi.org/10.2307/23043493

205. Paul M. Leonardi, Marleen Huysman, and Charles Steinfield. 2013. Enterprise Social Media: Definition, History, and Prospects for the Study of Social Technologies in Organizations. *Journal of Computer-Mediated Communication* 19, 1: 1–19. https://doi.org/10.1111/jcc4.12029

206. Jeffrey LePine and Linn Van Dyne. 1998. Predicting Voice Behavior in Work Groups. *Journal of Applied Psychology* 83: 853–868. https://doi.org/10.1037/0021-9010.83.6.853

207. Emanuele Lettieri, Francesca Borga, and Alberto Savoldelli. 2004. Knowledge management in non-profit organizations. *Journal of Knowledge Management* 8, 6: 16–30. https://doi.org/10.1108/13673270410567602

208. Kurt Lewin. 1946. Action research and minority problems. *Journal of social issues* 2, 4: 34–46.

209. Qinglan Li and Ioana Literat. 2017. Misuse or misdesign? Yik Yak on college campuses and the moral dimensions of technology design. *First Monday*. https://doi.org/10.5210/fm.v22i7.6947

210. Jian Liang, Crystal IC Farh, and Jiing-Lih Farh. 2012. Psychological antecedents of promotive and prohibitive voice: A two-wave examination. *Academy of Management Journal* 55, 1: 71–92.

211. Robert C Liden, Talya N Bauer, and Berrin Erdogan. 2004. The role of leader-member exchange in the dynamic relationship between employer and employee: Implications for employee socialization, leaders, and organizations. *The employment relationship: Examining psychological and contextual perspectives*: 226–250.

212. Jae-Eun Lim, Joonhwan Lee, and Dongwhan Kim. 2021. The Effects of Feedback and Goal on the Quality of Crowdsourcing Tasks. *International Journal of Human–Computer Interaction* 0, 0: 1–13. https://doi.org/10.1080/10447318.2021.1876355

213. Richard M Locke and Hiram Samel. 2018. Beyond the Workplace:"Upstream" Business Practices and Labor Standards in the Global Electronics Industry. *Studies in Comparative International Development* 53, 1: 1–24.

214. Kristen Lovejoy and Gregory D. Saxton. 2012. Information, Community, and Action: How Nonprofit Organizations Use Social Media*. *Journal of Computer-Mediated Communication* 17, 3: 337–353. https://doi.org/10.1111/j.1083-6101.2012.01576.x

215. Haiwei Ma, Hao-Fei Cheng, Bowen Yu, and Haiyi Zhu. 2019. Effects of Anonymity, Ephemerality, and System Routing on Cost in Social Question Asking. *Proceedings of the ACM on Human-Computer Interaction* 3, GROUP: 238:1-238:21. https://doi.org/10.1145/3361119

216. Stephen Machin. 2000. Union Decline in Britain. *British Journal of Industrial Relations* 38, 4: 631–645. https://doi.org/10.1111/1467-8543.00183

217. Penny Mackieson, Aron Shlonsky, and Marie Connolly. 2019. Increasing rigor and reducing bias in qualitative research: A document analysis of parliamentary debates using applied thematic analysis. *Qualitative Social Work* 18, 6: 965–980. https://doi.org/10.1177/1473325018786996

218. Haley MacLeod, Ben Jelen, Annu Prabhakar, Lora Oehlberg, Katie A. Siek, and Kay Connelly. 2017. A Guide to Using Asynchronous Remote Communities (ARC) for Researching Distributed Populations. *EAI Endorsed Trans. Pervasive Health Technol.* 3, 11: e4.

219. Haley MacLeod, Ben Jelen, Annu Prabhakar, Lora Oehlberg, Katie Siek, and Kay Connelly. 2016. Asynchronous remote communities (ARC) for researching distributed populations. In *Proceedings of the 10th EAI International Conference on Pervasive Computing Technologies for Healthcare* (PervasiveHealth '16), 1–8.

220. Haley MacLeod, Kim Oakes, Danika Geisler, Kay Connelly, and Katie Siek. 2015. Rare World: Towards Technology for Rare Diseases. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1145–1154. Retrieved July 4, 2021 from https://doi.org/10.1145/2702123.2702494

221. Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, and Steven P. Dow. 2018. CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1–14. Retrieved September 4, 2021 from https://doi.org/10.1145/3173574.3173769

222. Narges Mahyar, Diana V. Nguyen, Maggie Chan, Jiayi Zheng, and Steven P. Dow. 2019. The Civic Data Deluge: Understanding the Challenges of Analyzing Large-Scale Community Input. In *Proceedings of the 2019 on Designing Interactive Systems Conference* (DIS '19), 1171–1181. https://doi.org/10.1145/3322276.3322354

223. Ann Majchrzak, Samer Faraj, Gerald C Kane, and Bijan Azad. 2013. The Contradictory Influence of Social Media Affordances on Online Communal Knowledge Sharing. 18.

224. Jennifer Manuel and Clara Crivellaro. 2020. Place-Based Policymaking and HCI: Opportunities and Challenges for Technology Design. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1–16. Retrieved July 11, 2021 from https://doi.org/10.1145/3313831.3376158

225. Chang M. Mao and David C. DeAndrea. 2019. How Anonymity and Visibility Affordances Influence Employees' Decisions About Voicing Workplace Concerns. *Management Communication Quarterly* 33, 2: 160–188. https://doi.org/10.1177/0893318918813202

226. Mick Marchington. 2008. Employee Voice Systems. *The Oxford Handbook of Human Resource Management*. https://doi.org/10.1093/oxfordhb/9780199547029.003.0012

227. Mick Marchington and Jane Suter. 2013. Where Informality Really Matters: Patterns of Employee Involvement and Participation (EIP) in a Non-Union Firm. *Industrial Relations: A Journal of Economy and Society* 52, s1: 284–313. https://doi.org/10.1111/irel.12004

228. Mick Marchington, Adrian Wilkinson, Peter Ackers, and Tony Dundon. 2001. *Management Choice and Employee Voice*.

229. Gloria Mark, Shamsi Iqbal, Mary Czerwinski, and Paul Johns. 2015. Focused, Aroused, but So Distractible: Temporal Perspectives on Multitasking and Communications. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (CSCW '15), 903–916. https://doi.org/10.1145/2675133.2675221

230. J. Nathan Matias, Sarah Szalavitz, and Ethan Zuckerman. 2017. FollowBias: Supporting Behavior Change Toward Gender Equality by Networked Gatekeepers on Social Media. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17), 1082–1095. https://doi.org/10.1145/2998181.2998287

231. David C. Matz and Wendy Wood. 2005. Cognitive Dissonance in Groups: The Consequences of Disagreement. *Journal of Personality and Social Psychology* 88, 1: 22–37. https://doi.org/10.1037/0022-3514.88.1.22

232. Timothy D. Maynes and Philip M. Podsakoff. 2014. Speaking more broadly: An examination of the nature, antecedents, and consequences of an expanded set of employee voice behaviors. *Journal of Applied Psychology* 99, 1: 87–112. https://doi.org/10.1037/a0034284

233. Douglas M. McCabe and David Lewin. 1992. Employee Voice: A Human Resource Management Perspective. *California Management Review* 34, 3: 112–123. https://doi.org/10.2307/41167427

234. Nora McDonald, Sarita Schoenebeck, and Andrea Forte. 2019. Reliability and Inter-rater Reliability in Qualitative Research: Norms and Guidelines for CSCW and HCI Practice. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW: 72:1-72:23. https://doi.org/10.1145/3359174

235. Terry McIlwee. 2001. Collective Bargaining. In *European Labour Relations*. Routledge.

236. Donald S. McPherson. 1989. The Modern Grievance Procedure in the United States Book Reviews. *Labor Studies Journal* 14, 4: 104–106.

237. Alexander Merz, Isabella Seeber, and Ronald Maier. 2015. Social Meets Structure: Revealing Team Collaboration Activities and Effects in Enterprise Social Networks. *ECIS 2015 Completed Research Papers*. https://doi.org/10.18151/7217430

238. Christian Meske and Ireti Amojo. 2020. *Enterprise Social Bots as Perception-Benefactors of Social Network Affordances*.

239. John P. Meyer and Natalie J. Allen. 1988. Links between work experiences and organizational commitment during the first year of employment: A longitudinal analysis*. *Journal of Occupational Psychology* 61, 3: 195–209. https://doi.org/10.1111/j.2044-8325.1988.tb00284.x

240. Armstrong Michael. 2006. A handbook of human resource management practice. *Cambridge University Press, India* 4843, 24: 878–889.

241. Corporation Microsoft. 2020. Microsoft Power Query. Retrieved July 28, 2021 from https://powerquery.microsoft.com/en-us/

242. James G Miller. 1972. Living systems: The organization. *Systems Research and Behavioral Science* 17, 1: 1–182.

243. Frances J Milliken, Elizabeth W Morrison, and Patricia F Hewlin. 2003. An exploratory study of employee silence: Issues that employees don't communicate upward and why. *Journal of management studies* 40, 6: 1453–1476.

244. Shaila M. Miranda and Carol S. Saunders. 2003. The Social Construction of Meaning: An Alternative Perspective on Information Sharing. *Information Systems Research* 14, 1: 87–106. https://doi.org/10.1287/isre.14.1.87.14765

245. Philip Mirvis. 2012. Employee Engagement and CSR: Transactional, Relational, and Developmental Approaches. *California Management Review* 54, 4: 93–117. https://doi.org/10.1525/cmr.2012.54.4.93

246. Robert D. Mohr and Cindy Zoghi. 2008. High-Involvement Work Design and Job Satisfaction. *Industrial and Labor Relations Review* 61, 3: 275–296.

247. Mark H. Moore. 2000. Managing for Value: Organizational Strategy in for-Profit, Nonprofit, and Governmental Organizations. *Nonprofit and Voluntary Sector Quarterly* 29, 1_suppl: 183–204. https://doi.org/10.1177/0899764000291S009

248. Robert H. Moorman. 1991. Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship? *Journal of Applied Psychology* 76, 6: 845–855. https://doi.org/10.1037/0021-9010.76.6.845

249. Alison Morehead, Mairi Steele, Micheal Alexander, Kerry Stephen, and Linton Duffin. 1997. Changes at work: The 1995 Australian workplace industrial relations survey: A summary of the major findings. *Canberra, Department of Workplace Relations and Small Business*.

250. Elizabeth W. Morrison. 2011. Employee Voice Behavior: Integration and Directions for Future Research. *Academy of Management Annals* 5, 1: 373–412. https://doi.org/10.5465/19416520.2011.574506

251. Elizabeth W. Morrison. 2014. Employee Voice and Silence. *Annual Review of Organizational Psychology and Organizational Behavior* 1, 1: 173–197. https://doi.org/10.1146/annurev-orgpsych-031413-091328

252. Elizabeth Wolfe Morrison and Frances J. Milliken. 2000. Organizational Silence: A Barrier to Change and Development in a Pluralistic World. *The Academy of Management Review* 25, 4: 706–725. https://doi.org/10.2307/259200

253. Elizabeth Wolfe Morrison, Sara L Wheeler-Smith, and Dishan Kamdar. 2011. Speaking up in groups: a cross-level study of group voice climate and voice. *Journal of Applied Psychology* 96, 1: 183.

254. Morrison and Corey C. Phelps. 1999. Taking Charge at Work: Extrarole Efforts to Initiate Workplace Change. *The Academy of Management Journal* 42, 4: 403–419. https://doi.org/10.2307/257011

255. Dave Mote and Karl Heil. Human Resource Management (HRM) - duties, benefits. Retrieved September 17, 2021 from https://www.referenceforbusiness.com/encyclopedia/Gov-Inc/Human-Resource-Management-HRM.html

256. Paula K. Mowbray, Adrian Wilkinson, and Herman H.M. Tse. 2015. An Integrative Review of Employee Voice: Identifying a Common Conceptualization and Research Agenda: Employee Voice: Review and Research Agenda. *International Journal of Management Reviews* 17, 3: 382–400. https://doi.org/10.1111/ijmr.12045

257. Mike Murphy. 2015. Companies are already stopping employees from using this new app to gossip about work. *Quartz*. Retrieved June 25, 2021 from https://qz.com/328290/companies-are-already-stopping-employees-from-using-this-new-app-to-gossip-about-work/

258. Fiona Myers, Elinor Dickie, and Martin Taulbut. 2018. Employee voice and mental wellbeing: A rapid evidence review. 16.

259. Adams Nager and Robert D. Atkinson. 2015. *The Myth of America's Manufacturing Renaissance: The Real State of U.S. Manufacturing*. Social Science Research Network, Rochester, NY. Retrieved May 31, 2021 from https://papers.ssrn.com/abstract=3066391

260. Eva Nechanska, Emma Hughes, and Tony Dundon. 2020. Towards an integration of employee voice and silence. *Human Resource Management Review* 30, 1: 100674. https://doi.org/10.1016/j.hrmr.2018.11.002

261. Carman Neustaedter and Phoebe Sengers. 2012. Autobiographical design in HCI research: designing and learning through use-it-yourself. In *Proceedings of the Designing Interactive Systems Conference* (DIS '12), 514–523. https://doi.org/10.1145/2317956.2318034

262. Thi Thao Duyen T. Nguyen, Thomas Garncarz, Felicia Ng, Laura A. Dabbish, and Steven P. Dow. 2017. Fruitful Feedback: Positive Affective Language and Source Anonymity Improve Critique Reception and Work Outcomes. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17), 1024–1034. https://doi.org/10.1145/2998181.2998319

263. Vlad Niculae and Cristian Danescu-Niculescu-Mizil. 2016. Conversational Markers of Constructive Discussions. Retrieved September 8, 2019 from https://arxiv-org.ezproxy.lib.monash.edu.au/abs/1604.07407v1

264. Beth Simone Noveck. 2004. The electronic revolution in rulemaking. *Emory LJ* 53: 433.

265. Beth Simone Noveck. 2004. The electronic revolution in rulemaking. *Emory LJ* 53: 433.

266. Judith Odili Uchidiuno, Jessica Hammer, Ken Koedinger, and Amy Ogan. 2021. Fostering Equitable Help-Seeking for K-3 Students in Low Income and Rural Contexts. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (CHI '21), 1–14. https://doi.org/10.1145/3411764.3445144

267. Michael P. O'Driscoll, Steven Poelmans, Paul E. Spector, Thomas Kalliath, Tammy D. Allen, Cary L. Cooper, and Juan I. Sanchez. 2013. Family-Responsive Interventions, Perceived Organizational and Supervisor Support, Work-Family Conflict, and Psychological Strain. In *From Stress to Wellbeing Volume 2: Stress Management and Enhancing Wellbeing*, Cary L. Cooper (ed.). Palgrave Macmillan UK, London, 229–245. https://doi.org/10.1057/9781137309341_14

268. Abby Ohlheiser. 2017. Analysis | How James Damore went from Google employee to right-wing Internet hero. *Washington Post*. Retrieved April 13, 2018 from https://www.washingtonpost.com/news/the-intersect/wp/2017/08/12/how-james-damore-went-from-google-employee-to-right-wing-internet-hero/

269. Julie B Olson-Buchanan and Wendy R Boswell. 2002. The role of employee loyalty and formality in voicing discontent. *Journal of Applied Psychology* 87, 6: 1167.

270. Julie B Olson-Buchanan and Wendy R Boswell. 2002. The role of employee loyalty and formality in voicing discontent. *Journal of Applied Psychology* 87, 6: 1167.

271. Julie B Olson-Buchanan and Wendy R Boswell. 2008. An integrative model of experiencing and responding to mistreatment at work. *Academy of Management Review* 33, 1: 76–96.

272. W. v Osch, C. W. Steinfield, and B. A. Balogh. 2015. Enterprise Social Media: Challenges and Opportunities for Organizational Communication and Collaboration. In *In Proceedings of 2015 48th Hawaii International Conference on System Sciences (HICSS'15)*, 763–772. https://doi.org/10.1109/HICSS.2015.97

273. Wietske Osch and Charles W Steinfield. 2013. Boundary spanning through enterprise social software: an external stakeholder perspective. 18.

274. Adam Ozimek. 2020. *Future Workforce Report*. Social Science Research Network, Rochester, NY. https://doi.org/10.2139/ssrn.3787530

275. Zizi Papacharissi. 2004. Democracy online: civility, politeness, and the democratic potential of online political discussion groups. *New Media & Society* 6, 2: 259–283. https://doi.org/10.1177/1461444804041444

276. Zizi Papacharissi. 2004. Democracy online: civility, politeness, and the democratic potential of online political discussion groups. *New Media & Society* 6, 2: 259–283. https://doi.org/10.1177/1461444804041444

277. Etienne Papegnies, Vincent Labatut, Richard Dufour, and Georges Linarès. 2019. Conversational Networks for Automatic Online Moderation. *IEEE Transactions on Computational Social Systems* 6, 1: 38–55. https://doi.org/10.1109/TCSS.2018.2887240

278. Henry Pelling. 2016. *A History of British Trade Unionism*. Springer.

279. C. Peltz. 2003. Web services orchestration and choreography. *Computer* 36, 10: 46–52. https://doi.org/10.1109/MC.2003.1236471

280. Alisa Percy and Rosemary Beaumont. 2008. The casualisation of teaching and the subject at risk. *Studies in Continuing Education* 30, 2: 145–157. https://doi.org/10.1080/01580370802097736

281. Alisa Percy, Michele Scoufis, Sharron Parry, Allan Goody, Margaret Hicks, Ian Macdonald, Kay Martinez, Nick Szorenyi-Reischl, Yoni Ryan, and Sandra Wills. 2008. The RED Report, Recognition-Enhancement-Development: The contribution of sessional teachers to higher education.

282. Richard B. Peterson and David Lewin. 2000. Research on unionized grievance procedures: Management issues and recommendations. *Human Resource Management* 39, 4: 395–406. https://doi.org/10.1002/1099-050X(200024)39:4<395::AID-HRM9>3.0.CO;2-4

283. G. V. Portus. 1935. The Historical Role of Trade Unionism. *Economic Record* 10, 1: 16–30. https://doi.org/10.1111/j.1475-4932.1935.tb02763.x

284. Tom Postmes and Russell Spears. 2002. Behavior online: Does anonymous computer communication reduce gender inequality? *Personality and Social Psychology Bulletin* 28, 8: 1073–1083.

285. Annu Sible Prabhakar, Lucia Guerra-Reyes, Vanessa M. Kleinschmidt, Ben Jelen, Haley MacLeod, Kay Connelly, and Katie A. Siek. 2017. Investigating the Suitability of the Asynchronous, Remote, Community-based Method for Pregnant and New Mothers. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 4924–4934. Retrieved July 4, 2021 from https://doi.org/10.1145/3025453.3025546

286. John Purcell and Peter Boxall. 2015. *Strategy and Human Resource Management*. Macmillan Education UK, London, UNITED KINGDOM. Retrieved August 5, 2020 from http://ebookcentral.proquest.com/lib/monash/detail.action?docID=4763425

287. Jay Rainey, Kyle Montague, Pamela Briggs, Robert Anderson, Thomas Nappey, and Patrick Olivier. 2019. Gabber: Supporting Voice in Participatory Qualitative Practices. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–12. Retrieved June 28, 2021 from https://doi.org/10.1145/3290605.3300607

288. Bill Reader. 2012. Free press vs. free speech? The rhetoric of "civility" in regard to anonymous online comments. *Journalism & Mass Communication Quarterly* 89, 3: 495–513.

289. J. Recker, A. Malsbender, and T. Kohlborn. 2016. Using Enterprise Social Networks as Innovation Platforms. *IT Professional* 18, 2: 42–49. https://doi.org/10.1109/MITP.2016.23.

290. Bruce A. Reinig and Bongsik Shin. 2002. The Dynamic Effects of Group Support Systems on Group Meetings. *Journal of Management Information Systems* 19, 2: 303–325. https://doi.org/10.1080/07421222.2002.11045728

291. Hillary Reinsberg. 2013. How Juicy Campus' Founder Became The Poster Boy For Internet Niceness. *BuzzFeed*. Retrieved September 14, 2017 from https://www.buzzfeed.com/hillaryreinsberg/juicy-campus-founder-poster-boy-for-internet-kindness?utm_term=.sx3GvrBW8z#.ry6qLbk2n3

292. Mark de Reuver, Carsten Sørensen, and Rahul C. Basole. 2018. The Digital Platform: A Research Agenda. *Journal of Information Technology* 33, 2: 124–135. https://doi.org/10.1057/s41265-016-0033-3

293. Julia Richardson, Dorothy Wardale, and Linley Lord. 2019. The 'double-edged sword' of a sessional academic career. *Higher Education Research & Development* 38, 3: 623–637. https://doi.org/10.1080/07294360.2018.1545749

294. Alexander Richter and Kai Riemer. 2013. The contextual nature of enterprise social networking: A multi case study comparison. In *Richter, Alexander; Riemer, Kai (2013). The contextual nature of enterprise social networking: A multi case study comparison. In: The 21st European Conference on Information Systems (ECIS) 2013, Utrecht, 6 June 2013 - 8 June 2013.* https://doi.org/info:doi/10.5167/uzh-89259

295. Fulvio Giovanni Ottavio Risso. 2017. End-to-end service orchestration across SDN and cloud computing domains. Retrieved September 8, 2021 from https://core.ac.uk/reader/84350220

296. Jeremy Roschelle, Yannis Dimitriadis, and Ulrich Hoppe. 2013. Classroom orchestration: Synthesis. *Computers & Education* 69: 523–526. https://doi.org/10.1016/j.compedu.2013.04.010

297. Denise M. Rousseau. 1989. Psychological and implied contracts in organizations. *Employee Responsibilities and Rights Journal* 2, 2: 121–139. https://doi.org/10.1007/BF01384942

298. Kevin Ruck, Mary Welch, and Barbara Menara. 2017. Employee voice: An antecedent to organisational engagement? *Public Relations Review* 43, 5: 904–914. https://doi.org/10.1016/j.pubrev.2017.04.008

299. Niloufar Salehi, Lilly C. Irani, Michael S. Bernstein, Ali Alkhatib, Eva Ogbe, Kristy Milland, and Clickhappier. 2015. We Are Dynamo: Overcoming Stalling and Friction in Collective Action for Crowd Workers. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (CHI '15), 1621–1630. https://doi.org/10.1145/2702123.2702508

300. Neeta Sarode and J. W. Bakal. 2021. Toward Effectual Group Formation Method for Collaborative Learning Environment. In *Sustainable Communication Networks and Application* (Lecture Notes on Data Engineering and Communications Technologies), 351–361. https://doi.org/10.1007/978-981-15-8677-4_29

301. Marshall Sashkin. 1976. Changing toward Participative Management Approaches: A Model and Methods. *The Academy of Management Review* 1, 3: 75–86. https://doi.org/10.2307/257275

302. Edgar H. Schein. 2010. *Organizational Culture and Leadership*. John Wiley & Sons.

303. Scott Schieman, Paul Glavin, and Melissa A. Milkie. 2009. When Work Interferes with Life: Work-Nonwork Interference and the Influence of Work-Related Demands and Resources. *American Sociological Review* 74, 6: 966–988. https://doi.org/10.1177/000312240907400606

304. Kjeld Schmidt and Carla Simonee. 1996. Coordination mechanisms: Towards a conceptual foundation of CSCW systems design. *Computer Supported Cooperative Work (CSCW)* 5, 2: 155–200. https://doi.org/10.1007/BF00133655

305. Randall S Schuler. 1987. Personnel and human resource management choices and organizational strategy. *People and Strategy* 10, 1: 1.

306. Joseph Seering. 2020. Reconsidering Self-Moderation: the Role of Research in Supporting Community-Based Models for Online Content Moderation. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW2: 1–28. https://doi.org/10.1145/3415178

307. Joseph Seering, Robert Kraut, and Laura Dabbish. 2017. Shaping Pro and Anti-Social Behavior on Twitch Through Moderation and Example-Setting. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17), 111–125. https://doi.org/10.1145/2998181.2998277

308. Joseph Seering, Robert Kraut, and Laura Dabbish. 2017. Shaping Pro and Anti-Social Behavior on Twitch Through Moderation and Example-Setting. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17), 111–125. https://doi.org/10.1145/2998181.2998277

309. Jeffrey J. Selingo. 2017. Wanted: Factory Workers, Degree Required. *The New York Times*. Retrieved May 31, 2021 from https://www.nytimes.com/2017/01/30/education/edlife/factory-workers-college-degree-apprenticeships.html

310. N. Sadat Shami, Jiang Yang, Laura Panc, Casey Dugan, Tristan Ratchford, Jamie C. Rasmussen, Yannick M. Assogba, Tal Steier, Todd Soule, Stela Lupushor, Werner Geyer, Ido Guy, and Jonathan Ferrar. 2014. Understanding Employee Social Media Chatter with Enterprise Social Pulse. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing* (CSCW '14), 379–392. https://doi.org/10.1145/2531602.2531650

311. Arthur Sharp. Organizational Behavior - benefits. Retrieved September 17, 2021 from https://www.referenceforbusiness.com/encyclopedia/Oli-Per/Organizational-Behavior.html

312. Katie A. Siek, Gillian R. Hayes, Mark W. Newman, and John C. Tang. 2014. Field Deployments: Knowing from Using in Context. In *Ways of Knowing in HCI*, Judith S. Olson and Wendy A. Kellogg (eds.). Springer, New York, NY, 119–142. https://doi.org/10.1007/978-1-4939-0378-8_6

313. Vivek K. Singh, Marie L. Radford, Qianjia Huang, and Susan Furrer. 2017. "They Basically Like Destroyed the School One Day": On Newer App Features and Cyberbullying in Schools. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17), 1210–1216. https://doi.org/10.1145/2998181.2998279

314. Katherine Sobering. 2019. Watercooler Democracy: Rumors and Transparency in a Cooperative Workplace. *Work and Occupations* 46, 4: 411–440. https://doi.org/10.1177/0730888419860176

315. Vivek Srinivasan, Vibhore Vardhan, Snigdha Kar, Siddhartha Asthana, Rajendran Narayanan, Pushpendra Singh, Dipanjan Chakraborty, Amarjeet Singh, and Aaditeshwar Seth. 2013. Airavat: an automated system to increase transparency and accountability in social welfare schemes in India. In *Proceedings of the Sixth International Conference on Information and Communications Technologies and Development: Notes - Volume 2* (ICTD '13), 151–154. https://doi.org/10.1145/2517899.2517937

316. Motherboard Staff. 2019. Here's the Memo Currently Going Viral at Google. *Vice*. Retrieved September 1, 2019 from https://www.vice.com/en_us/article/mbmqxq/heres-the-memo-currently-going-viral-at-google

317. Robert E. Stake. 1995. *The art of case study research*. Sage Publications, Thousand Oaks.

318. Elmer Fly Steensen. 2014. Five types of organizational strategy. *Scandinavian Journal of Management* 30, 3: 266–281. https://doi.org/10.1016/j.scaman.2013.10.003

319. Gunnar Stevens, Volkmar Pipek, and Volker Wulf. 2009. Appropriation Infrastructure: Supporting the Design of Usages. In *End-User Development* (Lecture Notes in Computer Science), 50–69. https://doi.org/10.1007/978-3-642-00427-8_4

320. Daniel Stieger, Kurt Matzler, Sayan Chatterjee, and Florian Ladstaetter-Fussenegger. 2012. Democratizing Strategy: How Crowdsourcing Can Be Used for Strategy Dialogues. *California Management Review* 54, 4: 44–68. https://doi.org/10.1525/cmr.2012.54.4.44

321. Stefan Stieglitz, Kai Riemer, and Christian Meske. 2014. Hierarchy or activity? The role of formal and informal influence in eliciting responses from enterprise social networks. *ECIS 2014 Proceedings*. Retrieved from https://aisel.aisnet.org/ecis2014/proceedings/track07/12

322. Anselm Strauss. 1988. The Articulation of Project Work: An Organizational Process. *The Sociological Quarterly* 29, 2: 163–178.

323. George Strauss. 2006. Worker Participation—Some Under-Considered Issues. *Industrial Relations: A Journal of Economy and Society* 45, 4: 778–803. https://doi.org/10.1111/j.1468-232X.2006.00451.x

324. Lucy Suchman. 1996. Supporting Articulation Work. In *Computerization and Controversy*. Elsevier, 407–423. https://doi.org/10.1016/B978-0-12-415040-9.50118-4

325. John Suler. 2004. The Online Disinhibition Effect. *CyberPsychology & Behavior* 7, 3: 321–326. https://doi.org/10.1089/1094931041291295

326. Subrahmaniam Tangirala and Rangaraj Ramanujam. 2008. Exploring Nonlinearity in Employee Voice: The Effects of Personal Control and Organizational Identification. *The Academy of Management Journal* 51, 6: 1189–1203.

327. Gareth Terry, Nikki Hayfield, Victoria Clarke, and Virginia Braun. 2017. Thematic analysis. *The Sage handbook of qualitative research in psychology*: 17–37.

328. Linda Thomas. 1991. The relationship between work-family role conflict, family supportive work policies and stress: A control perspective.

329. Einar Thorsrud and Fred E. Emery. 1970. Industrial Democracy in Norway. *Industrial Relations: A Journal of Economy and Society* 9, 2: 187–196. https://doi.org/10.1111/j.1468-232X.1970.tb00505.x

330. Keith Townsend, Adrian Wilkinson, Tony Dundon, and Paula K. Mowbray. 2020. Tracking employee voice: developing the concept of voice pathways. *Asia Pacific Journal of Human Resources* n/a, n/a. https://doi.org/10.1111/1744-7941.12271

331. UCU. 2018. UCU announces 14 strike dates at 61 universities in pensions row. Retrieved June 19, 2021 from https://www.ucu.org.uk/14-strike-dates

332. Joseph S. Valacich, Leonard M. Jessup, Alan R. Dennis, and J. F. Nunamaker. 1992. A conceptual framework of anonymity in Group Support Systems. *Group Decision and Negotiation* 1, 3: 219–241. https://doi.org/10.1007/BF00126264

333. Harry J Van Buren and Michelle Greenwood. 2008. Enhancing employee voice: Are voluntary employer–employee partnerships enough? *Journal of Business Ethics* 81, 1: 209–221.

334. Andrea Veltman. 2016. *Meaningful Work*. Oxford University Press USA - OSO, Oxford, United States. Retrieved June 16, 2021 from http://ebookcentral.proquest.com/lib/monash/detail.action?docID=4707129

335. Vijaya Venkataramani, Giuseppe Joe Labianca, and Travis Grosser. 2013. Positive and negative workplace relationships, social satisfaction, and organizational attachment. *Journal of applied psychology* 98, 6: 1028.

336. John Viega and David Evans. 2000. Separation of concerns for security. In *ICSE 2000 Workshop on Multi-Dimensional Separation of Concerns in Software Engineering*, 126–129.

337. Jessica Vitak, Kalyani Chadha, Linda Steiner, and Zahra Ashktorab. 2017. Identifying Women's Experiences With and Strategies for Mitigating Negative Effects of Online Harassment. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17), 1231–1245. https://doi.org/10.1145/2998181.2998337

338. Sidney Webb. 1897. *Industrial democracy,*. London,. Retrieved from http://hdl.handle.net/2027/uc1.a0009278979

339. WERS. 2012. *The 2011 Workplace Employment Relations Study (WERS)*. Retrieved June 7, 2021 from https://www.gov.uk/government/publications/the-2011-workplace-employment-relations-study-wers

340. Mark E. Whiting, Dilrukshi Gamage, Snehalkumar (Neil) S. Gaikwad, Aaron Gilbee, Shirish Goyal, Alipta Ballav, Dinesh Majeti, Nalin Chhibber, Angela Richmond-Fuller, Freddie Vargus, Tejas Seshadri Sarma, Varshine Chandrakanthan, Teogenes Moura, Mohamed Hashim Salih, Gabriel Bayomi Tinoco Kalejaiye, Adam Ginzberg, Catherine A. Mullings, Yoni Dayan, Kristy Milland, Henrique Orefice, Jeff Regino, Sayna Parsi, Kunz Mainali, Vibhor Sehgal, Sekandar Matin, Akshansh Sinha, Rajan Vaish, and Michael S. Bernstein. 2017. Crowd Guilds: Worker-led Reputation and Feedback on Crowdsourcing Platforms. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (CSCW '17), 1902–1913. https://doi.org/10.1145/2998181.2998234

341. Zack Whittaker. 2018. At Blind, a security lapse revealed private complaints from Silicon Valley employees. *TechCrunch*. Retrieved June 25, 2021 from https://social.techcrunch.com/2018/12/20/blind-anonymous-app-data-exposure/

342. Adrian Wilkinson, Michael Barry, and Elizabeth Morrison. 2020. Toward an integration of research on employee voice. *Human Resource Management Review* 30, 1: 100677. https://doi.org/10.1016/j.hrmr.2018.12.001

343. Adrian Wilkinson, Tony Dundon, and Mick Marchington. 2012. Employee Involvement and Voice. In *Managing Human Resources*. John Wiley & Sons, Ltd, 268–288. https://doi.org/10.1002/9781119208235.ch13

344. Adrian Wilkinson, Tony Dundon, Mick Marchington, and Peter Ackers. 2004. Changing patterns of employee voice: Case studies from the UK and Republic of Ireland. *Journal of Industrial Relations* 46, 3: 298–322.

345. Adrian Wilkinson, Keith Townsend, and John Burgess. 2013. Reassessing employee involvement and participation: Atrophy, reinvigoration and patchwork in Australian workplaces. *Journal of Industrial Relations* 55, 4: 583–600.

346. Kirsty Williamson and Graeme Johanson. 2017. *Research Methods: Information, Systems, and Contexts*. Chandos Publishing.

347. John L. Wilson, Thomas E. Griffin, and Leonard M. Jessup. 2010. Gss Anonymity Effects on Small Group Behavior. *Academy of Information and Management Sciences Journal* 13, 2: 41–57.

348. Stephen J. Wood and Mark P. Fenton-O'Creevy. 2005. Direct Involvement, Representation and Employee Voice in UK Multinationals in Europe. *European Journal of Industrial Relations* 11, 1: 27–50. https://doi.org/10.1177/0959680105050399

349. Nicola Woolcock. 2018. University lecturers to strike as students sit summer exams. Retrieved June 19, 2021 from https://www.thetimes.co.uk/article/university-lecturers-to-strike-as-students-sit-summer-exams-2jmmxlsbx

350. Scott Wright. 2006. Government-run online discussion fora: Moderation, censorship and the shadow of control. *The British Journal of Politics and International Relations* 8, 4: 550–568.

351. Scott Wright. 2006. Government-run online discussion fora: Moderation, censorship and the shadow of control. *The British Journal of Politics and International Relations* 8, 4: 550–568.

352. Jing Zhou and Jennifer M. George. 2003. Awakening employee creativity: The role of leader emotional intelligence. *The Leadership Quarterly* 14, 4: 545–568. https://doi.org/10.1016/S1048-9843(03)00051-1

353. Ortrun Zuber-skerritt. 2001. Action Learning and Action Research: Paradigm, Praxis and Programs. In *Effective change Management through Action Learning and Action Research: Concepts, Perspectives, Processes and Applications. Lismore: Southern Cross*, 1–20.

354. Marieke Zwaanswijk and Sandra van Dulmen. 2014. Advantages of asynchronous online focus groups and face-to-face focus groups as perceived by child, adolescent and adult participants: a survey study. *BMC Research Notes* 7, 1: 756. https://doi.org/10.1186/1756-0500-7-756

355. 2019. Patients Like Me Forum (https://www.patientslikeme.com/).

356. 2019. Microsoft Bot Framework. Retrieved July 16, 2021 from https://dev.botframework.com/

357. 2019. Amazon Transcribe – Speech to Text - AWS. *Amazon Web Services, Inc.* Retrieved July 19, 2021 from https://aws.amazon.com/transcribe/

358. 2020. Azure Cosmos DB – Non-relational database | Microsoft Azure. Retrieved July 16, 2021 from https://azure.microsoft.com/en-au/services/cosmos-db/

359. 2020. Speech-to-Text: Automatic Speech Recognition. *Google Cloud*. Retrieved July 19, 2021 from https://cloud.google.com/speech-to-text

360. 2020. Trade union membership, August 2020 | Australian Bureau of Statistics. Retrieved June 7, 2021 from https://www.abs.gov.au/statistics/labour/earnings-and-work-hours/trade-union-membership/latest-release

361. 2021. trade union | Definition, History, & Facts. *Encyclopedia Britannica*. Retrieved June 7, 2021 from https://www.britannica.com/topic/trade-union

362. 2021. Cognitive Services – APIs for AI Developers | Microsoft Azure. Retrieved July 16, 2021 from https://azure.microsoft.com/en-au/services/cognitive-services/

363. 2021. What is Azure Load Balancer? - Azure Load Balancer. Retrieved July 16, 2021 from https://docs.microsoft.com/en-us/azure/load-balancer/load-balancer-overview

364. 2021. Overview of Microsoft Graph - Microsoft Graph. Retrieved July 16, 2021 from https://docs.microsoft.com/en-us/graph/overview

365. 2021. Otter Voice Meeting Notes. Retrieved July 19, 2021 from https://otter.ai

366. NGINX | High Performance Load Balancer, Web Server, & Reverse Proxy. *NGINX*. Retrieved August 17, 2021 from https://www.nginx.com/

367. World Fish Center | WorldFishCenter. Retrieved July 5, 2021 from https://www.worldfishcenter.org/

368. WorldFish 2030 Research and Innovation Strategy: Aquatic Foods for Healthy People and Planet. *WorldFish*. Retrieved July 5, 2021 from https://www.worldfishcenter.org/strategy-2030

369. NodeJS About. *Node.js*. Retrieved July 19, 2021 from https://nodejs.org/en/about/

370. Cognitive Services Compliance and Privacy | Microsoft Azure. Retrieved July 19, 2021 from https://azure.microsoft.com/en-us/support/legal/cognitive-services-compliance-and-privacy/

371. Security in Amazon Transcribe - Amazon Transcribe. Retrieved July 19, 2021 from https://docs.aws.amazon.com/transcribe/latest/dg/security.html

372. Data logging | Cloud Speech-to-Text Documentation. *Google Cloud*. Retrieved July 19, 2021 from https://cloud.google.com/speech-to-text/docs/data-logging

373. Otter.ai Privacy Policy. *Blogs - Otter.ai*. Retrieved July 19, 2021 from https://blog.otter.ai/privacy-policy/

374. Build apps for the Microsoft Teams platform - Teams. Retrieved July 22, 2021 from https://docs.microsoft.com/en-us/microsoftteams/platform/overview

Appendices

Appendix A. List of abbreviations

ABS	Australian Bureau of Statistics
ACAS	Advisory, Conciliation and Arbitration Services of Great Britain
ACM	Association for Computing Machinery
AR	Action Research
ARC	Asynchronous Remote Communities
BMGF	Bill & Melinda Gates Foundation
CGIAR	Consortium of International Agricultural Research
CNSS	Cornell National Social Survey
CPU	Central Process Unit
CSCW	Computer-Supported Cooperative Work
DB	Database
ESN	Enterprise Social Networks
ESNS	Enterprise Social Networking Sites
EVP	Employee Voice Process
GDPR	General Data Protection Regulation
GSS	Group Supporting Systems
HCI	Human-Compute Interaction
HEI	Higher Education Institution
HRM	Human Resource Management
ICT	Information and Communication Technology
IFRC	International Federation of Red Cross and Red Crescent Societies
IM	Instant Messanger
IR	Industrial Relations
JSON	JavaScript Object Notation
JWT	JSON WEB Token
KII	Key Informant Interviews
ML	Machine Learning

NoSQL	Not Only SQL
OB	Organisational Behaviour
PD	Participatory Design
PM	Process Master
RAM	Random Access Memory
RESTful	representational state transfer (service)
RS	Researcher (WorldFish)
SC	Steering Committee
SCO	
SD	Sustainable Development
SDG	Sustainable Development Goals
SDK	Software Development Kit
SG	Steering Group
SIS	Small indigenous specifies
SQL	Structured Query Language
ST	Stakeholder
TFG	Task and Finish Group
WF	WorldFish
XML	Extensible Markup Language

Appendix B.

WorldFish study (case study 2) Initial questions.

[Introduction – See Interview Protocol Document] *Information regarding the project, its aims and reasons behind this interview.*			
[Consent Form - See Interview Protocol Document] *Ensure consent form introduced, permission sought from participant, and informed that can withdraw from the interview at any point*			
Interview Questionnaire **Questions to be administered to all stakeholder unless otherwise noted – internal/external only.* **Fish and aquatic foods/livelihoods research – relates to all WorldFish research on fisheries and aquaculture (inland/marine) and broader aquatic organisms (plants/animals) and ecosystems*			
No.	**Questions**	**Probing - Sub-Questions)**	**Stakeholders to Ask**
	A. Research Experiences		
1	What research/working areas do you currently work on or have experience in, within your organisation?	• What areas of fish and aquatic foods/livelihoods research do you focus on? (food systems –nutrition, value chain, gender, economics, climate change, etc.) • At what scale? And context (rural/urban etc) • Level of experience?	All
	B. Future Research Vision		
2	In your opinion, what are the future key challenges of fish and aquatic foods/livelihoods research to 2030?	• Please list the key challenges and explain why. • What key challenges should WorldFish focus on to 2030? Rank the top 3 in order of importance. [Open ended]	All
3	In your view, what impact areas of fish and aquatic foods/livelihoods research should WorldFish focus on to 2030 in order to address these challenges?	• What are the key impact areas of fish and aquatic foods/livelihoods research in addressing these challenges? • What are you doing now in these areas?	All

		• Key areas for WorldFish future research to focus on? Please rank the top 3. 　[List of impact areas – 　　• Sustainable aquatic food systems 　　• Nutrition & food security 　　• Environmental health & biodiversity 　　• Poverty reduction, livelihoods & jobs 　　• Gender equality, youth & inclusive food systems 　　• Climate adaptation & greenhouse gas reduction 　　• Other – please specify]	
C. Research Impact Areas				
Please answer according to participant's expertise – not all impact areas may be appropriate to answer.				
4	Nutrition & food security	• What fish and aquatic foods/livelihoods research are you working on in this area? • How can research have an impact in this area? • Key areas that require more research focus in the future? • Key actions for our WorldFish future agenda?	Tailored to stakeholder's expertise
5	Environmental health & biodiversity	• What fish and aquatic foods/livelihoods research are you working on in this area? • How can research have an impact in this area? • Key areas that require more research focus in the future? • Key actions for our WorldFish future agenda?	
6	Poverty reduction, livelihoods & jobs	• What fish and aquatic foods/livelihoods research are you working on in this area? • How can research have an impact in this area? • Key areas that require more research focus in the future? • Key actions for our WorldFish future agenda?	
7	Gender equality, youth & inclusive food systems	• What fish and aquatic foods/livelihoods research are you working on in this area? • How can research have an impact in this area? • Key areas that require more research focus in the future? • Key actions for our WorldFish future agenda?	
8	Climate adaptation & greenhouse gas reduction	• What fish and aquatic foods/livelihoods research are you working on in this area? • How can research have an impact in this area? • Key areas that require more research focus in the future?	

		• Key actions for our WorldFish future agenda?	
9	[Overarching impact area] Sustainable (social, economic, environmental) food systems for healthy diets	• What fish and aquatic foods/livelihoods research are you working on in this area? • What are we currently doing well? • Key areas that require more research focus in the future? (across fish – agri systems) • Key actions for our WorldFish future agenda?	All
D. Partnerships & Management
10	In your opinion, how can we work more effectively on research and impact in these priority areas?	• Lessons learnt? (from projects, programmes, management etc) • How can we improve research quality? • Improve research relevance – connection to global discourses (e.g. food systems)? • What areas should we focus on improving in WorldFish future Research Strategy and why?	All
11	What current and future partnerships are needed to generate positive impact in these areas across scale?	• How are we working well with partnerships across sectors for impact? • How can we work better? • Key actions for our WorldFish future agenda?	All
12	**(If internal).** Are there areas of the internal research process and management at WorldFish we can improve on in our future strategy?	• Transparency and ability to voice opinions, ideas, feedback? • Key actions for our WorldFish future agenda?	WorldFish Staff
13	**(If external).** How might we collaborate differently to better deliver research and impact / or tackle these global challenges?	• How can we improve collaboration on research/impact at multiple levels? (country, regional, other)	External stakeholders
14	**(If external).** How might we strengthen communication and knowledge exchange to better achieve our shared goals?	• What aspects are important and require more attention? • What is underdeveloped in your opinion?	External stakeholders
E. General
15	Any question, idea, or an issue that you want to raise or discuss? Something we have missed.		All

16	Final question: if you have to decide on the top 3 aims (research areas or actions) that should be addressed by WorldFish Research Strategy 2022-2030, what will they be?	• In what impact areas? • Why these 3?	All

[Debrief]

Next steps of research strategy process and communication. See Interview Protocol.

Appendix C.

WorldFish study (Case Study 2) Final questions

1. Could you tell me about yourself and what do you do?
 	
[4min]
	- What areas are you working in?
	   o Probe: development, policy, sector etc.
	   o What type of work do you do?
	   o Probe: scale - local/sub-national, national, regional, global,
	   o Context - rural, urban

2. How does your work, if at all, relate to aquatic foods? *(Defined as all aquatic organisms used as food or as feed).* **[4min]**	- Probe: finfish, shellfish, aquatic plants, other aquatic animals. - Types of systems: capture fisheries, aquaculture, mixed, and environment - marine, brackish and inland freshwater.

3. What do you think will be the biggest challenges facing your area of work in relation to aquatic foods over the next 5 to 10 years?
 	
[7min]
	- Probe specific areas based on expertise:
	   o Environment - biodiversity, climate.
	   o Social and economic – poverty, livelihoods, wellbeing, gender, inclusive economic growth, governance, value chains.
	   o Nutrition, food safety and health.
	   o Financing and Innovation.
	- What are some of the broader challenges of aquatic foods in food systems?
	- Have you thought about any possible solutions to these challenges?

4. What are the key challenges facing aquatic foods that nobody is focusing on? **[5min]**	- Probe: Could you explain why these are important and not being addressed? - What needs to be done to address these challenges and in your view who should address them?
5. Based on everything we have discussed so far, in your opinion, what should future research focus on? **[5min]**	- Probe: What are the top three aims to focus on and why? - What role will aquatic foods play, if at all, in addressing these challenges?
6. How can WorldFish better work with you and others in tackling these challenges? **[5min]**	- Probe: In what areas should we improve our research to have an impact? - How can we work better with partners and who should we be working more with?

Appendix D.

Stakeholder Selection Guide

Interviews to be conducted with up to 7 stakeholder groups. A guide for stakeholder selection was provided which included stakeholders which WorldFish work closely with, and those that are often given less attention (e.g. fisher associations), as well those with expertise on the new three impact areas of WorldFish future strategy: climate, socio-economics and nutrition. Stakeholders selected could be adjusted based on country-level priorities and needs. Up to 20 interviews was proposed to be conducted, in line with qualitative research design, with inclusion of women and men experts in country. Due to challenges from Covid-19 and resources, a minimum of 12 interviews was subsequently revised. As such, interviews represent a snapshot of perspectives from key country stakeholders, which can be built upon in the future.

Stakeholder Group	Full Study N=20	Minimum Requirement N=12
Fisher Associations and Working Groups	2	1
Private Sector	2	1
Government (nutrition, economic, climate, agriculture-food broadly)	4	4
NGOs local (nutrition, climate, poverty/socio-economic development)	2	1
International Institutions: - 3 from UN: WFP, IFAD, FAO. - 3 from CGIAR: IFPRI, IWMI, CCAFS (or other if none above)	6	3 (from UN)
Donors	2	1
Academia & Research (nutrition, climate, poverty/socio-economic development)	2	1

Appendix E.

Processed data from WorldFish interviews (example).

* Spelling and sentences are preserved as they are, directly from the interviews or taggers comments.

Country	Interview	Tag_Id	Tag	Justification	Text	Topic	Issue Type	Stakeholder	Question Type	Theme1	Theme2	Theme3	Theme4
Bangladesh	Bangladesh_BARC_Govt	0	Main Idea – Quality and safe fish food production seems a great challenge in Bangladesh aquaculture	– Due to lack of technical knowledge, most of the fish-farmers do not know how and at what extent to use the antibiotics, quality feed and aqu-drugs or medicines. Indiscriminate use of chemicals in fish farming activity, has made this sector vulnerable. Because general people are now very much aware of health aspects of farmed fish intake along with the use of hormones, antibiotics and chemicals in farming operations. However, some local businessmen to make their own profit are selling the drugs and chemicals and low quality feed to the fish farmers as a beneficial input materials for farming. In this case, they consider the ignorance or knowledge lacking of the farmers. So there is no alternative rather than capacity building and mass awareness of fish-farmers to ensure quality and safe fish production	Quality and safe fish food production is the biggest challenge I think. Therefore, from production to marketing we need to ensure the safe and quality fish food production.	food quality and safety, control of antibiotic usage and education	Challenge	Government		food quality and safety	capacity development	chemicals control	education and knowledge sharing

Bangladesh	Bangladesh_BARC_Govt	1	Main Idea – Lack of skilled manpower in quality assurance is also a challenge.	– As Bangladesh is already made their significant position in aquaculture production, we now need to think of more export facilities. To export, quality assurance is an important task which for which we are dependent on other countries due to lack of skilled manpower in quality assurance. We have labs, however, for skilled manpower shortage we are unable to run those labs for which we have to spend a lot of money to be done by other countries. So developing skilled manpower for quality assurance of aquatic food products is much needed to expand our export area of interest.	however, we have to send the samples to other countries for export purpose which is time consuming and expensive as well. Hence, we need to ensure the lab test in our country so that we can export more. So skilled manpower is a key challenge.	labour and skills quality assurance	Challenge	Government		food quality and safety, tests labs capacity building	training and knowledge	social welfare	economic and markets
Bangladesh	Bangladesh_BARC_Govt	2	Main Idea – To establish processing plant and storage facilities to avoid loss	– We know that aquatic foods are very much perishable item. Also we know that Bangladesh's aquaculture production is increasing very significantly. These increase amount of production will be of no use or cannot contribute in the economy until we cannot make sure that the increase production is processed and stored well. Establishing processing and storage plant can also open up the opportunities to export the aquatic foods and earn more. These are also needed to ensure the benefits of the fish- farmers.	Co-ordinated programme and joint research are needed to establish a processing plant and storage facilities as aquatic resources are very much perishable	processing and storage waste and loss	Solution	Government		value-chains	waste and loss	infrastructure and technology	storage capacity and production

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Appendix F.

Initial Design of the process

This appendix presents a detailed account of the initial design of the *OurStrategy* process that was planned as result of the consultations with managers and employees (7.3.2). Section 7.3.4 describes the associated system architecture and technological design.

The first stage (Designing).

An SC (comprised of a group of responsible WorldFish employees: country directors, headquarter managers, executive team members and lead scientists) who either initiated a formulation and consultation process or acting on their behalf need to gather (virtually or physically) and decide upon the following configuration:

- the way the *Conduct* stage will be organised
- the creation, alteration or reuse of the previously created supplementary documentation (instructions, guidelines, interview plans, schedules, explanatory and consent forms templates)
- the identification of topics, stakeholders to interview and interviewer's allocation.

These activities were aided by the following technology based on the available infrastructure. Group Chat Bot (MS Teams ChatBot) was used as a means for the topics and aims identification and capturing (logging) stage execution, as well as a communication layer for distribution of the scheduler, interview plan and other supplementary documentation, shown in Figure 37. OneDrive and MS cloud infrastructure was used for the storage of the produced documents and data.
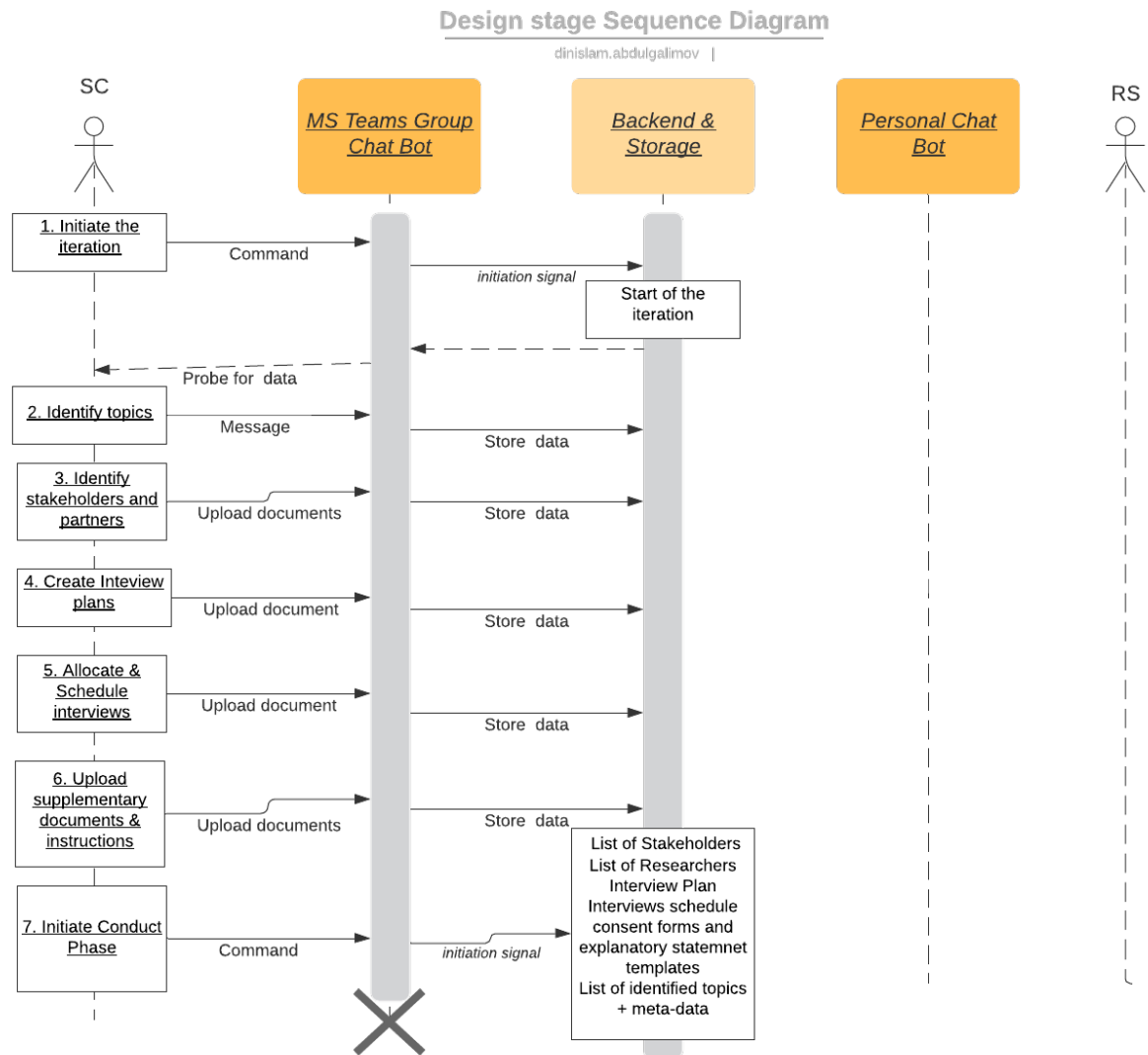
Figure 37. Design stage flow (based on existing infrastructure).

Documents such as an explanatory statement and consent form are important to establish a clear understanding from the stakeholders' perspective on what is expected and to remind conductors regarding the ethics of conducted activity since not all of them might be familiar with qualitative research (which is what this consultation process essentially is). At this point, a consent form is critical to inform the stakeholders about the risks and benefits of taking part in the consultation and requesting their permission to use the data produced through the workflow. It is usually collected in written form. However, due to the distributed nature of the study and potentially remote location of stakeholders, a more flexible digital alternative (in the form of the online form, based on existing organisational infrastructure) was suggested to supplant the informed consent step. The option of writing a document was left in case of face-to-face interaction.

The task of configuring the process, determining what topics to capture and how to organise the data capturing activities is often taken in an asynchronous and usually offline manner in both top-down and bottom-up approaches, per the context [1,20,224], due to it nuanced nature and necessity of quick and focused discussion. Similarly, it was planned that this stage would be conducted synchronously in a meeting or a workshop between SC members for the consultation process. The offline aspect was assumed to be optional due to the distribution of the participants (SC) across several countries.

The initial discussion between SC members is designed to be conducted through offline meetings or video call software (MS Teams in WorldFish's case). Due to the structural nature of the process and potential time limitations (including the first stage), the decision was made to introduce a Process Master (PM) to govern and manage the process. The SC members determined the PM at the beginning of the process (with different PMs for each iteration). In the Design stage, the PM would be responsible for initiating the new iteration cycle, facilitating the initial discussion and collecting data and documentation through the Digital Agent (MS Teams Bot) that was developed for aiding the Strategy formulation process.

The initial meeting during the Design stage requires determining the initial topics that can be configured through communication with the Digital Agent presented in Figure 37 via the MS Teams Group Chat. These documents and descriptions of the activities would later be distributed to all participants through the RS Digital Agent. Initial configuration happens through the chatbot by the PM or any of the SC members if it is configured as in Figure 38.
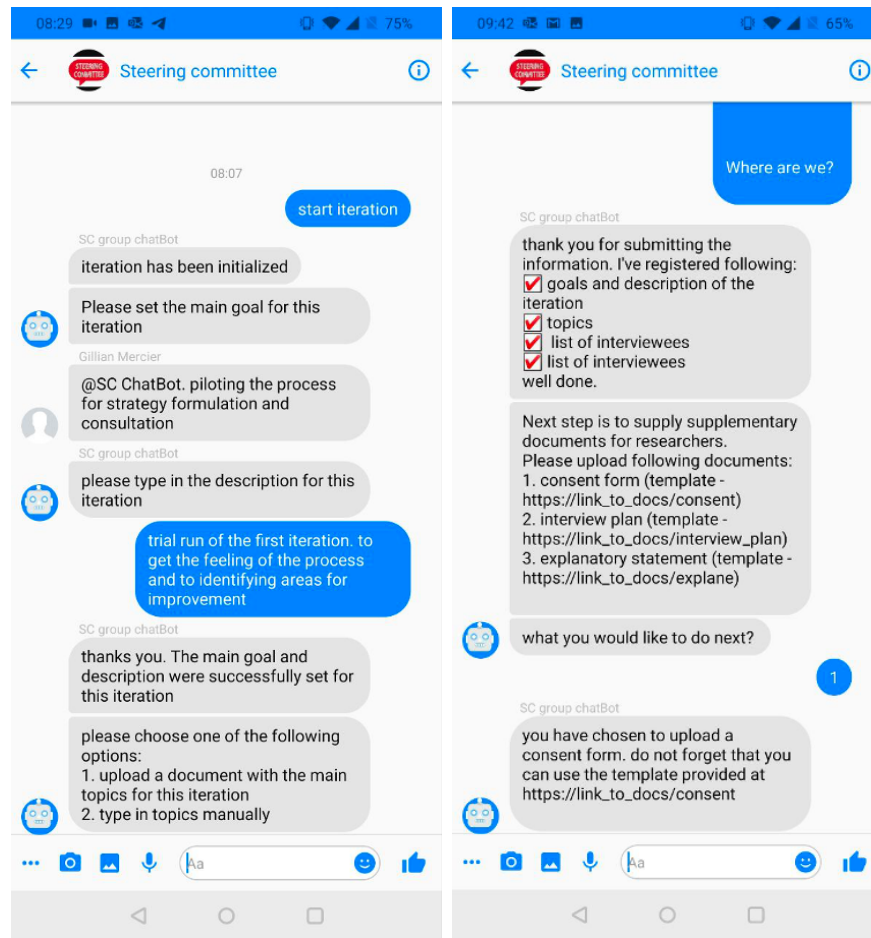
Figure 38. SC Digital agent chat example: a) initiation of iteration

b) creating documents from templates

Similar to Case Study 1, strategy formulation implies the participants are driving topic design and configuration. This creates shorter, more focused probe questions and bots dialogue design, as illustrated in Figure 38. For the WorldFish case study, digital agents were configured to facilitate the process that has interviews as the main activity within the Conduct stage. Thereby, all additional documents for this stage included interview questions, consent form, scheduler, brief and debrief. Due to the potential variation in topics and activities for each iteration, the focus of the design stage was shifted towards providing a minimum set of resources (in the form of templates) to support the subsequent stages, that could also be configured later before initiation.

At the start of the process, all SC members must be added to the 'SC' group in messenger (in this case, MS Teams). Then either the PM or any member (depending on how it is agreed) can initiate the start of the process and a first iteration. Figure 39 shows the MS Teams version.

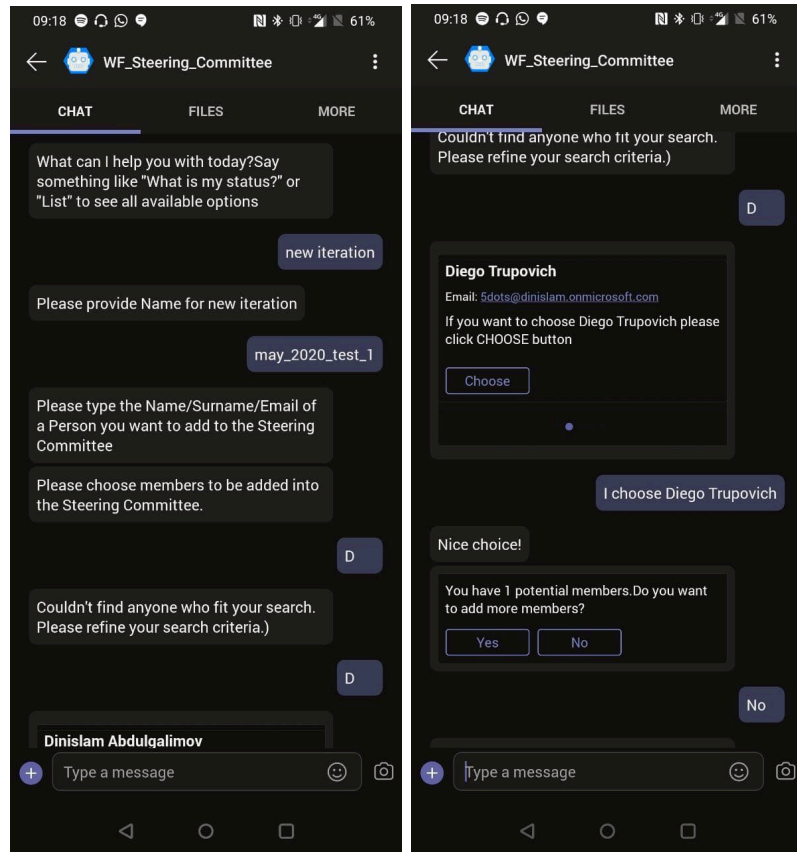**Figure 39. SC Digital Agent iteration initiation: a) creating new iteration b) adding steering committee members and uploading templates**

After the initiation of the design stage, all members receive an invitation to the SC chat (Design channel within the iteration Team in the MS Teams), as illustrated in Figure 40. At this point, they can start their discussion regarding the iterations activities and topics to address.
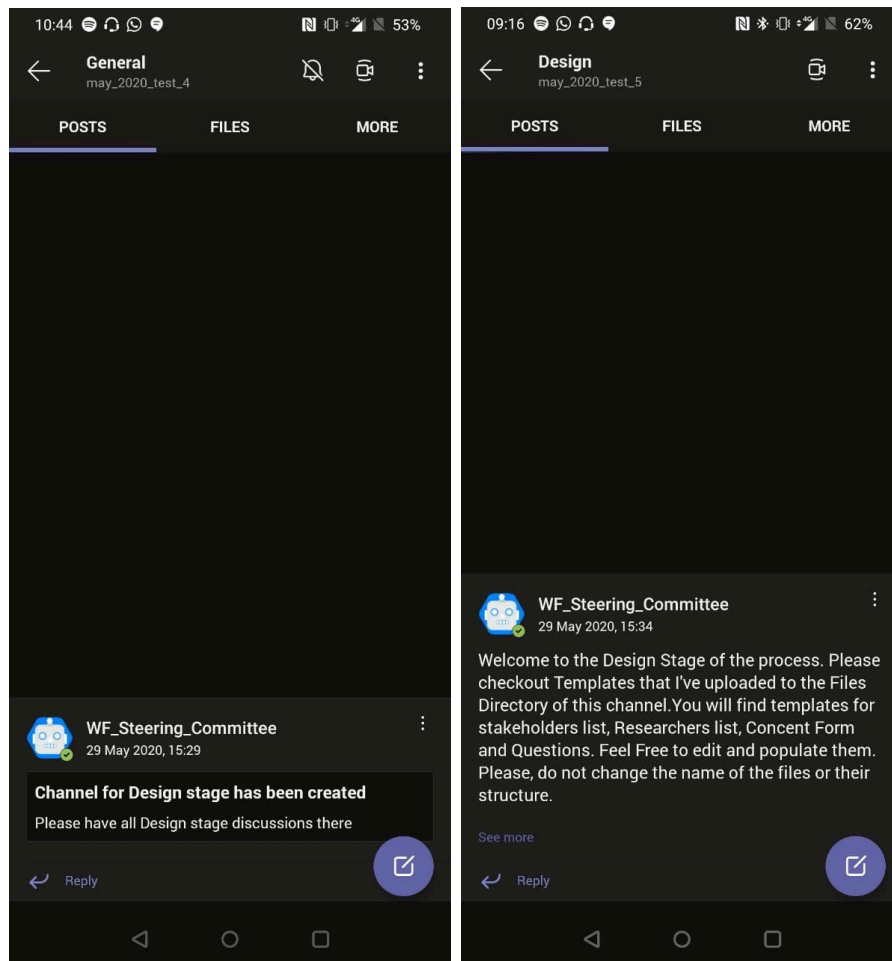
Figure 40. Invitation to design channel in MS Teams: a) message in the general channel b) seed message in Design Channel

Consequently, Digital Agent guides members of the SC through the steps of the Design stage in a Waterfall dialogue approach: that is, one step after another. As Figure 38 and Figure 39 show, there are two different methods employed. Either SC use generated templates to create all necessary documents, or they can type in answers and upload their documents that will be distributed later to participants of the conducting stage. In the first case, the SC Digital Agent needs to receive information about:

(i)   Topics by uploading a file or typing them all in one by one.

(ii)   Stakeholders (interviewees) by uploading the document with the list of proposed stakeholders for interviewing, as in Table 12.

(iii) Researchers (interviewers) by uploading a document with the list of proposed researchers for interviews, as in Table 13.

Table 12. Example of the table structure for uploading list of stakeholders.

#	Full name	Title, Position, area of interest/work	Relation to organisation	Contact information
1	….		Government partner	Tel: Email:

Table 13. Example of the table structure for uploading list of participants (activity conductors)

#	Full name	Title, Position, area of interest/work	Contact information
1	….		Tel: Email:

Additionally, all supplementary documents can be uploaded in a similar manner.

The key point in organising the stage like this was to make the whole process infrastructure agnostic and less prone to any accidents and technological collapses within the organisation. This is why two ways to initiate the design stage are supported. Depending on used storage and backend, organisational infrastructure powered by Microsoft products or anything else, uploaded documents can be edited through the most convenient tools for employees, accessed via the bot interaction or downloading using desktop and mobile office tools: in this case, the Microsoft Office 365 Online tools (Excel, Word, Project).

Finally, after the preparation and upload of all documents, the stage can be finished by parsing the pairs of interviewers and interviewees and distributing all necessary documents. At this point, the SC can either initiate the second stage (Conduct) or schedule training to talk through the process with activity conductors (employees). The closing of the design stage and agreement on questions was planned to be configured in two potential ways: either by the PM of the SC (or other chosen member) or as an agreed decision of all members through the poll.

Outputs produced from this stage are the list of stakeholders and conductors paired with each other, interview questions and plan, interview schedule, consent forms and explanatory statement, the list of identified topics, description of the iteration's main objective and some metadata regarding the communication of the SC members.

The second stage (Conducting).

This stage involves carrying out the substantive work agreed in the *Design* stage. Specifically, this means: *(i)* Conductors (employees) will hold the set of

interviews and prepare a preliminary summary and feedback from these interviews and *(ii)* the SC governs the process and manages the smooth execution, as depicted in Figure 41. If necessary, the SC is responsible for getting involved in resolving concerns and issues as they arise. Immediately after finishing their interviews, interviewers are asked to provide a summary in the form of the answers for three main questions: *(i)* indicate the main topics and respondent views regarding discussed themes (~140 words), *(ii)* note the topics for future investigation (~60 words) and *(iii)* provide reflections on interview process (~100 words).
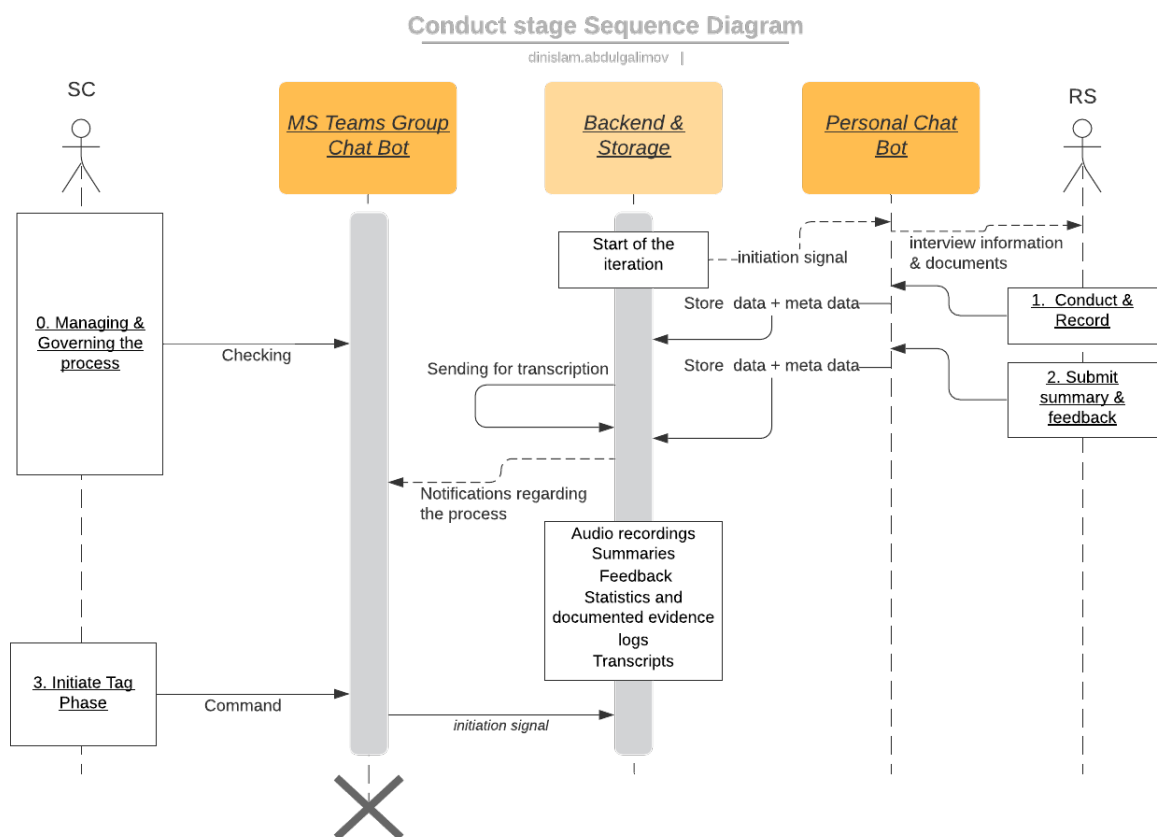
Figure 41. Conduct stage workflow diagram

As illustrated above, the SC members interact with the process through the SC Digital Agent while each conductor communicates with it through the RS Digital Agent. The SC communication is streamlined from one side (grouping them) and provides a personal touch and increased affordance for conductors from another [238].

This stage is aided by the Personal Chat Bot/ RS Digital Agent (MS Teams Bot and/or other IMs depending on ESN and digital tools used in an organisation).

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It is used for two-way communication with the researchers (interviewers) for stakeholders' allocation, uploading of audio recording, gathering feedback and summaries and additionally, as a layer for resolving issues, gathering statistics and automating the logging process. Additionally, it employs transcription services (either automated or manual) to speed up the preparation for the next stage (*Tagging*). In the WorldFish case, OneDrive and MS cloud infrastructure are used to store the produced documents and data. MS Cognitive Services is used for automated transcription, and Group Chat Bot/SC Digital Agent (MS Teams Bot) facilitates governance and management by the SC.

At this stage, information regarding the interviewees is distributed to corresponding researchers (employees who will conduct interviewers) through the RS Digital Agent. Similarly, employees can update the SC regarding the interviewing process by responding to the RS Digital Agent with a message with the corresponding status, shown in Figure 42: Interviewee reached, Interview time agreed, Interviewee unreachable, Time not agreed, Interview conducted, Request help (to ask for support from PM).

After that RS Digital Agent will ask the interviewer to submit back the reflection, summary and audio recording of the interview to send through to the transcription service, as in Figure 42. During this stage, the SC members are provided with the interview schedule and their statuses to check and monitor the progress of the Conduct stage. As with the previous step, two approaches of submitting the required data were designed to make it more flexible and address potential issues. Therefore, conductors can upload audio and their feedback with the summary either through the Digital Agent by answering the prompts in the dialogue or uploading it back to the specific location in the organisational cloud storage (OneDrive in this case).
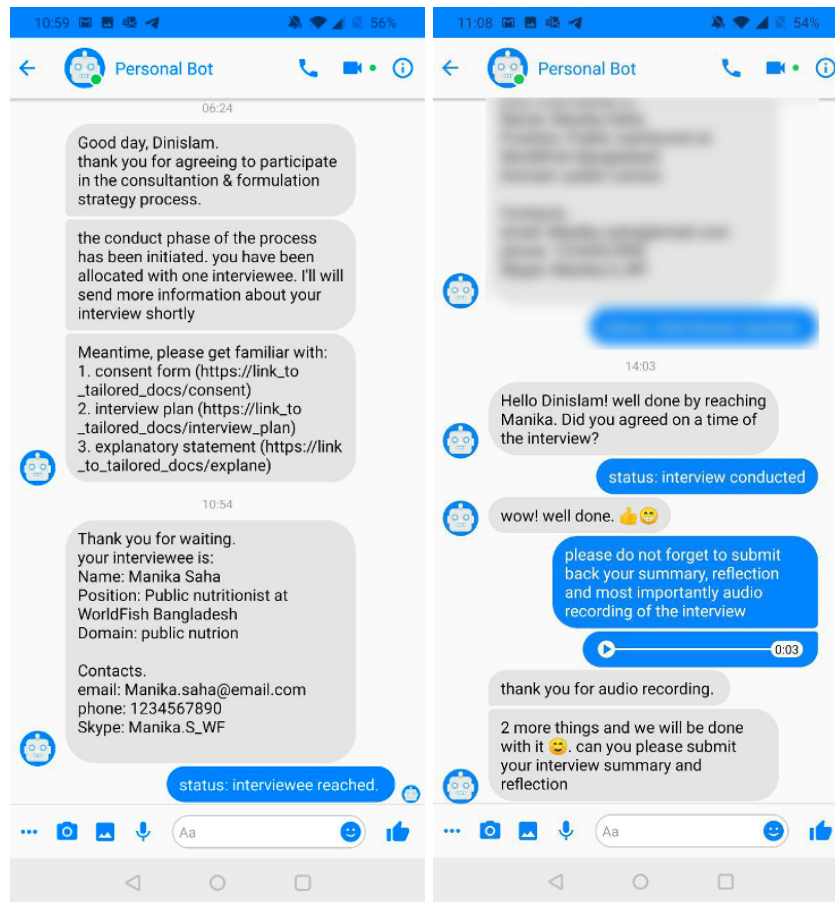
Figure 42. RS Digital Agent conduct stage facilitation: a) informing conductor on interviewee and date of interview b) requesting feedback after the interview

The outputs produced from this stage are the audio recording of the interview, transcript generated from the audio, submitted feedback and summary of the main findings of the activity (from the conductor's perspective), and the additional metadata regarding activity scheduling issues. The generation of the transcript will be discussed in more detail in subsection 7.3.4 on system architecture later in this chapter.

The third stage (Tagging).

Tagging is the stage of iteration where a more detailed analysis of the conducting activities is happening, based on the outcomes of the previous stage and the data produced. Unlike the following stage (Analysis), it is less rigorous and is distributed across the employees (interviewers). The requirement for participants is to accomplish a raw data analysis (in this case, transcripts of interviews). Still, unlike thematic content analysis, the idea is to identify broader themes and ideas that are not otherwise visible. The visibility aspect is determined

by the person who is doing the tagging. Thus, it distributes the workload and gathers additional employees' points of view by incorporating their 'subjective' opinions. I argue that in this scenario, where the focus of the process is incorporating employees' and partners' voices in the strategy, it is beneficial to 'process' the data through the lens of the employees and their peers to reflect their experience and understanding of the discussed issues. The researchers are allocated transcripts for tagging and summarising. The idea of such allocation is that they will need to analyse and summarise at least one interview. The exact allocation can be configured depending on which aspect of employee voice is addressed. Thus, to reflect and better understand the employee who has conducted the activity (direct and more personalised voice), this stage can be configured to allocate the outcomes to the exact employee (s) who participated in its production. To support horizontal and more homogeneous feedback, an employee who has engaged in conducting and an employee who analyses the result of specific engagement can be different people (from one office or even different offices and countries, to facilitate cross-validation). Consequently, with such an arrangement, each of the interviews will have two summaries from different employees, notes from the conducted and identified topics from the tagger. Eventually, tagging employees submit all produced tags and summaries back to the SC through the provided communication channel, shown in Figure 43.

This stage is aided by Personal Chat Bot/RS Digital Agent (MS Teams Bot and/or other IMs) as a tool for two-way communication with the researcher during the interview tagging process. As one of the options for additional flexibility, the researcher can submit tags back through the dialogue with the RS Digital Agent to receive a set of messages with an interview transcript and be asked to tag (provide keywords for a specific paragraph) it back, as in Figure 44, and to provide the overall summary of the interview to the interviewer as in the previous conduct stage, shown in Figure 42. Group Chat Bot / SC Digital Agent (MS Teams Bot) help to facilitate governance and management by the SC and OneDrive, and MS cloud infrastructure is used as storage for the produced documents and data.
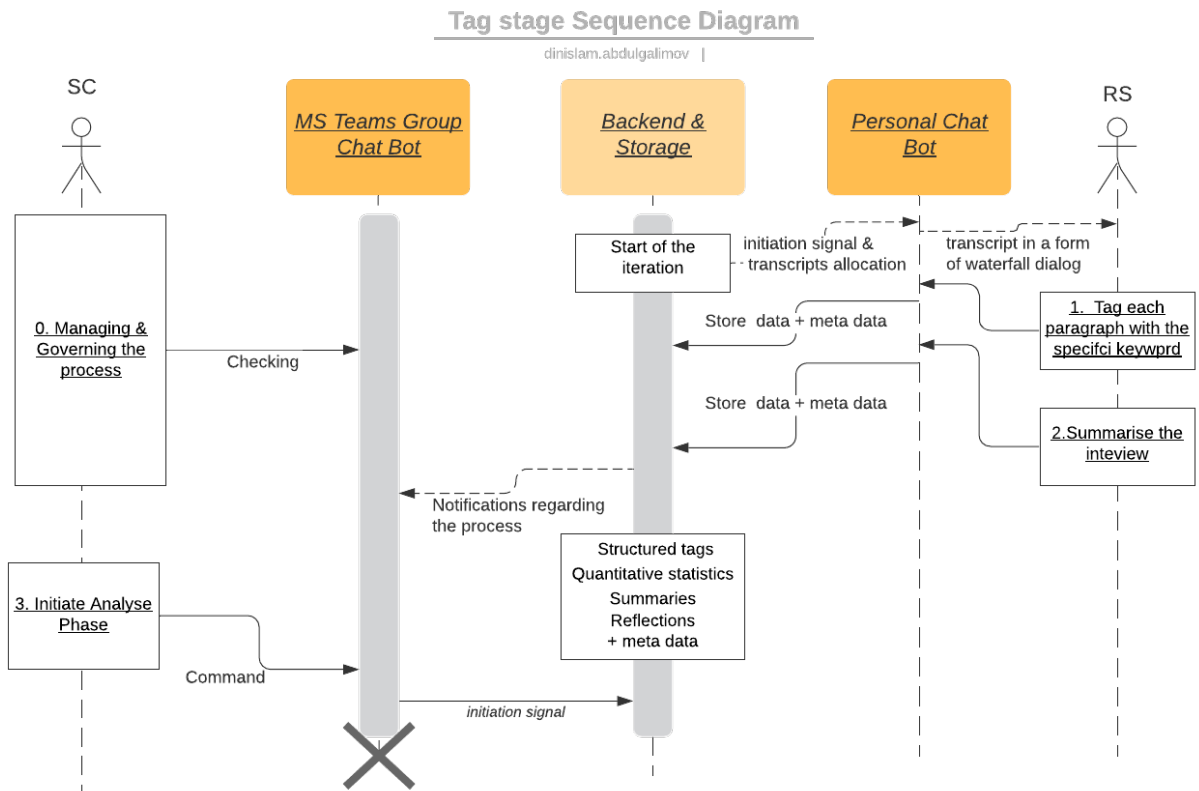
Figure 43. Tag stage workflow diagram

As previously mentioned, all collected transcripts of interviews are allocated to different employees at this stage, with the basic premise that employees will get a transcript of someone else's interview, preferably from an employee with a different domain of interest (based on the list of employees created at the Design stage).

The tagger (the employee who is tagging) will need to summarise the interview through interaction with the RS Digital Agent. As an alternative, for greater flexibility and achieving more technological independence, employees can always download the transcript as a Word file, work with it locally, and then upload back identified topics and summaries. This is facilitated through OneDrive and shared folders. After that, in the workflow case through the RS Digital Agent, once the tagger has become familiar with the transcript and the summary is submitted back, the system will change the specific activity and associated workflow status to 'awaiting tagging'.
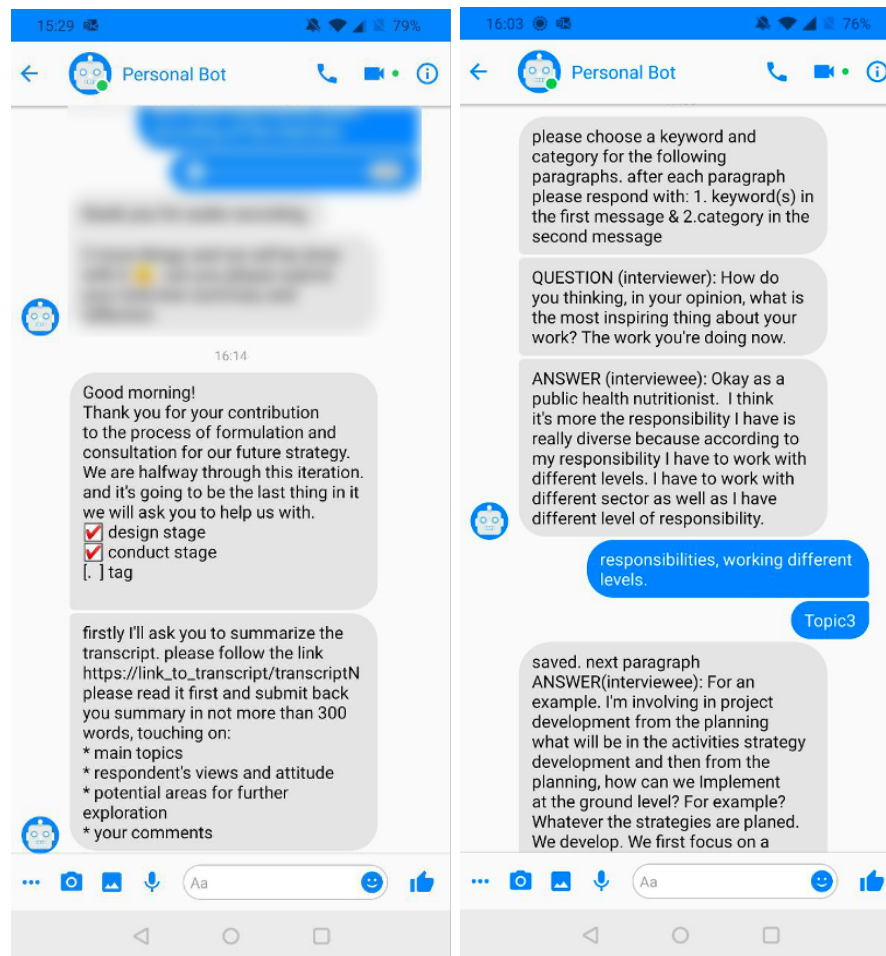
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Figure 44. RS Digital agent tag stage facilitation: a) requesting summary after the interview b) tagging process through the dialog

The Digital Agent will then prompt employees to start tagging. During the tagging process, the Digital Agent will post back to the tagger one paragraph of text at a time, asking them to submit back the main keyword(s) for this paragraph (essentially, to tag it), along with identifying this paragraph as one of the following: *Topic 1 (main), Topic 2, Topic 3, Topic 4, Topic for exploration, Controversial point, Other*. Similarly, step after step, taggers will go through the whole transcript, with the ability to get back to the full version of the transcript via the link provided. During this stage, the SC members will oversee the process and its execution/progress. The SC Digital Agent acts as the supplier for information and a reminder for any leftover bits.

The outputs produced at this stage are structured tags for each interview and identified topics, summaries and reflections, and the additional quantitative metadata regarding several identified topics and their distribution.

The fourth stage (Analysing)

The final stage of iteration involves the SC and relies on them to do most of their work. The OurStrategy system aggregates all the activities data (qualitative and quantitative) and supplementary statistics to present a decision on the main topics and ideas. Additionally, the SC needs to identify areas for further exploration to discuss and formulate this iteration's conclusion. That is, to decide upon further investigation and initiation of the next iteration or producing the final document and finalising the whole process as shown in Figure 45. Finally, according to the outcomes of the previous study, the crucial part of this stage is providing employees with a report or feedback regarding the finished iteration and its main outputs.
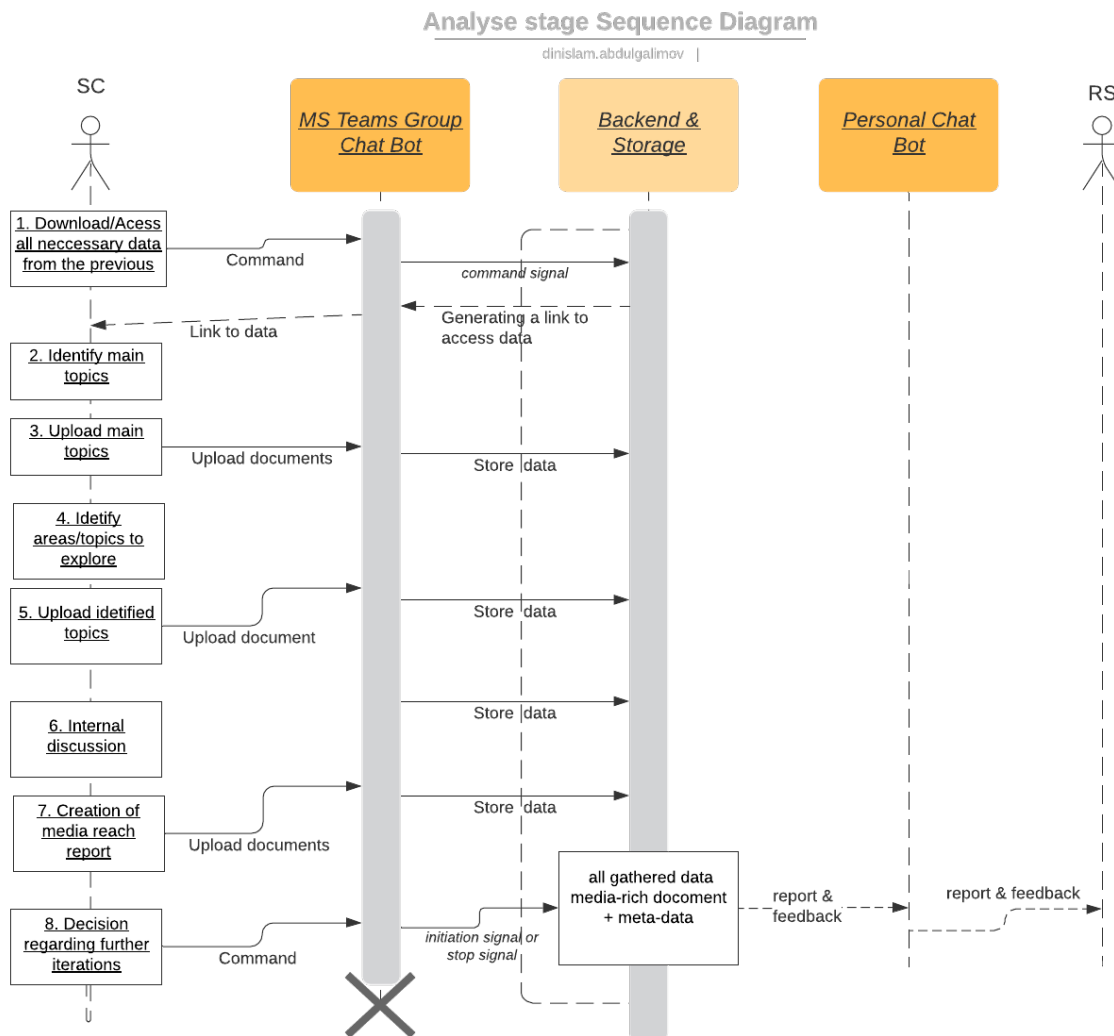

Figure 45.Analysis stage workflow diagram

The stage is aided by Group Chat Bot/SC Digital Agent (MS Teams Bot) as a tool for data aggregation and requesting of additional metadata and statistics about the iteration, and as a channel for submitting back to employees and stakeholders (if needed) the main outcomes of the iteration and the report. Personal Chat Bot/RS Digital Agent (MS Teams Bot and/or other IMs) are used to receive the report and feedback from the SC by employees. OneDrive and MS cloud infrastructure are used as storage for the produced documents and data.

As shown in Figure 45 this stage assumes a set of structured activities that helps SC members analyse the collected data, identify main topics, and upload them into the system (to track the progress of the whole process). Subsequently, the system facilitates themes identification and exploration of the areas for further research, as shown in Figure 46 through the supportive tools of Words Frequency Analysis and Natural Language Processing.
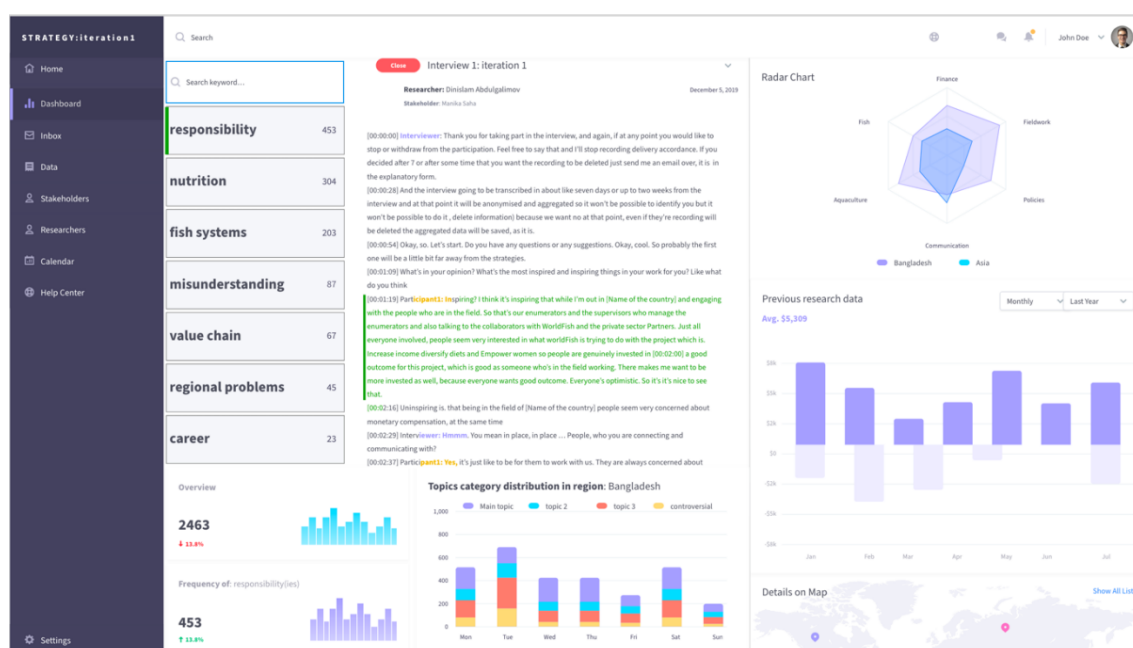

Figure 46. Analyse stage: Data representation interface

Moreover, all of this data can be accessed with the help of the bot, as demonstrated in Figure 47. Asking or choosing from the available options or through direct access to the storage (MS Office 365 Excel, Word) will ensure the availability of the collected data corpus outside the process.
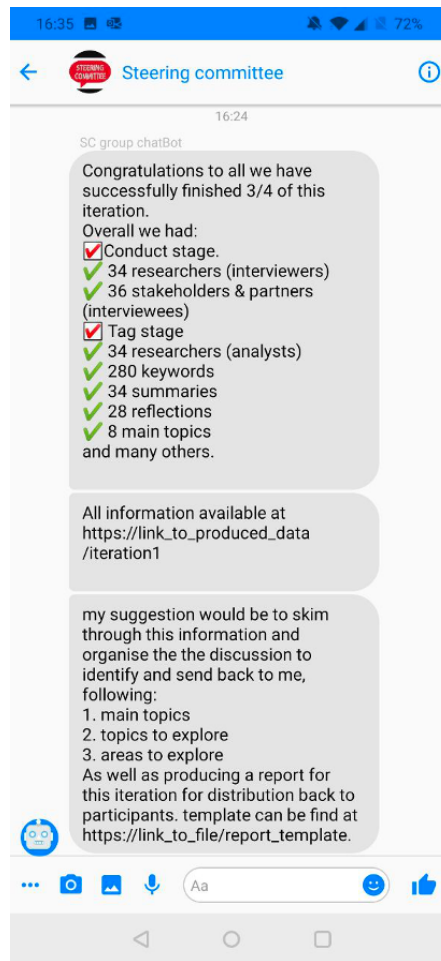
Figure 47. Analyse stage: finalizing the stage

Nevertheless, the primary focus of this stage is on SC members communication and sense-making that should result in *(i)* the media reach report that can be shared with the stakeholders and *(ii)* themes, topics and questions that can be used as inputs for further stages or to inform the strategy.

Thus, at the end of this stage, based on collected and uncollected data, time constraints, and other limitations, members of the SC must decide whether they want to continue to the next iteration or not. The report results from this stage can be distributed among stakeholders (as feedback regarding their work) and acts as an additional tool for sanitising/verifying conclusions or identifying potentially missed topics/areas.

Overall, the designed prototype was developed to be open and flexible enough to be used within the different contexts and incorporate different activities (specifically in the conducting stage). Although in the case of WorldFish, the prototype was tailored towards Microsoft Infrastructure and conducting

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interviews as the main activity, it can be easily adapted with the use of different messengers or other communication means (even purely manually without any automation). The same flexibility can be achieved with the activity during the conducting stage (in this case, interviews). The focus is mostly on the qualitative method and associated activity, rather than on the specific type (including focus groups, workshops, interviews and diaries, etc.).

Appendix G.

Country Specific Themes

This Appendix presents detailed account of the emerged country-specific themes during OurStrategy consultation process. Due to the high volume of collected data, not all views and insights related to each country are described here. However, more detailed, relevant aquaculture information may be published by WorldFish in due course.

Bangladesh.

In line with the cross-country results, stakeholders in Bangladesh emphasised the importance of focusing on the social and economic aspects of the research direction for WorldFish. Stakeholders also recommend tackling issues related to socio-economics of value-chains, production, technology development and necessity of innovations in the aquaculture sector, as demonstrated in Figure 48. Donors, academics and international institutes discuss climate change and shocks, while fisher associations and international institutes also focus on social justice, equity, governance and policies.
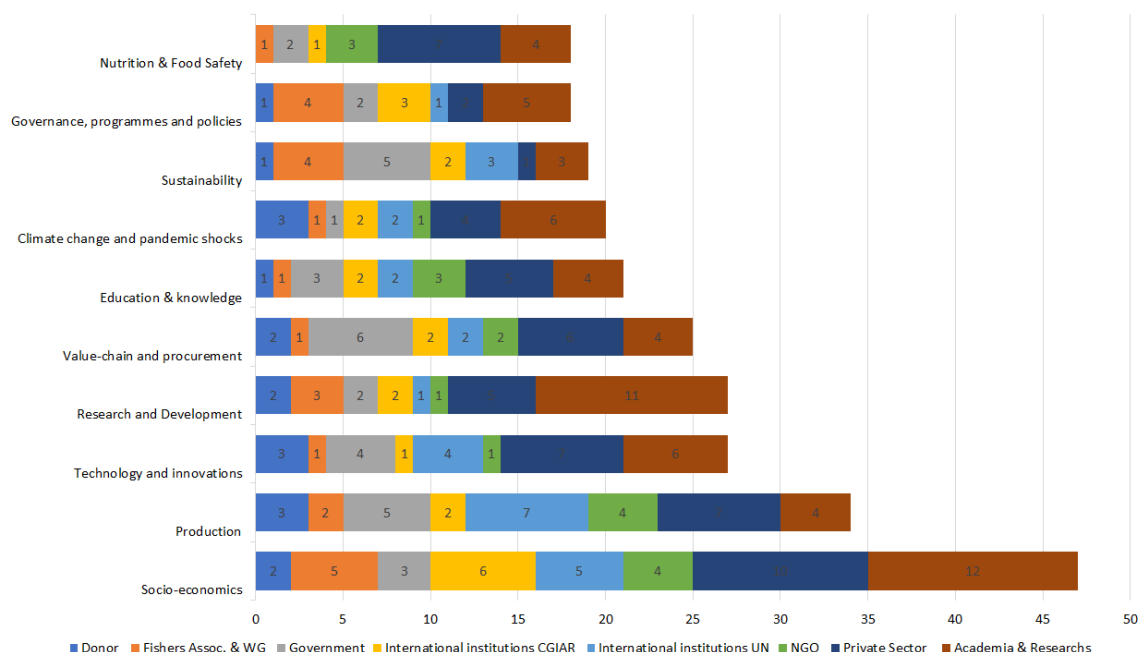

Figure 48. WorldFish OurStrategy: Meta themes distribution between different stakeholder groups in Bangladesh (Top10)

Discussions centred on whole-chain management (production to consumption), reducing fish waste and loss in value-chains while adding value to products for improving income. Solutions that emerged out of tagging and interviews included empowering the dry fish sector in the country and women specifically. Supporting the creation of additional value-added products (such as readymade fish foods and dried fish) and establish quality fish handling, processing and storage with corresponding market infrastructure, as was developing an exporting market for aquaculture.

> *Stakeholder (Bangladesh, academia and research): 'Quality and safe fish food production is the biggest challenge. Also, massive research is needed for value addition in based products and to re-think how we can motivate children and young people'.*

Production-wise, OurStrategy helped to emphasise that the conservation of freshwater aquatic ecosystems and inland fisheries had been neglected. Stakeholders suggested increasing attention to understand and combat existing threats (such as urbanisation, pollution, climate change, siltation and infrastructure development) that result in biodiversity loss. Thus, small-scale capture fisheries (inland and marine) are outlined and under-valued, leaving communities in specific regions vulnerable. At the same time, improvements in technology are required for waste and loss reduction and prevention of overfishing. Indeed, sustainability of production was also picked as an area of concern and future research and development by stakeholders. These issues are exemplified through the noted potential of mariculture and under-utilised areas in several countries, the concerns and actions of dealing with the unsustainable shrimp farming practices, water and land availability issues and poor-quality inputs at hatcheries and all-year-round production. Ultimately this led to the idea of focusing on diversification of the country's aquatic foods (such as the potential of seaweed), its sustainability and ability to support local communities from economic and health-related perspectives. Additionally, the development of related policies and supporting frameworks for small-scale fisheries is important.

India

Stakeholders' perspectives on future research and development priorities for WorldFish focused on tackling issues and challenges related to production, the socio-economics of value-chains, food safety and nutrition, as in Figure 49.
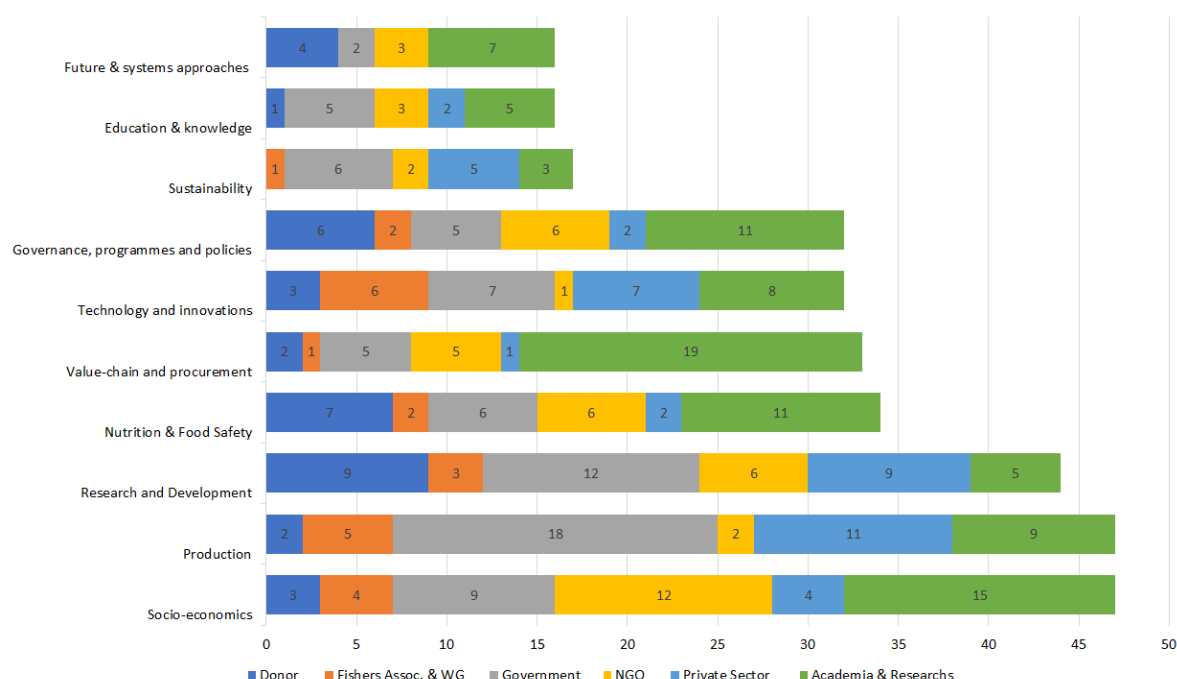
Figure 49.WorldFish OurStrategy: Meta themes distribution between different stakeholder groups in India (Top10)

The key challenge obstructing aquaculture from reaching greater potential in India's food system is the overall cost of production. The affordability of quality feed, development of local manufacturing, disease control, genetic improvements and diversity of indigenous species tailored to regions (such as polyculture and small indigenous species and rice-fish) were highlighted as priorities for aquaculture development and further WorldFish investigation.

> *Stakeholder (India, Fisher Association): 'We need to bring down cost of production in aquaculture'.*

Further, freshwater and marine cage-culture systems were highlighted as a sustainable solution to be focused on, including seaweed or bivalve culture. Seaweed farming specifically was defined as the sector with great potential in India, with opportunities for empowering women while requiring knowledge transfer from other countries ('leaders in the region') such as Indonesia.

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Additionally, stakeholders noted the potential and necessity of further research of inland water bodies stocking for capture fisheries concerning production.

Regarding socio-economic systems, approaches were called for to shift the focus from production to value-chains and consumption for nutrition. This suggestion was made to improve the local agency, social justice and equity for small-scale actors. More research is requested on how aquaculture-related food systems can be transformed to improve income, employment, food security, gender equality and reduce poverty to obtain more substantial data on how the wellbeing of fisher communities differs from to rest of society. As in Bangladesh, waste and loss tackling was particularly important for the capture fishery sector: cold storage capacity in the coastal states is not sufficient. A higher level of engagement of women and youth in value chains was stressed as a critical issue for improving the food security of local families and promoting diversification of fish-based products.

Stakeholder (India, Donor): 'Improve availability and accessibility of aquatic food for all would be a big boon in addressing nutritional challenges. Availability of hygienic fishes is a major challenge'.

Overall, there were some differences between the perspectives of different stakeholders. Governance, policies, food and nutrition security were emphasised by the donor and academic stakeholders. Technology and innovations in value-chains were of particular concern to fisher associations, government and the private sector, with the latter two also focusing more on necessary research and development.

Myanmar.

Unlike those in Bangladesh and India, stakeholders in Myanmar put more emphasis on tackling issues and challenges related to governance and policies, partnership and only then socio-economics being behind research and development and capacity development, as shown in Figure 50.
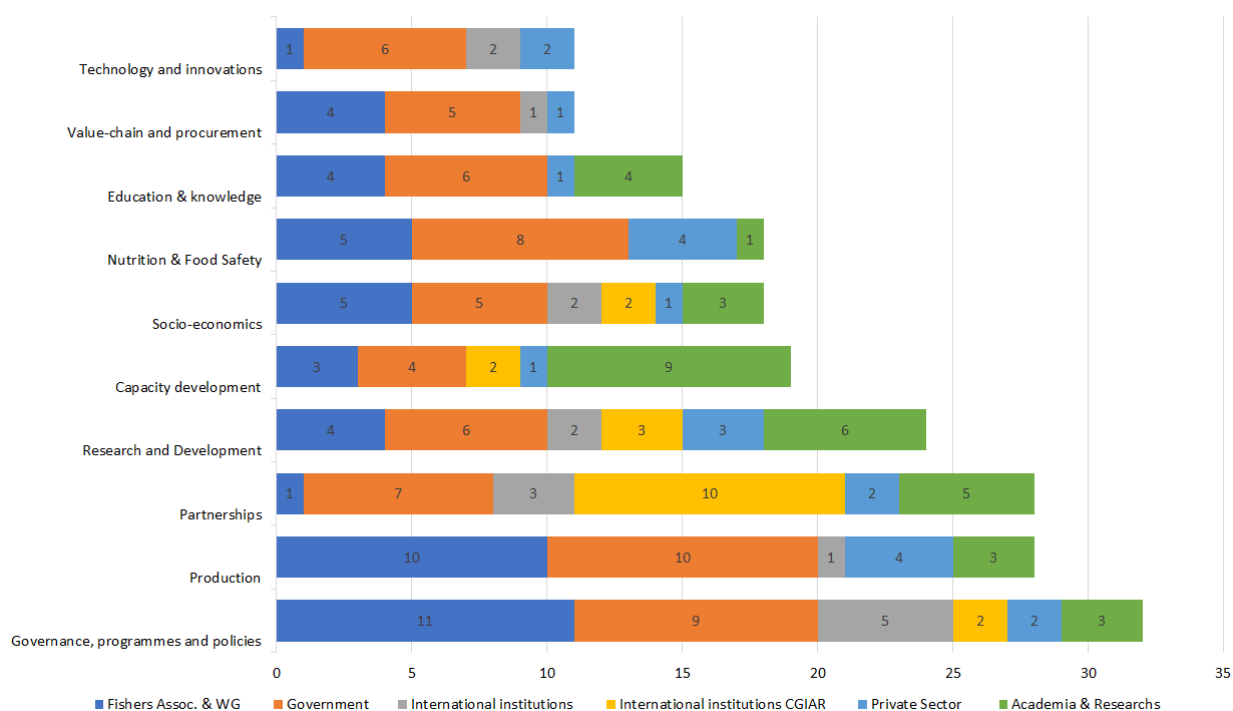
Figure 50. WorldFish OurStrategy: Meta themes distribution between different stakeholder groups in Myanmar (Top10)

Stakeholders urged for the transformation of land-use policies and called for better integration of aquaculture into climate-smart initiatives, agriculture governance, water management improvements (e.g., irrigation) and corresponding policies. As a result, a review of existing fisheries and aquaculture policy was called for to guarantee future sustainability and development of aquatic foods in the context of climate change across the region. Stakeholders from the fisher associations highlighted the necessity of support from authorities and institutions for fisher community associations, trade fares regarding prices and the re-evaluation of fisheries regulations (such as laws around inland fisheries). From this perspective, it will help to improve relevance and conservation, capture local knowledge, and focus on the bottom-up development needed in the country.

Stakeholder (Myanmar, Private Sector): 'There are fisheries laws and regulations for the management of aquaculture, inland fisheries and marine fisheries. However, no profound provisions for the conservation purposes has [been] described. Fisheries operators also take opportunities on the government policy to increase annual fisheries production. Such policy on the other hand indirectly weaken to the law enforcement. Illegal and irresponsible fishing has been expanding and the fishing pressures also increased. Determine by the landing volume seems the production is increased, but almost 30% of the catches are the

substandard quality. Aquaculture is the substitution of declining capture fisheries. However, land use policies and restriction of irrigated water utilisation constraints aquaculture development'.

In terms of the partnership, stakeholders outlined WorldFish as a key organisation to help enhance collaboration in the aquaculture sector. The partnership includes opportunities for cross-learning and capacity development through shared learning and resource management (such as water-land-fisheries), the establishment of effective partnerships across government divisions, universities or regions and between donors and other One CGIAR centres. Additionally, some non-traditional partnership suggestions were made, such as with the private sector, based on provisioned infrastructure, energy resources and planning.

> *Stakeholder (Myanmar, Fisher Association): 'We the village fishers and the managements have less capacity to tackle these challenges. Hence, we wish to work with WorldFish Guidance to implement the research as required'.*

Suggestions were made for more partnerships through participatory approaches with aquatic food actors and small-scale fishers to ensure effective empowerment of communities, their development and understanding of their needs. In line with the concerns around the sector's governance, stakeholders highlighted the benefits of a food systems approach in tackling multiple challenges and providing leadership to a multi-sectoral approach to formulate more progressive policies across different sectors. For future research and applied projects, the organisation requires more understanding of policy processes, their impact and knowledge aggregation pathways.

Overall, stakeholders from academia and international institutes focused more on capacity development and broader partnerships within and beyond the aquaculture sector. Fisher associations and government stakeholders highlighted improving governance and policies, production of aquatic foods, its safety and nutrition value. In contrast, the private sector and food nutrition centred on production and value-chain optimisation.

Nigeria

Nigeria's stakeholders focused on production strengthening, improvements in research and development, socio-economics of value-chains and addressing climate change and global shocks affecting aquaculture and the country in general, such as the COVID-19 pandemic. An overview is provided in Figure 51.
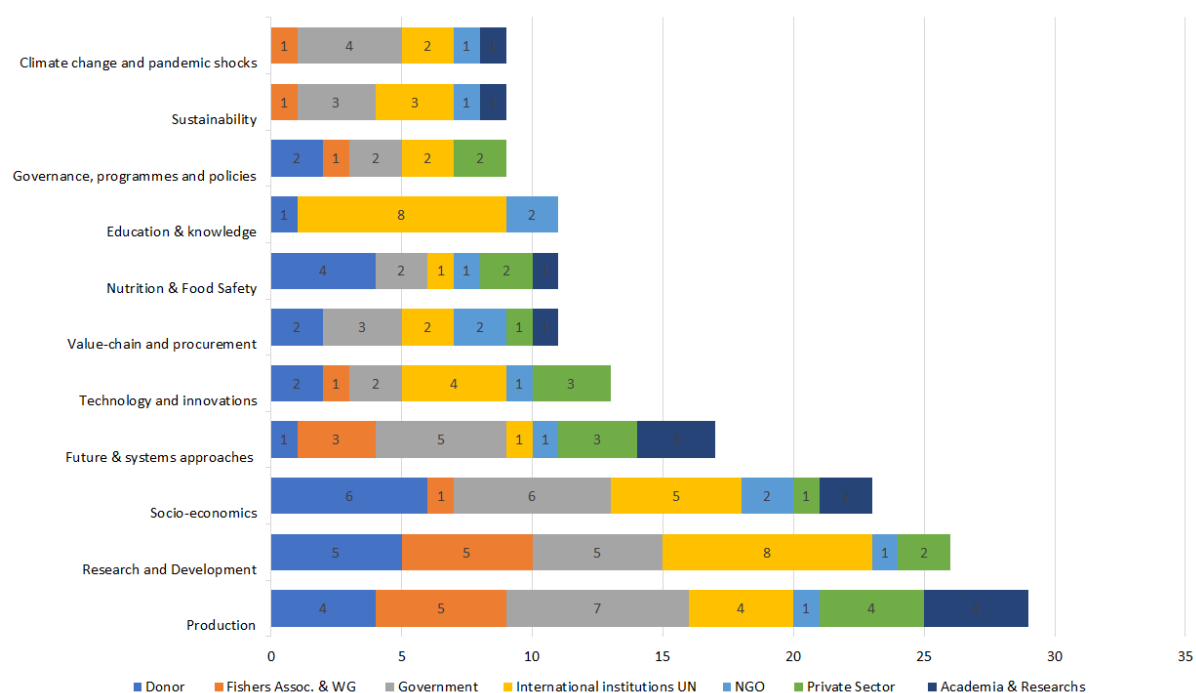
Figure 51. WorldFish OurStrategy: Meta themes distribution between different stakeholder groups in Nigeria (Top10)

Interviews revealed concerns around more research and development and investment needed in the aquaculture sector, mainly to benefit smallholders and provide them with access to financing and support schemes. More affordable inputs and technical services (such as genetics and health surveillance) were listed as essential areas for the multi-disciplinary focus of future WorldFish endeavours in Nigeria to promote diversified production systems for local fisheries.

> *Stakeholder (Nigeria, Fisher Association): 'Nigeria has not conducted stock assessments in their marine or inland waters. Without systematic studies, effective fisheries management could not be formulated'.*

Additionally, stakeholders discussed that innovations and models for aquatic food development researched by WorldFish lack visibility and need to be promoted to make their relevance for vulnerable communities more visible: for example, by

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improving fish consumption in schools and engaging with youth. Other stakeholders (particularly from the international institutes) highlighted opportunities for strengthening partnerships to work on aquatic foods for combatting malnutrition, showing the importance of a multi-disciplinary approach for addressing multi-faceted issues again. Similar to India and Bangladesh, value-chains were also outlined as very important for generating employment for women and youth, showing that further opportunities exist for engagement and reinforcement with youth, and distributing knowledge on solutions for the sector while improving women engagement and gender equality.

Overall, fisher associations focused on issues around aquaculture expansion (such as mariculture and genetic improvements), supporting capture fisheries, and developing climate-smart practices. Donor organisations centred on nutrition-sensitive product development, school feeding programmes, waste and loss reduction, gender equality and diversification of aquaculture. Conversely, future challenges and the development of practices that increase resilience and adaptation to climate change and shocks were of main concern for government stakeholders and diversification of aquatic food production to meet future demand in nutrition needs and food safety.

> *Stakeholder (Nigeria, government): 'Future fish supply is largely dependent on the adaptation to climate change impacts. The best practices should be developed'.*

Stakeholders from international institutes and NGOs emphasise scalability and increasing partnerships, including awareness of innovations, engagement with youth, conservation of the natural environment, development of local aquatic food production, ways to reduce reliance on imports and approaches for changing consumer behaviour towards more fish consumption (as the healthier alternative). These priorities support academics who suggest more research on the cost-effectiveness of aquaculture and nutrition benefits, along with reducing the impact of the shock. Finally, the private sector urged for research projects in technology innovations in production and value-chains.

Solomon Islands

Stakeholders on the Solomon Islands identified socio-economic across value-chains, sustainability, partnership technology and innovation and research as the most critical issues, summarised in Figure 52.
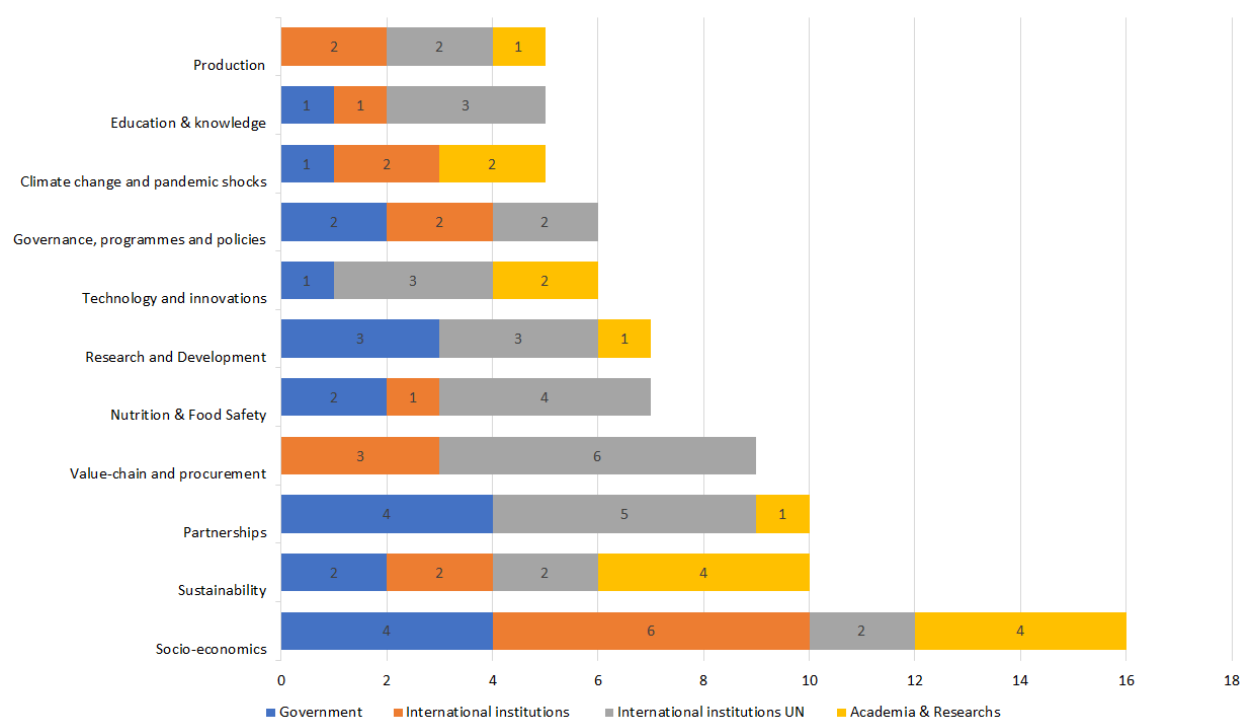
Figure 52. WorldFish OurStrategy: Meta themes distribution between different stakeholder groups in Solomon Islands (Top10)

Different sustainability-related issues were emphasised as a potential future focus for WorldFish. Livelihoods in marine conservation areas and conservation of critical habitats and biodiversity in marine and freshwater environments are presented as the suggested solutions that need to be looked at in more detail. Interviewees outlined the development of new and diversified aquatic foods, such as freshwater or deep-sea species and seaweed, which would help alleviate pressure from marine fisheries, provide alternative support for communities, and contribute to their food security.

> *Stakeholder ([the] Solomon Islands, international institute): 'Fish advocacy would benefit from knowledge-based evidence on different types of fish available as well as their nutrition composition. WorldFish to look into value addition of aquatic foods (e.g., seaweed)'.*

Additionally, the necessity of further impact and benefits at the community level was highlighted. That would help to move beyond the management of fishery activities only and build capacity through infrastructure development, which would increase access to markets, trade and services. In this regard, technology innovation was assessed as crucial to improving production and waste and loss reduction sustainability.

Further, closer partnerships with communities were suggested as the realisation strategy for helping international institutes and governments implement additional food safety and capacity building programmes effectively. Opportunities for partnerships with international institutes were also highlighted, such as working with UNICEF (nutrition and complementary feeding for children) and UNDP (promoting aquatic foods for improved livelihoods), linking with their work on renewable energy for solutions to processing aquatic foods and expanding conservation initiatives.

> *Stakeholder ([the] Solomon Islands, government): 'We are conserving sites, but what is the return to the communities? Sustaining livelihoods are one of the biggest challenge'.*

Some stakeholders focused mainly on socio-economic issues and opportunities to work on aquaculture sustainability, whereas stakeholders from government and international institutes also highlighted the importance of partnerships for research on aquatic food, value-chains, food safety and nutrition.

Zambia

Finally, Zambia stakeholders discussed socio-economics of production issues, emphasising fish trade, strengthening governance and policies to protect and enhance fisheries, improving education and knowledge on food safety and risk management and promoting diversification of aquatic food products consumption for nutrition improvements, as shown in Figure 53.
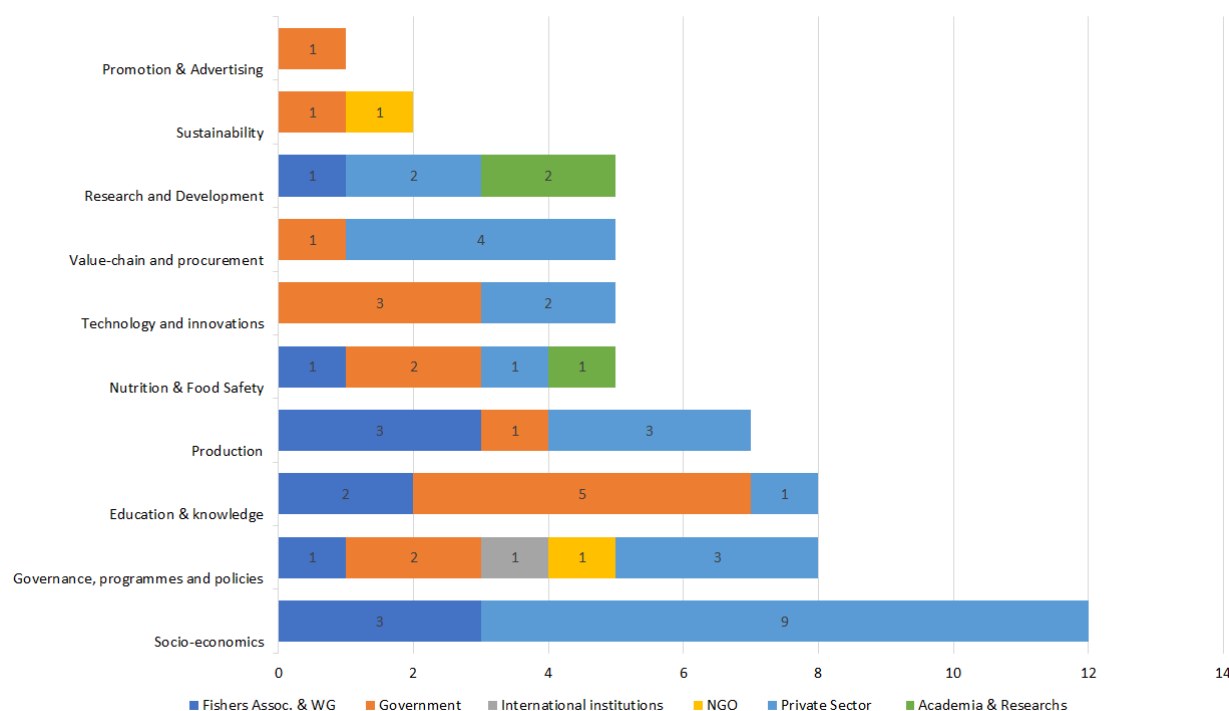
Figure 53. WorldFish OurStrategy: Meta themes distribution between different stakeholder groups in Zambia (Top10)

The aquaculture production cost was highlighted as the key challenge due to the high taxation of imported feed and lack of access to quality fingerlings and brood stock, especially in rural areas. A potential solution was suggested: to develop standards and locally running networks with a local source feed. Further, technological innovations such as knowledge transfer through mobile platforms were viewed as a possible way to overcome low-capacity development and lack of extension services in aquaculture and help address the educational aspect of aquatic food production. Another socio-economic challenge across value-chains is high transport costs and additional taxes that affect fish trade. Again, partnership with the government to develop standardised and transparent taxes was called for, along with the capacity building of fish traders to make trade and transport more accessible.

> *Stakeholder (Zambia, private sector): 'Transport costs are highly expensive in Zambia, and for the traders it is highly unaffordable. To develop market structures favourable to the smallholder, to reduce waste and loss'.*

As in other countries, the reduction of waste and loss was a highlighted priority. Generally, weak infrastructure and lack of market access were identified as the

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reasons for high waste, showing a need for more research and development efforts to promote more efficient processing (such as better storage technologies) and development of market structures for smallholders where fish traders can have access to the larger market.

A fragmented approach to natural resource management in Zambia was identified as the driving force for environmental degradation (such as deforestation, pollution) and the reason for the decline of aquatic ecosystems and capture fisheries problems. Stakeholders argued for an integrated, multidisciplinary approach to research, management, policies and work with the government across diverse fisheries, forestry, wildlife and tourism sectors. This approach is also linked to better education, knowledge and training distribution regarding food safety and understanding of the nutritional benefits of fish. Distribution of best practices around the food safety risks across value-chains, provisioning of training on risk management and for fish products, and increased education on the value of consuming fish to improve dietary diversity of vulnerable rural populations would all contribute positively.

> *Stakeholder (Zambia, government): 'To sensitise the communities, especially the rural communities, where they have water bodies and malnutrition. Engaging line ministries and agencies such as Ministry of Health, community development, CARE international etc., on designing campaigns'.*

Overall, the fisher association stakeholders focused on addressing the economic challenges of aquaculture and distributing knowledge on food safety. Private sector stakeholders were also concerned about socio-economic challenges of aquaculture production and across value-chains relating to fish trade, taxes, market access, waste and loss, and social welfare policies. Interviewees from the government centred on policies that strengthen the protection of aquaculture and fisheries specifically, including facilitation of innovation and technology usage and further research into better ways to provide education on nutrition to vulnerable populations. Stakeholders from an international institute, an NGO and an academic also agreed with the focus on the sector's governance. They suggested

further improvements to data monitoring, diversification of aquatic foods in the country and promotion of nutritional and health benefits of fish.

Appendix H

Design cycle Interview questions

Ethics – anonymity (masked during transcript)

Could see transcript later if have concerns (and withdraw)

- Introduction to Employee Voice (2 types)
  - Supporting Voice (e.g. improvements/suggestions)
    - Example when tried, or wanted to but did not voice
      - Can you describe the process you took to voice your [suggestion]?
        - Effective process? If not why.
      - What was the outcome of your [suggestion]?
        - Satisfied with outcome?
      - What recognition did you receive for your [suggestion]?
        - Adequate? Happy with it?
      - How did you feel throughout the process? Was it something that many people do in your organisation or were you the odd one out?
        - Did you feel secure?
      - Would you do it again? What could have been done differently?
    - If have not voiced support
      - Why not? (methods not available, fear of consequences, culture of organisation, etc.?)
      - Has there been a time when you wanted to voice something but did not go through with it?
  - Challenging Voice (e.g. raising issues)
    - Example of when tried, or wanted to but did not voice
      - Same questions as above
      - Where did you get support from (if any) during process?
    - If have not voiced challenges
      - Why not? (methods not available, fear of consequences, culture of organisation, etc.?)
  - Others?
    - What happens when others do
    - Imagine situation when you would feel awk
    - Personal or perception (pot. Of authority)?

- <u>Moving onto an Online Platform</u>
  - What would be the most appropriate (likely?) use?
  - What would be the most essential functions?
  - What would be the desired workflow (for both supportive and challenging voice)? Example when…

- o What would prevent you from using an online system for voicing if it was implemented in your organisation?
  - How about reservations?
  - How could these be minimised?
- o How important would anonymization be (if mentioned)?
  - What measures would need to be adopted for you to trust that your identity will be safe?
- o What would be the best way to register employees?
- o What would be the best way to authenticate employees in the future?
- o Moderation (if mentioned)
  - Ideally would the platform require a moderator.
    - Human/machine
    - Full time/rotating
- o Mobile or computer?
  - Web/Text/Voice

Appendix I.

Post-deployment interview questions.

Interview regarding the deployment with the sessional staff and potential follow-ups and steps and role of the system in it.

Pre-deployment steps	
1.How did you find the preliminary steps of the deployment	- convenience of the process - suitability for your case
2. What steps would you add or change?	- potential improvements - things to change / add / delete
System use and deployment	
3. How did you find the usage of the system?	- As a user - As a moderator - What do you think about engagement level?
4. What would you change in the system or its moderation?	- For future deployments, what would you like to change in terms of users' engagement?
Post-deployment steps	
5. Please describe how was the system incorporated in the process (at what stage, scale)?	- initial idea and your experience - based on your experience, would you use it differently, and if at what stage and how?
6. What outcomes and finding it produced	- did you find them useful and if did at what extend? - how they were used?
7. *(Based on the answers for the question 6)* What follow-up steps were initiated?	- Please describe the following steps. - How they progressed at what stage are they?

Appendix J.

Report Produced by Task and Finish Group Case Study 1 (Cycle 3)

MONASH University

INFORMATION
TECHNOLOGY

TASK AND FINISH GROUP

FINIDNGS
PROPOSAL
RECOMMENDATIONS

SEMESTER 1, 2020

2, JUNE 2020
VERSION 1.0

CONTENTS

OVERVIEW OF METHODOLOGY

The 'source artifact'

Prior to the Town Hall meeting for sessional TAs held on 8 April, a deployment of the OURVOICE.APP platform was used to obtain feedback on issues that TAs considered a high priority to be addressed. TAs were able to post concerns within the following categories:

- Wellbeing
- Training and Support
- Technologies
- Teaching Online
- Other

The collated feedback from this deployment formed our 'source artifact' for determining the issues and proposing solutions.

Scope of recommendations

On first review of the collated feedback received from TAs, we found that many concerns related to things such as HR matters which are centrally administered outside the faculty. We decided that we would limit our discussion to matters that could realistically be addressed within the faculty while paying consideration to the current environment.

Identifying root causes and sub-causes

Reviewing the source artifact further, we found that many concerns raised as pertinent under the current COVID-19 crisis were not so much symptoms of the COVID-19 crisis as exacerbations of existing root causes within the faculty. While some TA concerns were framed directly in the context of the COVID-19 crisis, other concerns spoke about longer term issues. We also felt that some of the concerns initially regarded as being 'out of the faculty's control,' such as concerns framed as HR issues, were in fact indirectly rooted in issues such as pedagogical delivery pressures which brought them back into scope for discussion.

The categorisations of root causes and sub-causes were the result of a Group brainstorming exercise after reviewing the source artifact, and these are tabled on the following page **(Table 1)**. These became targets which our solutions aimed to cover.

Proposing solutions

With the given list of root cause and sub-cause categories, the group aimed to come up with a limited set of possible solutions which would collectively cover as many of the cause and sub-cause categories as possible. In addition to these categories, solutions were grouped by possible implementation timeframe.

Group members (each bringing their own strengths and diverse opinions to the team) were asked to draft up short statements on their preferred solutions, to then re-engage TAs with as a way of validating which ideas might be suitable going forward. Group members were instructed to frame their solutions as attractive and workable proposals which would be viable to implement in a troubled economic climate as well as providing mutual benefits to the Faculty at large, not being one-sided to favour the needs of TAs in isolation.

Validating proposals

In the final step of our methodology, a new OURVOICE.APP deployment was launched and promoted through multiple email announcements.

This time, rather than asking TAs to contribute ideas from scratch, the platform was pre-populated with the proposal statements that had been drafted by members of the Group. TAs were invited to rate the proposals, make further comment, and suggest their own further proposals for future discussion. The latter are reproduced at the end of this report, but were not considered by the TFG due to the limited timeframe available.

The reception of each proposal among TAs, together with further remarks and recommendations, are in the **Validation, Resulting Remarks and Recommendations** section of this report on page 20.

ROOT CAUSES OF ISSUES IDENTIFIED BY TEACHING ASSOCIATES

Root cause categorisation	Sub-cause / issue	Addressed in proposal(s)
Ineffective Allocation of Existing Resources — An existing solution to an issue is already provided within the faculty but the expected benefits have not been realised	Communication Channels	2 3 13
	Training Sessions Depth	1 2 12 18
	Training Session Availability	1 2 12
	Training Session Specificity	1 2 12 18
	Delivery of Specialised Technical Support	13 14
	Training Material Accessibility	12 13
Pedagogical Stress — Pedagogical delivery pressures driving stress and/or unexpected workload requirements among TAs	Preparation of Teaching Materials	10 12 13 14 16 19
	Student Concerns and Anxiety	3 7 8 11 15 18 19 20
	Student Engagement and Academic Expectations	7 8 13 14 15 18 19 20
	Transition of in-Person materials to Online Materials	10 11 12 13
	Increased Marking Requirements due to Online Teaching	10 11
	Disparity Between Marking Requirements and Time Taken	
	Stress Regarding eExam Design	11 13
	Budgetary Concerns	12
Teaching Staff Wellbeing — Relates to TA concerns about inclusivity within the faculty, uncertainty among staff, and access to resources and facilities	Inclusivity and Accessibility	1 2 9 14 18
	Fostering Productive and Harmonious Work Environment	1 5 6 9 14 16 17 18
	Sessional Staff Facilities	4 6 9 17
	Sessional Staff Resources	4 5 6 7 14
	Empowering Sessional Staff	3 18
Job Security for TAs — Relates to TA concerns regarding career certainty	Alternative Opportunities for Sessional Staff	8 14 18
	Secondary Activities Outside of Semester	2 18
	Transparency Regarding Process for Hiring Sessional Staff	16
Information Dissemination — Problems arising where information has not reached those who required it	Central to Faculty	3 11 16
	Faculty to Unit	3 5 11 13 18
	Unit to TAs	5 11 13 18
	Faculty to TAs	1 2 5 15 16 18
	Student Uncertainty	8
	Transparency in Contingency Management	11
Technology/Infrastructure — Issues arising where the available IT infrastructure and support has not been sufficient for teaching or learning requirements	Internet Connection – Staff	5
	Internet Connection – Students	
	Moodle Support	
	Specialised Mandatory Software Student Access	14
	Availability of Specialised Technical Support	14

Table 1. *Root cause and sub-cause categories identified as mentioned in the Overview of Methodology, and referenced by each proposal suggested by the group.*

VARIOUS PROPOSAL STATEMENTS FROM GROUP MEMEBERS

The proposals that the Task and Finish Group came up with are presented on the following pages as they were written by various members of the Group.

The proposals statements are numbered from 1 to 20 for reference purposes elsewhere in this document.

Each team member brought different ideas for solutions to the table, and they were given the freedom to express these ideas in their own words by writing these brief statements; each addressing a subset of the root causes and issues outlined earlier.

These were later presented to the wider community of TAs within the faculty to gauge how the various proposals would be received by sessional staff and lecturers. The resulting feedback and findings from this exercise are presented at the end of this document.

TIMEFRAMES FOR IMPLEMENTATION

Short term

— Could be implemented within the current semester or is relevant to a transient situation.

Medium term

— Could be implemented next semester and may be of long-term value beyond the current situation

Long term

— Could be implemented next year and is of long-term value beyond the current situation

SHORT TERM PROPOSALS

1   DEDICATED NON-TEACHING TIME

ADDRESSES THE FOLLOWING ISSUES

Ineffective Allocation of Existing Resources	Training Sessions Depth
	Training Session Availability
	Training Session Specificity
Teaching Staff Wellbeing	Inclusivity and Accessibility
	Fostering Productive and Harmonious Work Environment
Information Dissemination	Faculty to TAs

DETAILED DESCRIPTION

The faculty should dedicate 1 hour/week as a non-teaching hour. No classes would be run during this hour. The time would be outside of standard business hours, as this is a more feasible time to implement zero teaching.

The faculty would endeavour to run all training, networking and social events meant for sessional staff during this hour.

This is not an entirely new concept for the faculty. In the past, the faculty had a whole day where no teaching happened. While that model is clearly not realistic these days, something like "Every Wednesday from 6pm-7pm there will be no classes" is entirely doable.

The exact amount of time and frequency of this non-teaching block is not set in stone. The point is for the faculty to have a regular block of time dedicated to sessional training, development and networking.

This would allow tutors with a high workload to attend events more regularly. Additionally, with events running outside of standard business hours, the faculty would not be pressured into running short events to keep in sync with the teaching schedule. More accessible events would also result in a more informed teaching cohort and less time spent by the FLEX and Workforce team answering questions they have already addressed.

2   TRAINING AND NETWORKING DURING SEMESTER BREAKS

ADDRESSES THE FOLLOWING ISSUES

Ineffective Allocation of Existing Resources	Communication Channels
	Training Sessions Depth
	Training Session Availability
	Training Session Specificity
Teaching Staff Wellbeing	Inclusivity and Accessibility
Job Security for TAs	Secondary Activities Outside of Semester
Information Dissemination	Faculty to TAs

DETAILED DESCRIPTION

The faculty runs a number of very valuable and informative training and networking events. The plan here is for some of them to run during the semester break.

This would allow tutors with a high workload to attend more easily. Additionally, as these events are paid, it would mean that tutors have the opportunity to get some sort of pay between semesters.

During the semester, these events usually run for 1-2 hours. Since these events would run out of the semester, it would be easier to coordinate 2-3 hour sessions. This would allow for more in-depth sessions, with more time for Q&A, discussion, and in-depth teaching.

3 SPECIAL CONSIDERATION REQUESTS DECISION-MAKING AT THE UNIT LEVEL

ADDRESSES THE FOLLOWING ISSUES

Ineffective Allocation of Existing Resources	Communication Channels
Pedagogical Stress	Student Concerns and Anxiety
Teaching Staff Wellbeing	Empowering Sessional Staff
Information Dissemination	Central to Faculty
	Faculty to Unit

DETAILED DESCRIPTION

Many units are still receiving special consideration requests from students directly, despite a recent change in policy. In these cases, students are referred to Central. Central forwards the request to the unit's lecturer or admin tutor and usually ends up requesting that the decision be made at the unit level anyway.

This is usually a workable, if tedious solution. The problem comes when students lodge their applications at the unit level in the last few hours before the deadline. By the time the student gets a response, their assignment will be late by a day or two (more if the assessment was due Friday night).

In these cases, it would be useful if the faculty gave units some clear guidelines about what they can do in these cases.

For example, if we could tell students that they still need to submit their requests through central, but we could tell them what the result would be and that they can act based on that knowledge.

Alternatively, the faculty could make a unified policy that special consideration requests submitted last minute are not expected to receive a prompt response. We could then communicate this to students at the start of semester, secure in the knowledge that the students are all receiving the same message.

The reason a solution like this is needed for extremely stressful situations for students where immediate compassionate discretion is required. In these cases, many tutors and admin tutors feel handicapped by bureaucratic processes and the need to tell students to comply with the new regulations. The proposed solutions do not require that Central changes their policies. All that is necessary is for them to communicate to the Faculty and to units what their decision-making process is, so that units can communicate this information to students.

4 ALLOW TAs TO OBTAIN **FAVOURABLE PRICES** ON NECESSARY RESOURCES, BY USING THE FACULTY'S EXISTING BUYING POWER TO NEGOTIATE SUCH REDUCED PRICES FROM VENDORS.

ADDRESSES THE FOLLOWING ISSUES

Teaching Staff Wellbeing	Sessional Staff Facilities
	Sessional Staff Resources

DETAILED DESCRIPTION

In undertaking teaching activities from a home environment, teaching staff members may not always find themselves in an appropriate working environment, and hence failing to meet good OH&S practices.

Therefore it is proposed that the University could assist the teaching staff in acquiring furniture, computing equipment so they can provide themselves with an appropriate and effective office/working environment at home. This could be achieved by the University/Faculty using its high volume purchasing power to negotiate favourable prices for its teaching staff from vendors.

5   SUPPORT FOR TUTOR INTERNET ISSUES

ADDRESSES THE FOLLOWING ISSUES

Teaching Staff Wellbeing	Fostering Productive and Harmonious Work Environment
	Sessional Staff Resources
Information Dissemination	Faculty to Unit
	Unit to TAs
	Faculty to TAs
Technology/Infrastructure	Internet Connection – Staff

DETAILED DESCRIPTION

When sessional staff are working from home they may face issues in connecting to the internet. This can be because they are sharing the internet with flatmates, don't have powerful broadband connections to home etc. This issue will exist even after COVID-19 because staff will still need to conduct some tasks at home.

Students might face the same issue but understandably tutor internet connection has to be seamless to deliver content to students

If the faculty can provide sessional staff who require them with Mobile Data dongles, etc. that would help them to complete their teaching tasks without stressing about the connectivity issues. Rather than taking this off the unit budget, it will be much easier for faculty (in terms of processing requests) as well as for staff if the Faculty can provide this support directly to the TAs who require it for their work.

Also if such support already exists, then this information should be more effectively disseminated to the teaching staff.

6   ADDRESS TUTOR WORKSPACE ISSUES

ADDRESSES THE FOLLOWING ISSUES

Teaching Staff Wellbeing	Fostering Productive and Harmonious Work Environment
	Sessional Staff Facilities
	Sessional Staff Resources

DETAILED DESCRIPTION

Some sessional staff do not have space/facilities to teach from home. This can be due to shared apartments, kids at home, etc. For such tutors it would be good if the faculty can provide some dedicated online teaching rooms. We understand that not everyone who is living far from campus will want to travel to campus. But this solution will focus on many people who are living close to uni and are happy to travel if they can teach in a quiet and spacious room.

When sessional staff have breaks in between classes, currently there is only one (staff) room in Caulfield campus for sessional staff and the situation is the same in Clayton campus. This room gets filled up during assignment marking times and during basically any busy hours in the day

So, it will be good if more spacious and equipped rooms can be provided for sessional staff. These rooms should ideally contain resources such as computers and printers that would help the TAs to perform a better job at teaching.

7 DEVELOP MANDATORY TAILOR-DESIGNED 'ONLINE LEARNING' TRAINING MODULES TO BOOST STUDENTS' ENGAGEMENT AND ONLINE LEARNING JOURNEY

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	Student Concerns and Anxiety
	Student Engagement and Academic Expectations
Teaching Staff Wellbeing	Sessional Staff Resources

DETAILED DESCRIPTION

Data collected from OURVOICE.APP and students' responses to Monash University's move to on-line education so far has presented a strong need for students to apply specific new learning strategies, and undertake subsequent actions to fully transit from traditional class-room learning to on-line learning.

This could have a profound impact on not only how they operate to succeed during student academic management life cycle, but also how they maximize their learning experience via formalising self-learning techniques and in group learning settings, and ultimately extend their capabilities for better marketability with potential employers during economic downturn.

FIT#2 Network Meeting scheduled on 14th May themed 'Challenging Students Behaviours' is a classic showcase where 100+ educators reflected the online teaching challenges. This could significantly affect students' own well-being, learning progress, interactions with other students and educators' teaching practice.

Considering the above analysis findings, students could benefit immensely from "*online learning*" training modules, and systematically learn what they are expected for on-line learning at undergraduate and post graduate level incorporating research methods concepts for AQF6-9 levels.

The solution is through a partnership with MEA education experts to review the existing online learning training modules via MEA Platform, enhance the training module contents by incorporating the needs as described and roll it out to all enrolled students as mandatory "on-board" training.

The training can be rolled out in staged approaches. Stage 1 for existing enrolled in-semester students who need to complete the training during the semester 1 break. Stage 2 for freshmen who need to complete the training by the first week of a new term. Upon completing the training, students are required to provide insightful feedback via a survey and rate the training, which could allow the training module to be updated responsively for future use.

8 CREATE A DEDICATED STUDENTS' ONLINE **LEARNING AND EXPERIENCE** FEEDBACK INBOX AT EACH FIT UNIT LEVEL TO **CAPTURE STUDENTS' VOICES**

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	Student Concerns and Anxiety
	Student Engagement and Academic Expectations
Job Security for TAs	Alternative Opportunities for Sessional Staff

Information Dissemination	Student Uncertainty

DETAILED DESCRIPTION

Away from Moodle Forum, to support fast feedback loops with students, the faculty establishes 'Student Online Learning and Experience Feedback' Inbox. This solution would allow students to anonymously voice their concerns in relation to on-line learning and teaching, and suggestions to improve their on-line learning experience in a designated faculty unit level inbox.

Tutors in each unit take turns to monitor the inbox, collect the feedback, respond to students after addressing them in unit tutor weekly meetings with consensus. Key finding at each unit can be consolidated and the data will be used to deploy quick actionable initiatives to address faculty level students' emerging needs.

9   CULTURAL SHIFT REGARDING STAFF ROOMS IN CAULFIELD.

ADDRESSES THE FOLLOWING ISSUES

Teaching Staff Wellbeing	Inclusivity and Accessibility
	Fostering Productive and Harmonious Work Environment
	Sessional Staff Facilities

DETAILED DESCRIPTION

This proposal relates to the issue of sessional TAs often feeling uncomfortable or being made to feel unwelcome when making use of staff amenities in campus buildings.

Inclusive leaders embrace, value, and provide a sense of belonging to all people. Diversity and inclusion in the workplace cause all employees to feel accepted and valued. Our Faculty will surely gain a lot by establishing a culture where sessionals are fully welcomed and included. Sessionals are part of Monash University Staff regardless of their employment status being "casual".

Sessional TAs bear one of the heaviest teaching workloads by dedicating long hours and yet they are almost invisible. Current facilities within our faculty such as kitchen or staff lounge areas are pretty much represented as if they are just for full time faculty staff members and postgraduate students. Sessional TAs shall be understood to have access to them as well. Those facilities are vital for TAs during the course of their daily teaching in all teaching periods. Building awareness among the faculty members may in turn facilitate TAs' well deserved recognition and inclusion. The shift in culture may require our school Manager even HR to be included in this process.

10   (RE)DEVELOPMENT OF EDUCATIONAL MATERIAL FOR ONLINE LEARNING

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	Preparation of Teaching Materials
	Transition of in-Person materials to Online Materials
	Increased Marking Requirements due to Online Teaching

DETAILED DESCRIPTION

In the immediate aftermath of the imposition of various restrictions to normal campus activities at Monash University, all in-class/campus learning activities were converted to online activities. This necessitated that learning material (lectures and tutorial contents) be hastily adapted for online (teleconference/Zoom) delivery. It is felt that while this was the right option,

as it was inevitable due to urgency, it may have led to a decline in the quality of the educational experience faced by students and teaching staff. This is likely due to the fact that learning activities and learning material originally designed for an in-class environment are not optimised for an online environment.

Going forward it is felt that to maintain a competitive edge, the Faculty (and University) is in a unique position to capitalise on the momentum set towards increased online learning activities. Most of the current Teaching Staff will now have a much better understanding of the limitations of online delivery, but would have also developed strategies to overcome them. It is therefore proposed that the Faculty initiates actions to support the redesign of educational material specifically for online delivery by the current teaching staff. This will require providing additional resources (time/office space/additional staff if needed/dedicated content designers) to undertake this task at the unit level.

Current learning material, consisting mostly of tutorial and workshop material were designed for typical in-class environment delivery. In redesigning the material for online delivery, the aim will be to:

1. Maximise the educational impact of the on-line session by:
    a. Intensifying consultation and feedback provision by the teaching staff to the student during online interaction (individual or in small group)
    b. Promoting opportunities for student to undertake self-directed and independent learning activities in their own time
    c. Increasing the use and importance of smaller assessed tasks to be completed by the student in their own time
    d. Increasing the opportunities for students to engage in peer-to-peer learning activities online whether formally organised or incidental
    e. Reducing the dependence on time-table constrained activities for the student where possible, but instead allowing students to undertake equivalent activities in their own time.
    f. Encouraging and rewarding practices both from teaching staff and students that result in more engagement and innovation in learning
2. Review all summative assessment tasks/exams in relation to above, aiming at:
    g. Reducing dependence on typical invigilated exam activities
    h. Possibly reviewing exam scheduling, possibly to provide more flexibility for students to undertake exams at a time more convenient to them.
    i. The above also requires a thorough review of the importance of exams in the overall assessment of a student performance and ability to satisfy the Faculty requirements to qualify for their degree.

11 PRODUCTION OF AN **eEXAM READINESS MANUAL**

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	Student Concerns and Anxiety
	Transition of in-Person materials to Online Materials
	Increased Marking Requirements due to Online Teaching
	Stress Regarding eExam Design
Information Dissemination	Central to Faculty
	Faculty to Unit
	Unit to TAs
	Transparency in Contingency Management
[Other]	Student Special Needs

DETAILED DESCRIPTION

It is proposed that the Faculty develops documentation for teaching staff on eExams aiming to:

1. Provide clear guidelines/instructions of developing exam content in the appropriate form
2. Provide clear guidelines/instructions on marking of and processing of marks from student exam submissions/responses.
3. Provide advice on the security measures in relation to eExams
4. Clearly specifying access to supporting resources (staff, tools, technical support) available to teaching staff in relation to eXams.
5. Provide an overview of the basic technology underpinning the eExam infrastructure (to assist staff in resolving simple issues by themselves where possible.)

In addition to the current Exam submission checklist, the manual to also include

1. Pre-assessment checklist
2. Special needs instructions

MEDIUM TERM PROPOSALS

12 USE **MEA BUDGET** FOR ONLINE DEVELOPMENT TRAINING

ADDRESSES THE FOLLOWING ISSUES

Ineffective Allocation of Existing Resources	Training Sessions Depth
	Training Session Availability
	Training Session Specificity
	Training Material Accessibility
Pedagogical Stress	Preparation of Teaching Materials
	Transition of in-Person materials to Online Materials
	Budgetary Concerns

DETAILED DESCRIPTION

The budget for this program already exists in the form of the MEA modules. The faculty encourages tutors to do one course per semester, but this has historically been underutilised.

Many tutors have expressed concerns that our online teaching is simply running our usual material via online delivery platforms.

Developing teaching materials Online Teaching is a more involved process than simply re-running our existing materials. The same can be said for the actual teaching style. The skills and techniques our tutors have developed are geared at in-person teaching.

The plan here would be to appropriate the MEA budget and run a 6-hour training session for sessional staff. The session would include training for content development and content delivery. This is an opportunity to run a course that nearly all tutors stand to gain a lot from and which will yield great short term and long term value.

13 REMOVE **INFORMATION BOTTLENECKS** IN THE FACULTY BY ADDING NEW COMMUNICATION CHANNELS FOR SHARING EXPERTISE **AT EACH LEVEL**

ADDRESSES THE FOLLOWING ISSUES

Ineffective Allocation of Existing Resources	Communication Channels
	Delivery of Specialised Technical Support
	Training Material Accessibility
Pedagogical Stress	Preparation of Teaching Materials
	Student Engagement and Academic Expectations
	Transition of in-Person materials to Online Materials
	Stress Regarding eExam Design
Information Dissemination	Faculty to Unit
	Unit to TAs

DETAILED DESCRIPTION

The FIT organisational hierarchy as it relates to teaching has the following levels: students → TAs → units → up to faculty support functions (such as the FLEX team) near the top level. FIT communication channels currently flow according to the tree structure that results from this hierarchy. When a problem occurs at a certain level, it is escalated to a parent node in the tree, which later becomes an information bottleneck and inevitable source of frustration.

This proposal is to add constructive communication pathways within each level, so the faculty functions more as an interconnected network of expertise rather than a tree. In this mode, a solution to a problem can be *more readily found within the same leve*l, reducing the need to escalate issues to a higher level that might not be well-placed to offer a ready solution.

Focusing on the unit level, the status quo has been that any innovation that has been developed over many hours and tested in one unit may be completely unknown to other units that might benefit, and there is no repository where such solutions can be shared among teaching staff.

The solution under this proposal is to deploy a Wiki site where lecturers and admin tutors are asked to share white papers on successful teaching innovations and solutions in a browsable format, which other TAs are then encouraged to utilise in their own units. The FLEX team continues to facilitate as needed. This improves ROI on course development funds for the faculty and improves the longevity of pedagogical delivery innovations over the long term. Centralising training materials and policy documents on the same Wiki site adds further value by making such resources more accessible to staff.

14 A NEW TA-DRIVEN **TECHNICAL** TEAM TO PROVIDE HANDS-ON SUPPORT TO UNITS WITH SPECIAL **PRACTICAL** REQUIREMENTS.

ADDRESSES THE FOLLOWING ISSUES

Ineffective Allocation of Existing Resources	Delivery of Specialised Technical Support
Pedagogical Stress	Preparation of Teaching Materials
	Student Engagement and Academic Expectations
Teaching Staff Wellbeing	Inclusivity and Accessibility
	Fostering Productive and Harmonious Work Environment
	Sessional Staff Resources
Job Security for TAs	Alternative Opportunities for Sessional Staff
Technology/Infrastructure	Specialised Mandatory Software Student Access
	Availability of Specialised Technical Support

DETAILED DESCRIPTION

A frequent problem in units with specialised software systems has been that tutors have to do double-duty as unofficial IT support staff -- an inefficient allocation of labour and burden on busy teaching teams -- due to the fact that eSolutions is simply not well-placed to support specialised practical requirements in an agile or timely manner. Efforts by lecturers to innovate with hands-on lab environments and unique deployments have been routinely thwarted by a lack of technological tools and practical-oriented support at the level needed, which has produced an overall 'chilling effect' on the nature of technical lab experiences over several years. A protracted decline in hands-on lab experiences has been a source of disappointment among students who have been looking forward to strong practical lab experiences in later units as part of their Monash experience.

Under this proposal, a new specialised technical team is created to fill the gap between the existing FLEX team and eSolutions. The purpose of the new team is to support the needs of FIT units with special practical requirements in an agile way.

The team is recruited from a pool of existing TAs who are already at the right skill level to assist units with supporting unusual programming environments (including Linux-based and embedded systems) which are required for many units, but beyond the capability of eSolutions to adequately support. This allows the faculty to continue to leverage the skills of TAs who may not be required for tutoring, fosters a culture of excellence in lab-based teaching, and provides a new facility to enable delivery of more hands-on lab experiences in our units.

In addition to supporting technical teaching innovations in an agile and responsive manner, the team is also well-placed to provide direct consultative support to students on unusual software that may be required for a unit (such as installing an unusual library package for a programming language), and lifts this burden from the existing pedagogical delivery pressures faced by TAs.

15   COLLABORATION TOOLS FOR STUDENT TO SUPPORT GROUP WORK

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	Student Concerns and Anxiety
	Student Engagement and Academic Expectations
Information Dissemination	Faculty to TAs

DETAILED DESCRIPTION

Collaboration/group study in class/offline is crucial to help students get a better understanding of the learnings. But currently, the support is only available via Moodle forums or the breakout rooms (in the online teaching world). Moodle forums are not the most user-friendly platform for collaborative work and therefore students are reluctant to use it. Breakout rooms as we all know, cause issues when the class size is too big.

So, students have to find their own collaboration/communication platforms such as FB Messenger, WeChat to conduct collaborative work. This at times leads to issues because different nationalities are familiar with different platforms (e.g. WeChat vs Facebook and Viber) and they struggle to find a common platform because each chooses to pick the one most familiar to them

It would be better if Monash can provide them with an official collaboration platform where they can discuss their learning, conduct group tasks and do group study. Edstem is a possible platform that can replace Moodle forums. Likewise, more effective and user-friendly platforms that support collaboration would smooth the learning and teaching process

Once such platforms are decided upon, this information has to be effectively disseminated to students and teachers.

16   CHANGE IN TONE FOR FACULTY/CENTRAL TO SESSIONAL. TRANSPARENCY AND OPENNESS REGARDING UNCERTAINTY.

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	Preparation of Teaching Materials
Teaching Staff Wellbeing	Fostering Productive and Harmonious Work Environment
Job Security for TAs	Transparency Regarding Process for Hiring Sessional Staff
Information Dissemination	Central to Faculty
	Faculty to TAs

DETAILED DESCRIPTION

This proposal relates to enabling pre-planning of teaching materials in a timely fashion before the semester starts, and improving communication between our Faculty and Sessional TAs during the process of hiring/appointing.

At the moment this process is not really clearly communicated with TAs and the process itself is inefficient. The sessional TA recruitment process needs more transparency and structure in order to allow the most competent candidates to apply. Our faculty will benefit a lot in the long run and this will reflect in teaching quality and student learning outcomes.

Better structure in hiring /appointing sessionals will potentially allow teaching teams to perform more efficiently and start planning materials in advance. This will also benefit teaching teams even further by allowing them to spend more time on value-adding activities.

17 SESSIONAL TA SHARED WORKROOM

ADDRESSES THE FOLLOWING ISSUES

Teaching Staff Wellbeing	Fostering Productive and Harmonious Work Environment
	Sessional Staff Facilities

DETAILED DESCRIPTION

This proposal relates to the issue of sessional TAs having access to dedicated shared workspaces.

Our faculty has a large number of Sessional TAs delivering classes both at Caulfield and Clayton campuses. Their job also requires them to spend long hours on marking and teaching-related admin work outside the classrooms. The lack of dedicated workroom pushes them to take their work either to one of the libraries or home. During the semester libraries get very busy and securing a good spot becomes harder and ineffective use of time which cannot be claimed for.

Marking students' assignments and catching up with teaching-related admin work is just as important and critical for achieving desired learning outcomes. A dedicated shared workspace with basic facilities such as desks, printers and a small kitchenette would allow sessional staff to perform those duties in a more productive manner.

18 INVITE FIT EDUCATORS TO PARTICIPATE IN WELL-DESIGNED FIT WORKSHOPS TO ELICIT ONLINE EDUCATION IMPROVEMENT REQUIREMENTS AND DEVELOPMENT ACTION PLANS, MAKE CONSENSUS AT FACULTY LEVEL AND UNIT LEVEL UNDERPINNING *TPACK FRAMEWORK.

ADDRESSES THE FOLLOWING ISSUES

Ineffective Allocation of Existing Resources	Training Sessions Depth
	Training Session Specificity
Pedagogical Stress	Student Concerns and Anxiety
	Student Engagement and Academic Expectations
Teaching Staff Wellbeing	Inclusivity and Accessibility
	Fostering Productive and Harmonious Work Environment
	Empowering Sessional Staff
Job Security for TAs	Alternative Opportunities for Sessional Staff
	Secondary Activities Outside of Semester
Information Dissemination	Faculty to Unit
	Unit to TAs
	Faculty to TAs

DETAILED DESCRIPTION

Educators have seen an emerging need to synchronise students' expectations for on-line learning experience and educators' expectations for on-line teaching experience and strikes a balance to meet their respective needs.

With the commencement of Monash moving on-line education, faculty educators have been experiencing a big learning curve juggling with change acts such as content redevelopment and assessment redevelopment models and new way of technology-aided teaching whilst remaining focused on synchronous communication with students.

In this process, educators would have gathered rich data in terms of findings of adoption of synchronous technologies and asynchronous communication. However, there might be a lack of synergies among units' levels resulting in perceived teaching standards not uniformed (page 17 of the report with 7 votes with 2nd comment) and capitalise these insightful findings through a formal fully engaged communication channel. This opens an opportunity for us to step back, reflect and determine the key drivers to achieve uniformed teaching standards.

The solution is that the faculty invite all educators to participate in facilitated series workshops in between the semesters, commencing mid-year break 2020. Workshops would focus on series #1 reflecting asynchronous interaction and the synchronous moments, derive insightful discoveries. #2 reflecting and enhance pedagogical content underpinning TPACK Framework   #3 translate the findings into fit for purpose roadmap training guides to cater for a faculty wide solution. Educators with strong facilitation skills are encouraged to apply and co-facilitate in each breakout room.

Initially, teaching teams spanning a diverse IT disciplines would establish and develop the value-shared contents for best practice on-line engagement teaching models which can be rolled out to FIT as a trial, and progressively rollout to other campuses. A train-the-trainer approach could be adopted to implement the training model content for new educators.

By attending the workshops educators who participated would be rewarded on-line teaching Change Advocator's title with digital certificate to recognise their contributions.

LONG TERM PROPOSALS

19   MANDATORY INDUCTION **FOR STUDENTS** TO SET HEALTHY LEARNING EXPECTATIONS

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	
	Preparation of Teaching Materials
	Student Concerns and Anxiety
	Student Engagement and Academic Expectations

DETAILED DESCRIPTION

Misguided student expectations and inadequate learning and research skills for academia are a major driver of pedagogical delivery stress and difficulties among TAs.

Under this proposal, a mandatory student induction course is introduced and all new FIT students are required to participate. Such a program, correctly implemented, could save each admin tutor hundreds of hours of future difficulties per year. This course may be administered by the library.

Firstly, students are trained in independent research skills with the aim to make them less dependent on TAs outside contact hours. Secondly, students are prepared for the transition to the independent learning attitudes expected at a university level, with the aim to allow units to set less-trivial tasks with less resistance from students. Students are taught to attempt tasks independently without necessarily having been given a sequence of steps to a solution, and are then asked to apply their new learning skills by doing a mini-assignment as part of the course.

The purpose of the program is to empower students with healthy learning attitudes and covertly address unhealthy attitudes that can derail learning outcomes later if left unchecked. It is vital that such a program be made mandatory, since the students who most need to be reached in order to allow units to run more smoothly, are often the students who are least likely to realise they need such advice.

20   PROVIDE A NEW SHORT COURSE WITH AN **'ON-LINE EXPERIENCE BOOST'** THEME TO ATTRACT WIDER COMMUNITY'S ENGAGEMENT VIA MONASH'S EXISTING DIGITAL PLATFORM FUTURELEARN USING PUSH AND PULL COMMUNICATION STRATEGIES

ADDRESSES THE FOLLOWING ISSUES

Pedagogical Stress	
	Student Concerns and Anxiety
	Student Engagement and Academic Expectations

DETAILED DESCRIPTION

This proposal seeks to address Monash's global strategic direction of sustaining world class quality student experience and learning outcomes

Building on the MEA online training module, enrich the existing Monash FutureLearn Platform by adding one tailor-designed 'On-line Experience Boost' short course to allow wider communities' engagement. This initiative will potentially engage more students and working professionals to upgrade their skills, enrol in courses Monash offers.

The implementation could consider the combination of push and pull communication strategies via social media platforms i.e. Facebook, Monash StalkerSpace, Monash Twitter and Monash Workplace to reach out our communities.

The success criteria for this initiative could be increased enrolment rate of courses, small investment to bring global high impact and boosted students on-line learning experience.

VALIDATION, RESULTING REMARKS, AND RECOMMENDATIONS

The proposal statements in the previous sections are collated and deployed on the OURVOICE.APP platform to be rated and commented on by sessional staff and lecturers.

Anonymous participants from among the Faculty's TAs were able to rate proposal statements by casting a positive or negative vote for each proposal they wished to rate.

The approval ratings for each proposal together with the TFG Coordinator's remarks on the feedback received are shown below. For example, a rating of **+9 / -2** means that 9 participants expressed approval and 2 participants expressed disapproval to a suggested proposal.

	Proposal	TA rating	Remarks
1	Dedicated Non-teaching Time	+9 / -1	– A simple proposal which can offer long-term benefits to the Faculty, even if it was not as popular as some other proposals listed.
2	Training and Networking During Semester Breaks	+16 / -1	– A common-sense proposal to raise the effectiveness of training and networking sessions offered by the Faculty, which resonated well with the test audience.
3	Special Consideration Requests Decision-making at the Unit Level	+8 / -3	– This proposal was motivated by an admin tutor for a very large unit in the TFG who was frustrated at having control over special consideration requests centralised only to be passed back to decision-makers in the unit later on. – The rating suggests that this proposal was slightly controversial among TAs, and perhaps the right balance yet to be achieved.
4	Allow TAs to Obtain Favourable Prices on Necessary Resources, By Using the Faculty's Existing Buying Power to Negotiate Such Reduced Prices from Vendors	+20 / -2	– The **most popular** proposal by TA rating. The idea of allowing TAs to purchase their own equipment at prices available to the Faculty where such purchases would not be funded by the Faculty provides clear mutual benefits for TAs and the Faculty at large.
5	Support for Tutor Internet Issues	+15 / -1	– A popular proposal which should be considered on an as-needed basis.
6	Address Tutor Workspace Issues	+18 / -1	– This addressed the issue of tutors having inadequate space to work at home and between classes. See also proposal **17**.
7	Develop Mandatory Tailer-designed 'Online Learning' Training Modules to Boost Students' Engagement and Online Learning Journey	+5 / 0	– An ambitious proposal for development of training modules that would require further discussion and investigation due to the scope of the idea.
8	Create a Dedicated Students' Online Learning and Experience Feedback Inbox at Each FIT Unit Level to Capture Students' Voices	+6 / -1	– A suggested approach for units to obtain student feedback in an ongoing agile way.
9	Cultural Shift Regarding Staff Rooms at Caulfield	+11 / -4	– This proposal was motivated by some unpleasant experiences by one TFG member who had been told she was not welcome to use staff facilities after multiple hours of teaching, as well as signage which excluded TAs from tea rooms. – The response indicates that TAs in general have felt excluded more broadly than just Caulfield staff rooms. – A first step here could simply be to put up signs in staff facilities to build awareness among staff that TAs are welcome to use them.

10	(Re)development of Educational Material for Online Learning	**+12 / -2**	– This proposal seeks greater support for redevelopment of course material to fit an evolving situation.
11	Production of an eExam Readiness Manual	**+11 / -2**	– This proposal seeks for the development of a standard instruction and policy manual for eExam preparation, to clarify available resources and prevent problems from occurring due to reliance on assumptions.
12	Use MEA Budget for Online Development Training	**+5 / -1**	– This proposal suggests that an existing training budget is allocated in a more useful way to ensure adequate depth in training for TAs.
13	Remove Information Bottlenecks in the Faculty by Adding New Communication Channels for Sharing Expertise at Each Level	**+4 / -2**	– This proposal was aimed primarily at sessional lecturers and did not resonate with the majority of TAs surveyed. It is worth considering for its potential create long term benefits and improve efficiency of information sharing. – It also has the potential to create an environment where many complaints no longer arise in the first place, due to information flowing more freely between different units and removal of such pressures from higher levels of the Faculty.
14	A New TA-Driven Technical Team to Provide Hands-on Support to Units with Special Practical Requirements	**+11 / -1**	– Some units have not been delivered to their full potential due to a lack of technical support for more hands-on lab offerings. – This proposal allows the Faculty to further leverage the skills and training of experienced TAs in order to improve the quality of the Faculty's education offering in more technical units.
15	Collaboration Tools for Students to Support Group Work	**+4 / -5**	– This proposal was not well-received by TAs, who appear to prefer greater flexibility in choosing which learning tools should be utilised, rather than having this decision controlled by the Faculty.
16	Change in Tone for Faculty/Central to Sessional. Transparency and Openness Regarding Uncertainty	**+10 / -1**	– This suggestion is for greater openness regarding the hiring process to allow TAs to assemble competent teams and facilitate better planning of unit delivery.
17	Sessional TA Shared Workroom	**+18 / -1**	– All members of the TFG agreed that workspaces on campus have not been adequate to facilitate teaching- and unit coordination-related duties; and where such facilities have been provided, they have not necessarily been useable. – The feedback from this proposal indicates that TAs agree that some improvement is required here.
18	Invite FIT Educators to Participate in Well-designed FIT Workshops to Elicit Online Education Improvement Requirements and Development Action Plans, Make Consensus at Faculty Level and Unit Level Underpinning *TPACK Framework.	**+14 / -1**	– A elaborate proposal by a TFG member for adopting an established methodology in online teaching activities.
19	Mandatory Induction for Students to set Healthy Learning Expectations	**+13 / 0**	– Given the amount of time now spent by TAs responding to students whose requirements appear misguided or based on inappropriate academic expectations (at the expense of putting time into learning outcomes), such a mandatory induction is now *vital* for the long-term sustainability of our courses. – Just as staff inductions are vital for an organisation to run smoothly, a comprehensive student induction would help students better integrate into the academic framework of the Faculty. – Such an induction course could run during O-Week each semester.

| 20 | Provide A New Short Course With An 'On-Line Experience Boost' Theme to Attract Wider Community's Engagement via Monash's Existing Digital Platform FutureLearn Using Push And Pull Communication Strategies | **+4 / -2** | − An elaborate proposal which did not resonate strongly with the test audience. |

APPENDIX: ANONYMOUS QUALITATIVE RESPONSES TO PROPOSALS

In addition to rating proposals positively or negatively, TAs were also given the opportunity to post comments on each proposal, as well as to post further proposals of their own. This process was anonymous; comments were moderated by the OURVOICE.APP maintainer only to ensure they did not contain identifying information or profanity.

Due to time constraints, **these follow-up comments have not been discussed or endorsed by the TFG and are reproduced below without further comment.**

They may serve as a useful starting point for future discussions. Many of the comments express a broader scope or invite broader discussion than the particular proposal they were posted in reply to.

On support provided for course-development/delivery requirements

In past years, I have taught in units where lecturers have spent entire weekly meetings working with tutors to craft exciting and sustainable plans for teaching innovations in labs, put their team's agreed requirements to eSolutions, only to be fobbed off with a simple reply of "no" from a technician in eSol 20 minutes later. Taking advice from one of these lecturers 2 years later and asking how it all went, all the past enthusiasm I had seen in them had vanished. They shrugged their shoulders and said that they simply gave up trying to deliver excellence in the Monash environment, and I should too. It is utterly unacceptable that lab delivery requirements are held to ransom by the whims of commoditised IT support techs at "e-S.O.L." who have little or no interest in working with us for the learning outcomes that we NEED to achieve, and whose power of veto seems to overrule even the education designers in our faculty.

-— Comment on proposal 14. (TA-driven technical team)

It would be helpful if there were also more transparency regarding resources for develop of teaching materials in general. While it would be great to have a budget to redevelop material for an online audience, it would also be great to have the budget to redevelop the 'regular' materials - many units have old, or glued-together teaching materials, and it is difficult to get clear numbers on what Monash would be willing to invest to make these materials clean, up-to-date, and streamlined. I have been told that Monash is willing to invest 120 hours of work into redeveloping teaching materials *if the unit itself has been redesigned*; I do not know if these numbers are standardised. But for units with lectures, workshops, tutorials, assignments, in-semester tests, and final exams, a budget of 120 hours does not seem sufficient. (I understand lectures presumably are part of the lecturer's pay, and that assessment items are budgeted differently, but they are teaching resources and 'feed into' the other necessary resources. A good unit design will include considerations as to how the assessed tasks build on the non-assessed tasks and vice-versa. I also don't know what the total unit budget is for designing assessment, despite being involved in designing assessment in the past.) tl;dr: budget transparency for designing resources (online and off) would be nice.

-— Comment on proposal 10 (Redevelopment of course material for online learning)

On staff feeling excluded/under-resourced

There should be a career path for TAs. As it is, its more of a gamble than a career. Treated as though we are seasonal workers, rather than practically full time employees. We develop units, we deliver lectures, we create education. There should be hope at the end of this journey.

-— Anonymous follow-up proposal. Rated **+8 / -0** by other TAs after it was posted.

Some Sessionals have to bring everything with them to campus every time they come in (they do not have a desk etc if they are not a PhD student) - this includes silly things like their coffee mug, etc. Not having any place where they can leave their bags means that they have to take their bags everywhere with them (e.g. even going to the bathroom, & having to put it on the floor). Sessionals are also supposed to be professional in dealing with students, but the university doesn't provide anything beyond the basic (a few computers - or not even that (just a shared desk with using whatever chairs can be scrounged and which are NOT set up for individuals, but function on a one size fits all) in a cramped shared space; no space where they can sit between classes, etc). It is demoralising to be so invisible.

-— Comment on proposal 9 (Cultural shift regarding staff rooms)

Adding onto this: this is a very silly suggestion, but - an invitation to Luna Park. At the end of every year, the FIT faculty throws a party for FIT employees. Last year they went to Luna Park. PhD students (including part-time PhD students) and their partners get invited but sessional lecturers, admin tutors, and tutors are not. Many TAs work close to full-time hours during the semester, some work above. Sessional lecturers run units. The message sent by not being invited implies that sessional workers are second-class employees.

-— Comment on proposal 9 (Cultural shift regarding staff rooms)

I think sessional staff should be given some advantage (at least) in terms of the hourly rates for teaching in the fully-flexed mode. Some of them are not only overloaded with more teaching responsibilities but also facing ergonomic problems with their home office setups.

-— Anonymous follow-up proposal. Rated **+4 / -0** by other TAs after it was posted.

Marking assignments in the Library or other public space on campus is not ideal because of privacy issues.

-— Comment on proposal 17 (Sessional TA shared workroom)

On accessibility of training/networking/development sessions for TAs

Running these in semester breaks would be welcome. Running them online may also be a good way to do things long term as it will make it easier for those of us with kids and other responsibilities to attend. Also not all of us live near work so coming all the way in for a few hours can be hard to justify in terms of transport time and costs and juggling other work and responsibilities. Alternatively sessions could be brought together as a full day of Professional Development on campus.

-— Comment on proposal 2 (Training and networking during semester breaks)

So long as it is paid properly this would be one way to further integrate casuals into the faculty and what we do. Involving casuals in the Town Hall meetings would also help. Currently we have our occasional TA network meetings (which are easier to attend now that they are online), but otherwise our main channel of comms are just too overwhelming and there is no way to keep up with all the Workplace posts, etc, particularly when there is no payment to do so.

-— Comment on proposal 18 (Workshops to elicit requirements and planning steps / *TPACK framework)

On Special Consideration policy

I think it would be simpler to return to just allowing CEs to directly grant extensions as the current system just puts an extra hurdle up for unwell students.

-— Comment on proposal 3 (Special consideration procedure)

special consideration applications are accepted as long as they are submitted within two working days after the assessment deadline. this is clearly stated in the policy and has been so for many many years.

-— Comment on proposal 3 (Special consideration procedure)

On standardising software tools for students

Better to let students negotiate this. Never had a problem in any of my classes and they can find methods that suit them, rather than having to learn another way.

-— Comment on proposal 15 (Collaboration tools for students)