



DEPARTMENT OF EDUCATION,
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VIRTUAL ONBOARDING TRAINING FOR NEWCOMERS' LEARNING OF REMOTE WORKING TOOLS

Inhye Park

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Supervisor:	Adam Palmquist
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Abstract

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Purpose: The overall purpose of this study is to understand newcomers' learning of remote working tools concerning their adaptation to virtual teams and how virtual onboarding training can support them. Newcomers here are newly joined members of a workplace, and virtual teams are organisations operated by geographically distributed people relying on information and communication technologies. This is examined through design science research at an entirely remote working management consultancy firm in the process of designing a web-based training for new consultants.

Theory: The study is built upon the socialisation content approach rooted in the situated and social learning perspective. It provides a suitable framework to explore the multiple aspects of the continual learning process within the individual to adapt to a new job, called organisational socialisation, as well as the activities initiated by organisations to expedite newcomers' adaptation, called onboarding.

Method: The methodology used in the study is based on the design science research framework. This study followed a requirements-and development-focused design science research and included a combination of methods: document studies, qualitative content analysis, and the iterative process of human-centred design. The study combined the constructivist instructional principles while following the objectivist instructional methodology to develop a web-based training design.

Results: The study has revealed that newcomers' learning of remote working tools is intertwined with their adaptation to a virtual team. Newcomers understand social and performance aspects of the organisation while learning to use remote working tools. Insufficient learning of remote working tools aggravated challenging conditions in virtual onboarding. The study also outlined the requirements to design virtual onboarding training to support their learning and provided a tentative training design as an inspiration to address the defined requirements in practice.

Foreword

I would like to express my deepest appreciation to my supervisor Adam Palmquist, for his expertise, extensive experiences, and endless encouragement. His advice led me to take this project to a higher level than I could not imagine before its beginning.

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List of Abbreviations

ADDIE	Analysis, Design, Development, Implementation, and Evaluation
CMC	Computer-Mediated Communication
CM	Central business Management team
CO	County Office management team
FAQs	Frequently Asked Questions list
GIF	Graphics Interchange Format
GUI	Graphic User Interface
HCD	Human-Centred Design
ICTs	Information and Communication Technologies
IS	Information Systems
IT	Information Technology
IWG	Inform-Welcome-Guide
SLA	Service Level Agreement
UI	User Interface

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I. Introduction

Over the past two decades, technological advances and globalisation have caused an escalating trend shifting away from face-to-face operations to virtual operations (Hassell & Cotton, 2017). When COVID-19 caused the global pandemic in 2020, the share of employees working from home increased by 47% in OECD countries to cope with national-wide lockdowns (Ker et al., 2021). Undoubtedly, the outbreak of COVID-19 accelerated the trend toward virtual operations by universalising the experience of working from home across the world (Rampasso et al., 2022). After the pandemic, expectations for permanent remote work doubled, according to recent research (Enterprise Technology Research, 2022). Virtual teams are an increasingly high-profile work practice employed in different industries and organisations of all sizes (Lund et al., 2021).

Virtual teams are the organisations that operate relying on technologies to communicate and cooperate among geographically distributed members (Morrison-Smith & Ruiz, 2020). In substance, utilising virtual teams is a strategic choice for the competitiveness of organisations (Morrison-Smith & Ruiz, 2020; Peters et al., 2016). Because using virtual teams provides various potential benefits to organisations by allowing them to secure resources from diverse locations, reduce re-location costs (Aroles et al., 2019; Peters & Batenburg, 2015), and attract highly skilled workers, regardless of the geographic boundary (Morrison-Smith & Ruiz, 2020; Peters et al., 2016). Furthermore, virtual teams benefit individuals by enhancing job autonomy, time-spatial flexibility and reducing work-life conflicts (Peters et al., 2016).

To enable the performance of virtual teamwork from remote places, organisations provide their workers with tools and technologies (Saura et al., 2022; Weimann et al., 2013). Remote working tools in virtual teams include communication tools such as video conferencing software and online communication applications (Saura et al., 2022), as well as collaboration tools such as task tracking systems, timesheet-management systems, and document sharing applications (Weimann et al., 2013). These tools and technologies are indispensable for virtual teams' operations (Peters et al., 2016), from data security to daily collaboration and interpersonal interaction to organisational communication (Aroles et al., 2019; Howe et al., 2021; Lehner & Sundby, 2018a).

As a result, individuals' competency and proficiency in using such tools are crucial for the organisational performance of virtual teams (Lehner & Sundby, 2018). Similarly, for a newcomer joining a virtual team, developing the capability to utilise technological tools is essential to becoming a fully functioning team member in a remote work environment (Alexander, 2021; Saura et al., 2022). Therefore, supporting newcomers, newly joined members at a workplace, in learning to use remote working tools could be an ambition of virtual onboarding.

Here, *onboarding* is activities initiated by organisations to expedite newcomers' early adjustment to their new jobs, including formal and informal assistance methods, training, and guidance (Klein et al., 2015). Virtual onboarding is the practice of providing onboarding in remote environments, which is necessary for virtual teams lacking geographic proximity between team members (Britto et al., 2020). Organisations aim through onboarding to facilitate newcomers' learning of social and performance aspects of the new job so develop them into fully participating members (Becker & Bish, 2021; Chao et al., 1994; Klein et al., 2015). Among the numerous onboarding tactics developed and examined so far, training is the most broadly used for supporting newcomers to equip themselves with the required knowledge and skills (Klein et al., 2015). Virtual teams also have favoured online training for their onboarding to support newcomers in learning to use remote working tools (Klein & Heuser, 2008; Saura et al., 2022; Weimann et al., 2013).

However, not many studies have examined newcomers' learning of remote working tools concerning their adaptation to virtual teams, nor the ways to provide onboarding training in virtual work environments. Existing academic literature on onboarding has focused on collocated teams (Bauer,

2010), and very little is known about onboarding in remote environments (Rodeghero et al., 2021). Moreover, some studies conducted in remote work environments have urged caution about attempts at on-office tactics in virtual teams; replicating on-site activities in a virtual place does not show comparable results to face-to-face (Carlos & Muralles, 2022). One frequently pointed reason for this phenomenon is the dominant use of computer-mediated communication (CMC) which causes considerable limitations in regular interaction and first-hand observation between teammates (Begel & Hemphill, 2011; Britto et al., 2018; Carlos & Muralles, 2022; Rodeghero et al., 2021). Much of the practical knowledge for effectively delivering onboarding training by overcoming such constraints of virtual environments is still awaiting further investigations (Alexander, 2021; Britto et al., 2018; Margallo et al., 2021).

Meanwhile, having a greater understanding of virtual onboarding training is vital for the growth and development of virtual teams as well as for individuals navigating this new type of work environment. The context of this study makes it manifest. At the research site, newly joined professionals expressed difficulty learning remote working tools, while several did not complete their onboarding process and resigned. The organisation struggled to secure viable virtual training to support newcomers' adaptation.

To sum up, the implementation of virtual teams increases throughout different industries and organisations of all sizes (Lund et al., 2021). While virtual teams offer multiple advantages for organisations and individuals, their reliance on technology for daily operation requires team members' high competence in using remote working tools. Therefore, training newcomers to attain knowledge and skills to use such tools is the "non-negotiable" requirement for the successful onboarding of virtual teams (Alexander, 2021, p. 209). Despite the high demand for onboarding practices to support newcomers in learning remote working tools, there has been an apparent knowledge gap on enabling practical onboarding training in virtual teams. The overall purpose of the present study is to understand newcomers' learning of remote working tools concerning their adaptation to virtual teams and how virtual onboarding training can support them. This is examined through design science research at an entirely remote working management consultancy firm in the process of designing a web-based training for new consultants. The below research questions (RQ) will lead the inquiry of this thesis.

RQ1: How is newcomers' learning of remote working tools related to their adaptation to virtual teams?

RQ2: What are the requirements when designing virtual onboarding training to support newcomers' learning of remote working tools?

Answering the posed questions will contribute to understanding the multi-dimensional aspect of newcomers' learning and their early adaptation to virtual teams, where multiple human agents and artefacts interact. It will also benefit virtual teams to develop effective onboarding training and, through that, eventually help professionals to be successful in their adaptation to their new job in remote work environments.

According to the posed RQs, this study has the following structure. The first chapter is the background section that presents the description of the research domain, significance and the purposes of the study and unpacks the research questions. The second chapter presents the review of existing literature relevant to the present study. It introduces the main concepts used throughout the study: onboarding in remote work environments, socialisation contents, and onboarding practices. The theoretical framework used in the study is outlined here. Following this, the third chapter describes the design of the research, the research site, methods of data collection and analysis, as well as ethical considerations. Findings of the study are presented in the fourth chapter, including the process of developing a tentative training design as an inspiring example of how to address defined requirements in practice. The fifth chapter discusses the results, implications and recommendations for future work, and potential limitations. The overall conclusion is presented at the end.

II. Literature review

The following chapter covers previous research in the scope of the present study. Thus, the focus will be on presenting summaries of existing literature on mainly three topics: *onboarding in remote work environments*, *socialisation contents*, and *onboarding tactics*. Focusing on these topics, the keywords guiding the selection of previous research were onboarding, virtual team and remote work, newcomer, and online training. The last section of this chapter outlines the theoretical framework used in the study.

2.1. Onboarding in remote work environments

This section firstly introduces the main concepts of the study, onboarding and organisational socialisation, then reviews what has been examined about virtual onboarding through previous studies.

2.1.1. Onboarding and organisational socialisation

Onboarding appears in much literature as an interchangeable term for organisational socialisation (Bauer & Erdogan, 2011), which socialisation research has primarily viewed as a learning process (Chao et al., 1994; Feldman, 1976; Gherardi & Perrotta, 2014). Klein et al. (2015) suggest distinctions between two concepts based on the definitions provided by previous literature. According to their differentiation, organisational socialisation refers to a continual process occurring within the individual throughout one's career. In contrast, onboarding is a set of activities initiated by organisations to expedite newcomers' early adjustment. Endorsing this differentiation, this thesis separately uses two terms.

As job changes are more frequent nowadays, onboarding has become a more critical issue than before (Bauer & Erdogan, 2011). From an individual's perspective, it helps the process where newcomers learn social and performance aspects of the new job (Becker & Bish, 2021) and cognitively make sense of work environments and their role in the new organisation (Klein & Heuser, 2008) and finally become fully participating organisational members (Chao et al., 1994). Onboarding is critical for organisations to develop newcomers into "effective organisational members and more productive in their new roles" (Klein & Heuser, 2008, p. 280).

2.1.2. Virtual onboarding

As entirely remote working organisations appeared only recently, far little empirical data has been reported about onboarding in virtual environments (Carlos & Muralles, 2022). A large body of literature has investigated the transition from collocated to virtual teams, although telework or virtual teams were researched long ago (Morrison-Smith & Ruiz, 2020). Socialisation studies have a propensity for focusing on human agents' role in building social relationships and delivering information (Rodeghero et al., 2021). Meanwhile, virtual onboarding often appeared in literature with an emphasis on limited interactions due to the inherent difficulties in using CMC (Carlos & Muralles, 2022). Thereupon, prior research acknowledged that the existing knowledge yielded from the studies on collected teams is not necessarily fit for virtual teams (Rodeghero et al., 2021). Accordingly, there has been a call for research on effective onboarding tactics in remote work arrangements.

One of the studies illuminating this area is Hemphill and Begel's (2011) work. They had conducted an empirical case study at a software development company that had hired new remote members in five teams. The authors interviewed and observed newcomers, their direct managers, and mentors during the early remote organisational socialisation period. They identified the lack of informal communication and invisibility of teammates' work as key factors that negatively affect learning through virtual onboarding. Both factors hindered newcomers from observing tacit work practices and getting feedback on work pace. Especially, they struggled to seek information about tacit knowledge, best (and bad) practices, and the usual work pace of teammates, as well as to understand collaboration processes and circumstances around the team. To overcome the invisibility of problems, the authors suggested more explicit methods to transfer implicit information, such as documentation that comprehensively explicates team practices and procedural knowledge.

Before the pandemic, Britto et al. (2018) conducted another holistic study investigating the onboarding practices in three globally distributed software companies. Their observation captured that each organisation had applied tactics in various combinations for each unique circumstance of the team and newcomers. Based on the results of this study, the authors outlined recommendations and implications for effective onboarding: clear job expectations, a formalised onboarding plan, information transparency between distributed work sites, travelling for in-person meetups, extensive mentoring, tailored training, and feedback on newcomers' work. However, some are specific to the context of distributed software development teams. Therefore, they may not apply to virtual teams with no on-site activities or organisations in other industries.

Since the COVID-19 pandemic urged massive application of working-from-home practice across the world, the studies reporting virtual onboarding cases have continued in various professional areas. Although most of those studies have been carried out on temporally remote working organisations for emergent measures rather than permanent virtual teams (Carlos & Muralles, 2022; Margallo et al., 2021), their findings provide proximity observation on sceneries of virtual onboarding.

A noticeable study during the pandemic is the one by Rodeghero et al. (2021). They conducted a sizable survey on new employees entering Microsoft in early 2020. Through qualitative and quantitative analysis of 267 responses, they found that newcomers typically experienced challenges in doing the following activities during virtual onboarding:

- Scheduled or spontaneous meetings and chatting
- Getting feedback and asking questions
- Recognising their role and contribution to their team
- Searching for information about the internal process
- technical and hardware issues around setting up the remote work environment.

In the same year, Carlos and Muralles (2022) inspected a new librarian's onboarding case replicated in a virtual environment due to the pandemic by applying an autoethnographic approach. Their findings emphasised that the newcomer needed help to deepen relationships, identify short-term goals and receive feedback on learning progress. They reported that the challenge of physical isolation was most highlighted in "the lack of unseen, unspoken physical cues" (Carlos & Muralles, 2022, p. 39), which is in line with the invisibility of teammates presented by Begel and Hemphill (2011).

Regarding the recent studies during the pandemic, researchers acknowledge that the unprepared sudden transition while the emergent situation might amplify difficulties of organisational socialisation in remote work arrangements (Carlos & Muralles, 2022; Rodeghero et al., 2021). Although it is required to be wary of stretching the findings from such a unique situation to a prearranged remote work environment, the difficulty in accessing tacit knowledge was consistent with the observation in the general virtual teams' case.

Overall, previous studies denote the importance of explicating implicit work practices and knowledge to improve virtual onboarding practices. On the other hand, the issue related to remote working tools appears as a surrounding set-up of organisational socialisation.

2.2. Socialisation contents

This second section firstly reviews the main concepts of the study, onboarding and organisational socialisation, then reviews what has been examined about virtual onboarding through previous studies.

2.2.1. The dimensions of socialisation content

One of the main perspectives of organisational socialisation research is the *socialisation content approach*, which "views socialisation as primarily a learning process in which newcomers acquire a variety of information, attitudes, and behaviours in order to become more effective organisational

members” (Klein & Heuser, 2008, p. 296). This approach focuses on the identification of the content that newcomers are required to learn during the early adjustment (Chao et al., 1994; Cooper-Thomas & Anderson, 2002; Haueter et al., 2003). Recognising the content areas that newcomers must learn means assessing the first-hand impact of organisational socialisation as well as the effectiveness of onboarding tactics (Klein & Heuser, 2008).

The socialisation content approach has developed several models to identify socialisation learning outcomes (Klein & Heuser, 2008). One of the prevalent models is the six dimensions of the socialisation domain developed by Chao et al. (1994), which includes organisational goals and values, history, politics, language, people, and performance proficiency. Although there is no inclusive typology of socialisation learning content, the later literature acknowledges that these six areas represent a thorough segmentation (Bauer & Erdogan, 2011; Becker & Bish, 2021; Wesson & Gogus, 2005). As a proposal for a complete typology, Klein and Heuser (2008) expanded Chao et al.’s model into 12 dimensions by refining segregations and complementing omissions based on academic and practitioners’ literature (Table 1)

Table 1. Klein and Heuser’s expanded dimensions of socialisation content

Dimension	Construct Definition
Language	The extent to which the individual has learned the unique technical language, acronyms, slang, and jargon
History	The extent to which the individual has learned the history, traditions, origins, and changes
Task Proficiency	The extent to which the individual has learned the necessary job knowledge and skills needed to successfully perform required “in-role” tasks
Working Relationships	The extent to which the individual has learned the necessary information about others to establish effective working relationships including the learning of work colleagues’ expectations, needs, and working styles
Social Relationships	The extent to which the individual has learned the necessary information about others to develop a network of social relationships including the extent to which an individual has learned personal things about a work colleague (i.e., common interests, family)
Structure	The extent to which the individual has learned the formal structure including the physical layout and where formal responsibility and authority is assigned
Politics	The extent to which the individual has learned the informal power structure including where actual control of resources, decision making, and influence over decisions resides
Goals and Strategy	The extent to which the individual has learned the current product/ market mix, competitive position, mission, goals and strategies
Culture and Values	The extent to which the individual has learned the customs, myths, rituals, beliefs, and values including guiding principles, symbols, and ideology
Rules and Policies	The extent to which the individual has learned the formal workplace rules, policies, and procedures
Navigation	The extent to which the individual has learned the implicit rules, norms, and procedures of the workplace
Inducements	The extent to which the individual has learned what is offered in exchange for their contributions including pay, development opportunities, benefits, and intangibles

Note. “Expanded Dimensions of Socialisation Content” in “The learning of socialisation content: A framework for researching orientating practices” by Klein and Heuser (2008)

For researching the impact of onboarding training, such multi-dimensional models are a functional device that identifies gaps between required socialisation learning contents and the learning material the organisation provides (Wesson & Gogus, 2005).

2.2.2. The content of virtual onboarding

The performance of virtual teams inherently relies on information and communication technologies (ICTs) to mediate the communication and cooperation of geographically distributed workforces (Morrison-Smith & Ruiz, 2020). A comparable term for virtual teams is teleworking, which is the work arrangement allowing employees to perform in places apart from the location where the work is typically done by using ICTs (Taskin & Bridoux, 2010). While the concept of virtual teams focuses on ongoing collaboration by spatially dispersed people, teleworking refers to a discontinuous remote work practice on the premise of a physical workplace where regular workers perform tasks. Despite this difference, both concepts address the critical role of ICTs in enabling organisational operations in remote work environments.

Nowadays, it is less likely to find an industry or public sector running daily operations without implementing ICTs and information systems (IS) (Lehner & Sundby, 2018). However, it does not diminish the cruciality of technologies in implementing remote work environments (Lehner & Sundby, 2018). For example, virtual teams rely on ICTs applications for internal and external communication (e.g. video conferencing tools and ticket systems) (Hassell & Cotton, 2017; Maynard & Gilson, 2021). IS, such as tasks and transaction management systems, are vital for virtual teams (e.g., billing systems and e-commerce applications) (Blili & Raymond, 1993). Some technological tools are more closely related to value production, which allows workers to collectively produce goods or services in virtual workplaces (Hassell & Cotton, 2017; Hull et al., 2019). In this thesis, remote work tools refer to the IS and ICTs utilised by a virtual organisation to facilitate teleworking as their regular way of work activities. It does not exclusively refer to applications only for virtual teams but also includes those online collaboration tools for all types of organisations.

Studies in the field of information technology (IT) adoption often report that adequate reflection of the organisation's strategy, rules, internal power dynamic, and work practices resulted in the intended effect and helped to avoid adverse results (Blili & Raymond, 1993). Hence, a well-known approach to implementing a new IS is investigating the organisation's strategy and work practices in the area that will employ the new system; identifying the development requirements based on the investigation; developing a new system or customising the standard system accordingly (Blili & Raymond, 1993). Similar, IT adoption literature has recommended considering such circumstances of organisations when assessing applications in the market for IS implementation (Blili & Raymond, 1993).

If so, a virtual team would likely use remote work systems that reflect their organisational structure and work practices. In other words, how a virtual team uses ICTs and IS could reflect how the organisation intends and practices: how to work in what order, what to pay attention to while operations, what to prioritise among tasks, what terminology to use and what to communicate with whom. The answers to these questions constitute the criteria for the decision-making to implement the remote work system at an organisation. Further, newcomers entering a virtual team could learn such rules and values, language, people, performance and politics (Chao et al., 1994) through the process of understanding how to use remote working tools. Accordingly, newcomers' learning of remote work tools may contribute to the core cognitive processes of organisational socialisation, which is making sense of the surrounding environment in their new jobs.

2.3. Onboarding tactics

Onboarding practices are a central research topic in the field of organisational socialisation research (Klein et al., 2015). It is well known that most organisations employ specific onboarding practices with several distinct purposes: to support newcomers in easing anxiety during the transition period, to help their cognitive process for making sense of a new work environment, and to provide them with enough

resources of implicit and explicit knowledge to become effective inner members of the organisation (Klein et al., 2015).

However, there is little consensus on onboarding tactics: which practices should be used and under what specific conditions, either among scholars or practitioners (Britto et al., 2020; Klein et al., 2015). Instead, the ways of deploying specific practices vary greatly depending on the organisation (Klein et al., 2015). Accordingly, this section first overviews typologies of the onboarding practices that emerged within the field of organisational socialisation research. It then describes the considerations for the common characteristics of newcomers joining virtual teams.

2.3.1. Typologies of onboarding practices

One of the most extensively examined approaches to onboarding practices is the model provided by Van Maanen and Schein (1979, as cited in Klein & Heuser, 2008). They proposed categorising onboarding practices under the following six dimensions: collective versus individual, formal versus informal, sequential versus random, fixed versus variable, serial versus disjunctive, and investiture versus divestiture (Begel & Hemphill, 2011; Britto et al., 2020). Refining their theories, Jones (1986) suggested a one-dimensional model that reduced the original six dimensions to two: institutionalised and individualised (Britto et al., 2020). His model merges collective, formal, sequential, fixed, serial, and investiture onboarding practices into the institutionalised category and opposed tactics into the individualised category. Many recent studies have found that institutionalised practices are more efficient than individualised practices (Britto et al., 2018; Klein et al., 2015; Rodeghero et al., 2021). Moreover, considering the importance of explicit knowledge to improve organisational socialisation in remote work environments, virtual onboarding tactics could put weight on more formalised and institutional methods.

Later, Klein and Heuser (2008) sought to identify appropriate onboarding tactics for each socialisation content through a systematic approach. Based on an extensive review of onboarding practices across both academic and practitioner literature, they developed the Inform-Welcome-Guide (IWG) framework that categorises onboarding practices according to their primary purposes (Table 2).

Table 2: The categorisation of onboarding practices by the IWG framework

Categories	Sub-categories	Description of category or sub-category
Inform		Activities that provide information, materials, and experiences
	Communication	Planned efforts to facilitate communication with newcomers. Includes both the provision of one-way messages and opportunities for two-way dialogues
	Resources	Making materials or assistance available to new hires. These efforts differ from communication in that the new hire has to take the initiative to access them
	Training	Planned efforts to facilitate the systematic acquisition of skills, behaviours, knowledge
Welcome		Activities that provide opportunities for new hires to meet and socialize with other organizational members and/or celebrate the arrival of the newcomer
Guide		Activities that provide a personal guide for each new hire

Note. The table is modified from the table “A Typology of Socialization Practices” in “The learning of socialization content: A framework for researching orientating practices” by Klein and Heuser (2008).

First, the Inform category is defined as activities that provide newcomers with knowledge, learning materials and experiences. This category is the largest and includes sub-categories: communication, resources, and training. Second, the Welcome category's activities express congratulations on newcomers' joining and help them build relationships within the organisation. Third, the Guide category provides newcomers with personal assistants like a formal "buddy". This framework outlined Inform-training and guide practices as optimal instructional methods for facilitating learning across different content dimensions in organisational socialisation.

Based on the IWG framework, Klein et al. (2015) conducted an empirical study, which surveyed what specific onboarding practices newcomers experienced and how they precepted those practices in ten organisations. Their findings confirmed that the framework is advantageous for classifying specific onboarding practices. Additionally, it is noteworthy that each onboarding activity showed different perceived effectiveness; among them, on-the-job training was the most highly rated practice for helpfulness.

In prior literature, researchers utilised existing typologies as tools to build a systematic understanding of onboarding tactics used in research sites (Begel & Hemphill, 2011; Britto et al., 2018; Rodeghero et al., 2021). Moreover, analysis based on theoretical typologies allows the research findings to contribute to a common knowledge base (Wesson & Gogus, 2005).

2.3.2. Considerations for newcomers' characteristics

In organisational socialisation research, the term newcomers refer to new members of a specific organisation rather than novices in a professional field (Bauer, 2010; Becker & Bish, 2021; Britto et al., 2018). Because every organisation has its unique set of organisational socialisation content, all newcomers experience the transition from outsiders to insiders regardless of their professional experience or seniority levels (Bauer & Erdogan, 2011; Klein & Heuser, 2008).

Nevertheless, a noticeable consideration is that remotely working professionals have certain characteristics regarding the level of work experience. The previously described typical remote workforce was high-income earners, the highly skilled and advanced service employees (Elldér, 2019). Although the remote work practice has proved its viability in a broader range of industries during the pandemic, the eligible remote workforce is mainly white-collar workers (Lund et al., 2021). According to Becker and Bish (2021), newcomers' prior work experience significantly affects the learning process for organisational socialisation. Thereupon, how experienced office workers engage with workplace learning needs to be marked for developing onboarding practices for virtual teams.

Cooper-Thomas et al. (2012) investigated experienced newcomers' organisational socialisation strategies in a large professional services organisation. Their study discovered that these newcomers choose more varied strategies than has been claimed in previous studies. The findings suggested that experienced newcomers use opportunistic strategies to learn or seek information. These strategies include observing or following colleagues, attending organisationally-directed socialisation activities, and reading organisational manuals or documents. Such strategies may synergise with those Inform category onboarding practices (Klein & Heuser, 2008), providing diverse resources such as explicit guidance and reading materials.

In addition, studies suggested that experienced professionals value empowerment in their learning more than their novice counterparts do. The empirical study by Fenwick (2012) implies that the wide range of resources available to them relates to their characteristics as learners. She interviewed experienced white-collar workers to understand their learning strategies in professional development. While these older professionals possessed a wide range of resources and strategies for learning, they also anticipated determining the areas and methods of knowledge development by themselves (Fenwick, 2012). Tikkanen and Billett (2014) also suggested that professional workers have preferences for how to learn and value learning and development on an ongoing base. They emphasised that, for experienced

professionals, training tactics should consider facilitating the learning through practical experiences while providing appropriate assistance.

2.4. Theoretical framework

The present study chooses the socialisation content approach for a theoretical framework. The approach is rooted in the situated and social learning perspective grounded in the situated learning theory (Gherardi & Perrotta, 2014). From this approach, organisational socialisation is primarily a learning process that occurs across individuals' careers to become more effective organisational members (Klein & Heuser, 2008). The approach and the underlying ideas of situated learning theory provide suitable models and tools to explore the complex learning phenomena of organisational socialisation that individuals, organisations and technological tools interact and are interrelated.

As the socialisation content approach was chosen to guide this research, learning of remote working tools can be understood in relation to the socialisation content dimensions introduced in this chapter. The approach also provides the onboarding practice typologies introduced in the second section of this chapter. Using those typologies allows this study to approach the suitable characteristics of onboarding practices.

Lastly, from the socialisation content approach, onboarding tactics are for facilitating legitimate peripheral participation, which is the central idea of the social learning theory (Gherardi & Perrotta, 2014). Legitimate peripheral participation denotes the learning process where learners legitimately access the practices and knowledge in the community through the opportunities to participate in a peripheral role in authentic situations (Lave & Wenger, 1991). From the social learning theory perspective, legitimate peripheral participation is a prerequisite for enabling new members to progress into fully functioning members of the community (Lave & Wenger, 1991). It endorses those onboarding practices offering newcomers participation in simple and low-risk activities within the practical context of their new job (Gherardi & Perrotta, 2014). This idea becomes the basis of the design activities of this study to suggest tentative training.

III. Methods

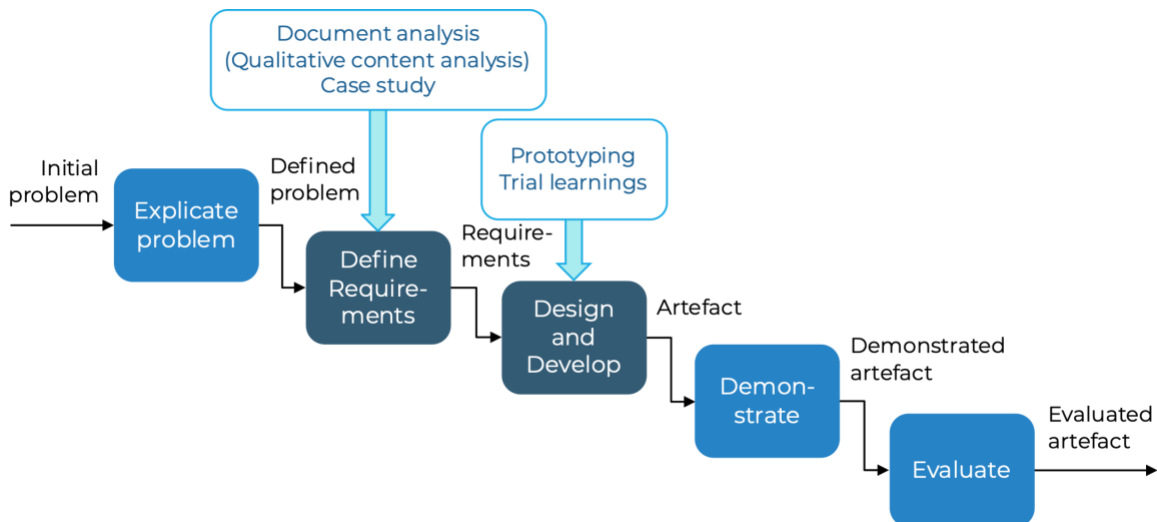
Underlyingly, supporting newcomers to develop competence with remote working tools is crucial for virtual teams and as well as for professionals joining the teams. In addition, remote work environments are challenging to grant access to tacit knowledge and facilitate feedback on learning progress defeating the limitations. Although formal training is a prevailing onboarding tactic to help newcomers learn knowledge and skills in on-office environments, how to implement it in virtual workplaces is still in question. This study employed requirements-and development-focused *design science research* to expand our understanding of newcomers' learning of remote working tools and virtual onboarding training by answering RQ1 and RQ2.

3.1. Design science research

This thesis research is design science research (DSR). DSR is an appropriate approach to increasing the existing body of knowledge in a particular domain and aims to improve or create an artefact as a solution to address a real-world problem (Boström & Sjöström, 2022; Johannesson & Perjons, 2021). An artefact in DSR is an object designed to support people in solving problems in their practices (Johannesson & Perjons, 2021). Artefacts can take different forms as some are physical objects, such as umbrellas and microscopes, and others are drawings and design plans, such as a blueprint for a building (Johannesson & Perjons, 2021). The artefact in the present study is the online training to help newcomers to attain necessary competency using remote working tools in the work environment of virtual teams.

The DSR approach adopted in this study followed the framework by Johannesson and Perjons (2021). They divided the activities in a design science project into five steps: *Explicate problem*, *Define requirements*, *Design and develop*, *Demonstrate*, and *Evaluate*. (Figure 1).

Figure 1. The summary of the DSR process employed in the research project



Note. The figure is modified from the figure “Overview of the method framework for design science research” in “An Introduction to Design Science” by (Johannesson & Perjons, 2021).

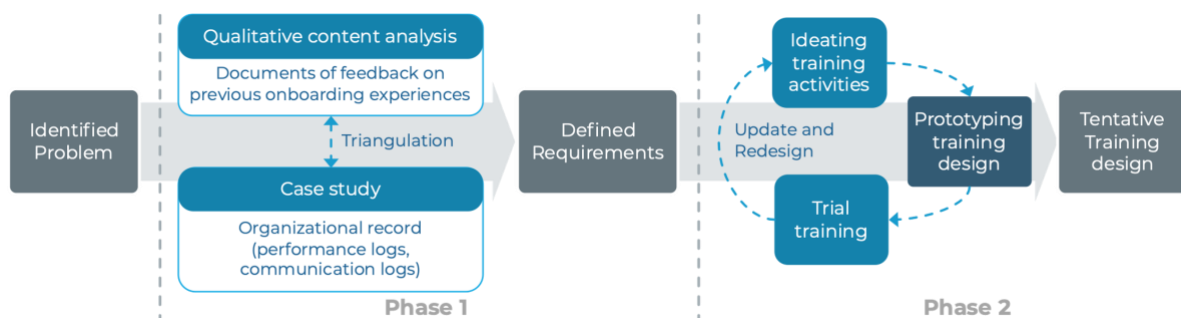
A DSR project goes through an iterative process between these interrelated activities, which influence each other until achieving the final design of the artefact (Boström & Sjöström, 2022). In many cases, design science projects focus on one or two activities instead of undertaking all five in-depth (Johannesson & Perjons, 2021). Here, I focused primarily on defining requirements and developing a training design. I explored the desired training content and instructional methods for learning to use

remote working tools in virtual onboarding. I also developed a training design to progress toward the solution and further my understanding of the requirements. The tentative training was used for trials to validate the defined requirements. Figure 1 illustrates this DSR framework with research designs for this thesis. The dark boxes are the main activities, and the focused activities are marked with a darker colour. The monodirectional arrows represent not the sequential order of activities but input-output relationships because a design science project is always an iterative process (Johannesson & Perjons, 2021).

A design science project commonly combines different approaches depending on the purpose of each activity. Using appropriate research methods for defining requirements is vital to ensure the validity and reliability of the produced knowledge, and creative methods are more useful for designing an artefact (Johannesson & Perjons, 2021). The white boxes in Figure 1 are the research and creative methods I utilised to collect data and build the training design.

In outline, this thesis project includes two phases: *Define Requirements* and *Design and develop*, as shown in Figure 2.

Figure 2. Research design



Phase 1 corresponds to the Define Requirements step of the DSR approach. I first investigated previous organisational socialisation experiences to answer RQ1 and derive desired requirements for onboarding training supporting newcomers' learning of remote working tools. In this phase, I used the mixed methods approach to combine two data sources from different groups of newcomers for the methodological triangulation (Johannesson & Perjons, 2021; Silverman, 2009). Phase 2 corresponds to the Design and develop step of the DSR approach. To answer RQ2, I developed a tentative training design and conducted three trial training sessions to evaluate the design and refine the requirements. The overall approach to design was guided by the iterative method of human-centred design (HCD), where designers continuously refine and enhance a design solution through the iteration of observing users (in the present research, newcomers as users), generating ideas, prototyping, and testing (Norman, 2013).

3.2. Research site

The research site of this thesis project was a professional management consulting firm, Agseny (a pseudonym), where I worked as a trainee. The firm is a fully remote working organisation having no physical office. Around fifty workers, including the top management, have been working only remotely in distributed locations across five countries on three continents.

The most frequent newcomers at the research site were consulting professionals joining its Norway branch, and this research also focused on this population. At the time of the research, nearly 80% workforce of Agseny were consulting professionals such as accountants and lawyers. Most of them were working at the Norway branch with indefinite contracts. The brunch was the most extensive in business

scale and central to the company’s business development. One of the recruiting criteria for these consultants was having more than five years of experience in the professional service domain.

Another 20% of the workforce worked for business management, sales and IT system development. Due to the international nature of its business, Agseny divided its management functions into two levels: the central business management team (CM), which develops business strategies and provides IT infrastructure, and the country office management team (CO), which is in charge of business operations in each country.

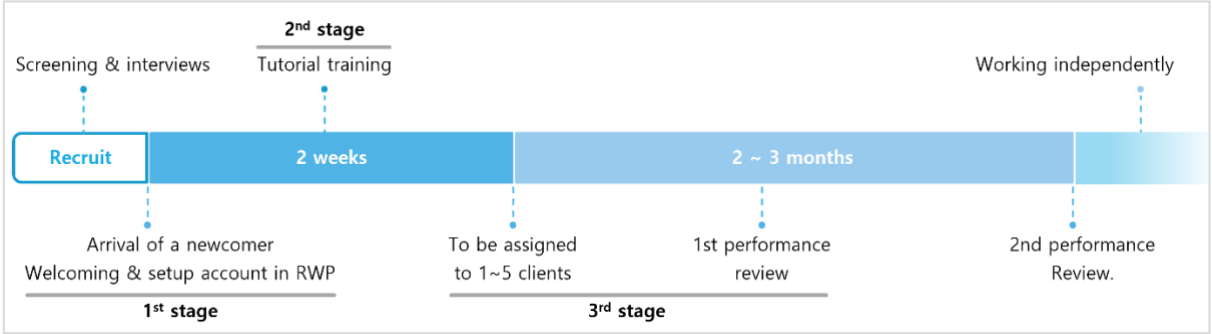
3.2.1. Remote working tools at the research site

The company utilised a tailored remote work platform called RWP (a pseudonym). It was a web-based software combining various tools, including a support ticket system, intelligent call routing system, instant messaging and video meeting software, task tracking system, time-sheet-management system, and document sharing system. Consultants used RWP to perform routine daily operations, such as team communication, client management, task management, and invoicing. Using all-in-one software was the company’s strategy to create an integrated information flow across the organisation and achieve efficient collaboration in a remote work environment. Therefore, new consultants were required to attain a sufficient understanding of RWP and the ability to operate various tools on the platform to be productive in their new job.

3.2.2. Previous onboarding process

At the time of the research beginning in January 2022, Agseny’s onboarding practices consisted of three stages summarised in Figure 3.

Figure 3. The three stages of the previous onboarding process



The first stage was welcoming. At this stage, CO configured a new user account on the platform and sent invitation emails guiding login to RWP. Following the guide, Newcomers installed the necessary authentication applications and made their first access. The second stage was online tutorial training, where newcomers were assigned a prearranged task in RWP. The tutorial task consisted of 38 sequential subtasks introducing rules and terminologies, utilities of RWP and work procedures in brief text and some example images. The envisioned time for newcomers to complete this task was within two weeks. The third stage was an apprenticeship in which newcomers began performing a few tasks for a limited number of clients. Meanwhile, the assigned manager closely reviewed their performance and determined whether they could work independently following service quality standards and policies. According to the internal statistic for the recent five years, this formal onboarding process usually took three months for newcomers to go through.

Between 2018 and 2021, only 53% of newcomers had accomplished the onboarding process. Even though the final stage was for the screening performance level, the proportion of successful onboarding cases was surprisingly small, considering new consultants already had at least five years of experience working with clients when they joined. Meanwhile, the internal research conducted by CM in 2021

discovered that more than two-thirds (i.e., 17 of 25) of participants expressed dissatisfaction with onboarding activities. CM acknowledged the need for improvement in the onboarding process to sufficiently support newcomers' adaptation.

A relationship between ineffective onboarding and high turnover is also suggested in previous literature (Bauer & Erdogan, 2011). A consensus is that the onboarding experience affects newcomers' job satisfaction, organisational commitment, and withdrawal (Bauer & Erdogan, 2011). Such research supported the idea that better onboarding activities could aid the retention of newcomers.

3.3. Research methods

This project was initiated by acknowledging the problem in the virtual onboarding at the research site. To understand newcomers' learning of remote working tools in the entire context of virtual onboarding, I conducted two studies to investigate previous newcomers' experiences during phase 1 (Figure 4).

Figure 4. Phase 1: Define requirements



The first study used qualitative content analysis on the data collected from 22 transcripts of feedback interviews about previous onboarding activities. The second was a case study where I analysed the six resignation cases of newcomers. The case study focused on the reasons for their resignation based on their survey responses and, subsidiarily, circumstantial evidence found in RWP. The following sections will provide the data collection and analysis methods used in phase 1.

3.3.1. Documents studies

Both studies conducted during phase 1 used documents as a source of data. *Documents studies* are one of the most broadly used data collection methods for empirical research (Johannesson & Perjons, 2021). Documents have a character of secondary data, which have become produced for another purpose than the aim of research using them (Silverman, 2009). Thus, using documents as a data source takes advantage of collecting a large amount of data in a relatively short period than those methods requiring the direct intervention of researchers (Johannesson & Perjons, 2021).

On the other hand, the data collection using documents poses a credibility issue: to ascertain the authenticity, accuracy and objectiveness of recorded content (Johannesson & Perjons, 2021). Determining the credibility of a document can be done by reflecting on who produced the document for what purpose in which way (Johannesson & Perjons, 2021). Thus, the following parts will present the context, purposes and authors of the document used for the two studies carried out in phase 1. The data source for the first study was transcripts of interviews produced by CM. The second source included a survey result and organisational records such as performance logs and internal communications.

3.3.1.1. Transcripts of interviews

When this project began, CM had completed transcribing video-conferencing interviews conducted by a practitioner a few months before the present research. It was a part of internal research aiming to gather feedback about onboarding activities in the past. Participation was voluntary, and the interview time was compensated by counting it as legitimate working hours. All consultants in the Norway branch, a total of 33 people, were invited, and 22 of them participated. The interview followed a semi-structured format initialised by these four questions: 'What do you think of training for consultants?', 'Was the

training for the RWP intuitive and easy to understand?', 'How was the experience of getting the first client?', 'Do you prefer watching videos rather than reading text for the training method?'. All interviews were one-to-one and in Norwegian, the native language of the interview facilitator and participants. Another practitioner, also a native Norwegian speaker, transcribed recorded videos manually. I translated them into English using an automatic translation tool. Later some errors in the translation were corrected with the aid of the transcriber. After the translation, the total length of transcripts was nearly 11,000 words.

Table 3. The entrance year of interview participants

Joined at	2017	2018	2019	2020	2021	Total
Participants	5	3	3	6	5	22
Non-participants	2	1	6	1	1	11
Total	7	4	9	7	6	33

One notable concern about these transcripts was that the interview-initiating questions were somewhat suggestive. For example, asking 'Do you prefer watching videos rather than reading text for the training method?' implied the facilitator's assumption that videos would be more preferred than text materials and hindered participants from giving opinions on other types of materials than those suggested. Such suggestive questions could prompt the purpose of the interview and frame responses to a specific limit (Allan et al., 2018). A better question could be, 'What type of materials do you think will help you learn RWP?' and suggest various examples of possible material types. Similarly, closed-ended questions, such as 'Was the training for the RWP intuitive and easy to understand?', sounded to confirm the facilitator's expectations rather than listen to participants' perspectives (Allan et al., 2018). If I reformulate the question for the present research, it could be an open-ended question, for instance, 'How was the training for learning RWP?'

Despite that, the scope and methods used for producing these transcripts seemed appropriate for the data collection required in defining requirements in many respects. At first, interviewing newcomers was a broadly used method to investigate the existing nature of onboarding tactics (Begel & Hemphill, 2011). Through the interviews, CM aimed to understand newcomers' needs and challenges in the previous organisational socialisation. The overall attitude of the facilitator shown in the transcripts was neutral and unbiased, despite the questions mentioned above. Additionally, the possibility that organisational dynamics limited the honesty of responses was low because the facilitator had no contribution to the previous onboarding activities, and his role was irrelevant to job assessments of anyone in CO. Moreover, this internal study recruited a significant number of participants corresponding to the two-thirds workforce of the branch. Considering the given time constraints of my research, I decided to use the transcripts as a data source providing the learner's perspective in identifying requirements to design training.

3.3.1.2. Organisational records on resigned cases

The transcripts were the data source reflecting completed onboarding activities. In other words, the consultants who provided the feedback were competent members of the organisation at the time of the interviews. However, previous studies found that newcomers tend to leave the organisation if they face severe challenges during their early entering period (Begel & Hemphill, 2011). To deepen my understanding of the nature of virtual onboarding regarding newcomers' learning of remote working tools, I collected data from organisational records on the newcomers who had quit before completing the onboarding process.

The sampling of cases was based on a survey CM sent to resigned workers. Through an online questionnaire, CM asked about the immediate reason for resignation, overall job satisfaction, and user-

friendliness of RWP in an open-ended question format. During the period the survey was sent out, between 2018 to 2021, there was a total of 36 uncompleted onboarding cases in which the newcomer could not start working as independent consultants until they left. Among them, six had responded to the survey and stated the reasons for their resignation. They left the company within the earliest 23 days and the latest 80 days since the start of the formal onboarding process displayed in Figure 3.

However, most responses were short, from a minimum of a word (yes or no) to a maximum of two sentences. Thus, I also collected data from RWP that could help understand the circumstance that influenced their resignation. RWP generated and stored the records on the progress of onboarding activities and internal communication during the period. Such found data provided insights into the resigned newcomers' learning of remote working tools in their onboarding activities.

The system-generated data mainly fell into two types. The first type of data was the logs of tasks performed by the consultants, which were the tutorial task during the second stage and the first few tasks for clients during the third stage. The task management function of RWP logged whether and when consultants completed each task and subtask. I retrieved these logs from the database using a business intelligence tool, Metabase. The second data type was internal communication records stored in RWP. The platform was the exclusive tool for internal communication and archived all written conversations as formal organisational records. It was an official policy to share the conversation logs internally for service management purposes. I collected the content of task-related conversations between the selected six consultants, their managers, and other supporting staff in CO.

3.3.2. Qualitative content analysis

My aim in the first study in phase 1 was to answer RQ1 by exploring the previous onboarding experience viewed from the newcomers' perspective, which was the reason for utilising *qualitative content analysis*. Qualitative content analysis is a research method to analyse texts using grounded theory (Johannesson & Perjons, 2021). The researcher takes the units of text, which may be words, sentences, or paragraphs, and develop codes according to the research questions (Johannesson & Perjons, 2021). In qualitative content analysis, the codes are not pre-determined but emerge gradually within the iterative work of categorising and revising the categories (Johannesson & Perjons, 2021; Mayring, 2014). The iterative revision ends when the researcher arrives at a reliable categorisation of the themes in the text (Mayring, 2014).

In the study carried out in phase 1, the units of text as clear semantic elements in the transcripts (Mayring, 2014). During the first step of the analysis, I took a hundred quotations relevant to the onboarding training. Then I developed the initial categorisation. It was two-dimensional categorisation, including the training content and methods perceived as frustrating or aiding factors to their organisational socialisation progress. By iterating the revision of categorisation, I classified the codes into ten categories at the end.

3.3.3. Case studies

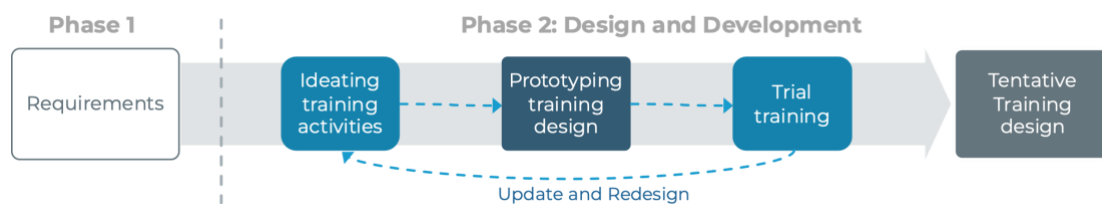
The second study in phase 1 focused on the six onboarding cases where the newcomers resigned before obtaining the qualification as competent members. I examined the relationship between their resignation and organisational socialisation regarding their learning of remote working tools. Using the case study method was a purposeful choice to obtain integral pictures of their organisational socialisation from the fragmented data I could collect at the time of the research. At first, the survey data was very limited in quantity because not every resigned consultant responded to the survey, also in quality, as responses were short in length. I analysed the communication and performance logs on RWP to reveal the considerable events and their context during the onboarding process to further the interpretation of the responses. For such a real-world case where multiple factors, events, and relationships coincide and interact, case studies can be a superior strategy to help researchers to view pregnant and detailed pictures of the problem (Johannesson & Perjons, 2021).

To further understand how newcomers' learning of remote working tools is related to their adaptation at the research site, I analysed each case focusing on three aspects. The first one was the expressed resignation reasons through the survey responses. Although the responses were relatively short, some clearly stated the aspects of onboarding activities that impacted resignation. I extracted and compared them with the circumstantial data. The second aspect was the tutorial training experience. Through the task and internal communication logs, I identified whether they completed the training, how long they took to complete it, and what happened after the training. I also looked for organisational records to explain why the tutorial training was incomplete or delayed. The third aspect was the performance of the first few tasks during the third onboarding stage. I focused on whether those tasks had any interruptions or delays. Also, any other issues around the newcomers and their first few clients. Finally, synthesising the findings from the three aspects, I identified these newcomers' learning of remote working tools in relation to their organisational socialisation.

3.4. Creative methods

The second phase of this thesis project was designing and developing the tentative training that can address the requirements yielded from research activities in Phase 1. In a DSR project, the activity of Design and Develop Artefact includes multiple sub-activities carried out in parallel and iteratively. It starts with initial ideas for a solution, goes through sketching and building, and finally arrives at a complete artefact (Johannesson & Perjons, 2021). There are many tools and techniques for supporting these sub-activities. In the following subsections, I will briefly introduce the creative methods and technological tools I utilised in phase 2 (see also Figure 5).

Figure 5. Phase 2: Design and Development



3.4.1. Newcomer Journey Map

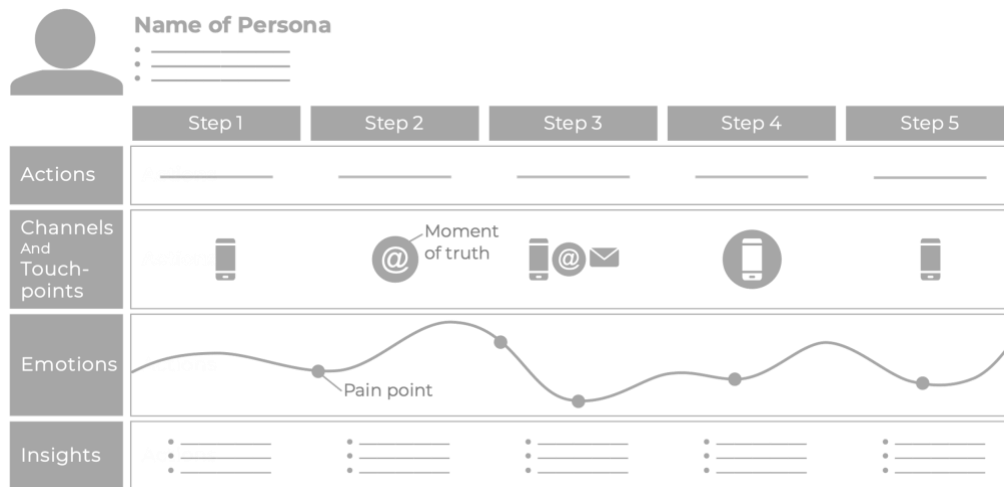
User Journey Mapping is a tool for idea generation by visualising the process by which a user interacts with a service or an artefact for achieving a goal (Johannesson & Perjons, 2021; Lewis & Sturdee, 2022). The first-hand outcome of using this tool is a user journey map visualising the experience an individual user goes through to achieve one's goal (Sperano et al., 2018). The map highlights a user's actions, experiences, and emotions while engaging in the focused practice (Johannesson & Perjons, 2021). Figure 6 shows the common elements of a user journey map. However, the depicted dimensions and formality level of the map may vary to consider the context of the project (Sperano et al., 2018).

User journey mapping allows a designer to generate ideas through empathetic thinking, that is, understanding the problem by seeing from the users' perspective (Johannesson & Perjons, 2021). Sperano et al. (2018) describe "the tool usually helps to point out the key interactions between the customer and the organisation and to identify gaps and pain points in order to uncover potential opportunities for innovation and for the creation of future experiences" (p. 966). It is also useful for building a common understanding of a problem from the users' perspective among designers and stakeholders (Gibbons, 2018).

I rephrased it to the Newcomer Journey Map for a better representation of the users in the context of this project. As its self-explanatory name, the map aimed to highlight the process of a newcomer in learning

remote working tools, from joining Agsney to becoming qualified as an independently working consultant.

Figure 6. Structure of a journey map



Note. The figure is modified from the figure “Structure of a journey map” in “Exploring new usages of journey maps: Introducing the pedagogical and the project planning journey maps” by Sperano et al. (2018).

3.4.2. Sketch and User story mapping

A *sketch* is an articulation of an ideated artefact. Making a sketch helps designers refine ideas, enables reflective communication among the stakeholders around the ideas, and guides the development of the artefact by outlining core functions and overall structures (Johannesson & Perjons, 2021). The format of a sketch can vary depending on the type of artefact. A sketch for a method often includes descriptions of activities or tasks, their sequential order and relationships between them (Johannesson & Perjons, 2021).

To create the sketch of the tentative training, a method of instruction, I utilised user story mapping, a visual representation of the relationships of functions using the user stories (Patton et al., 2014). The *user story* is the most prevalent tool in agile product development (Sharp et al., 2019). It is a straightforward method of sketching, describing each function of an artefact with a short and informal text written from the users’ perspective (Johannesson & Perjons, 2021; Patton et al., 2014).

User story mapping supports designers in organising user stories addressing the functions of the artefact following the user journey (Patton et al., 2014). For the current project, I used this method to determine an optimal training structure by organising dozens of sub-activities and visualising the order and linkages between them. Each story on the map represented a unit of learning activity (named a lesson) and contained clarification of content and instructional methods. Using the user story mapping method enabled my design process by outlining the specifications of learning activities and the overall structure of the tentative training. Also, it was used for communication with other practitioners for gathering feedback and learning resources.

3.4.3. Walk-through

The design and development activity requires making design decisions based on studying previous solutions and analysing new solutions (Johannesson & Perjons, 2021). *Walk-through* is a method to support designing and developing an artefact by clarifying and differentiating new design elements from existing solutions through a peer review kind of activity (Johannesson & Perjons, 2021). A designer leads participants through an artefact, and the participants, usually the development team members or

stakeholders, ask questions and point out possible improvements or potential problems (Johannesson & Perjons, 2021).

During phase 2, I held walk-through sessions with other practitioners to review the tentative training design. A regular one was repeated weekly during the latter half of the research period with the practitioner who was charged with employee development. Additionally, I held occasional sessions with the managers in CO to review subject-specific knowledge and practical procedures.

3.4.4. Trial training method

3.4.4.1. Prototyping and Think-aloud

Prototyping refers to building a prototype, a mock-up of the final artefact for gathering user feedback on a suggested design and testing its technical feasibility (Sharp et al., 2019). Evaluating potential solutions with prototypes is vital for the iterative design process of HCD (Norman, 2013). Regardless of its fidelity level, this method has decent value, creating the possibility of inspecting a design idea through the users' act of using the prototype (Johannesson & Perjons, 2021).

Accordingly, the next stage after prototyping is testing, where the designer gathers a few people and collects data on how they interact with the prototypes (Sharp et al., 2019). In principle, the participants should be people corresponding to the target user population and use the prototypes in an environment similar to the actual use situation as much as possible (Norman, 2013). While they use prototypes, the designer carefully collects data by observing them and asking questions. A frequently used technique to reveal what participants think and plan is the *think-aloud* protocol, asking participants to describe their feelings and behaviour explicitly.

3.4.4.2. Trial training

To assess the tentative training and refine requirements, I conducted three testing sessions, named trial training, because the participants tried the prototype training during the sessions. I invited three trainees who newly joined CM to participate in the trial training. Although their professional experience differed from the target users (i.e., consulting professionals), their level of knowledge in RWP was only subtly. Also, they had a work-related motivation to learn the platform, like the consultant newcomers. Their participation was distributed during the period of phase 2 while I continually updated the training design.

All sessions took place in a one-to-one video meeting environment as participants were scattered in different countries. Before starting each session, I informed and obtained consent about the testing purpose, video recording and the use of data for this thesis project (Appendix 8). While the sessions, I asked them to follow the think-aloud protocol and observed how they interacted with learning materials through their shared screen for about an hour. After that, I asked for their feedback about the training.

Trial training environments aimed to simulate the learning situation of the newcomers using training alone in a remote place. Participants tried the training activities individually at a place they used to work. I did not provide help or corrections while they went through the training, even if they misunderstood the training content. Nevertheless, there were unavoidable interventions of me as an observer during the sessions, for example, encouraging them to use the think-aloud protocol if they were silent for a few minutes. Moreover, the participants' behaviour could be influenced by their attitude toward the researcher who also developed the training design. As the influence of researchers in a direct observation method is a well-known drawback (Norman, 2013), I tried to emphasise the value of honesty as much as possible throughout the sessions. Also, considering participants may feel higher tension from being watched by multiple people while trials, I used video recording instead of having a second observer or a facilitator. After each session, I reviewed the videos and noted considerable observations and participants' speeches. These collected notes were used for redesign by reflecting on the feedback on the tested prototype of the training design.

3.5. Instructional design approaches

The artefact this DSR project aimed to produce was an online training design. To develop the instructional design of the training, I appointed a *constructivist* approach but combined the methodology of an *objectivist* approach.

There are several models for developing web-based instructional design, and the most broadly used approach to the instructional design process is the ADDIE model consists of five phases: Analysis, Design, Development, Implementation, and Evaluation (Lee et al., 2002). As an objectivist approach, the ADDIE model focuses on determining the most appropriate learning objectives and pursuing the best path for those objectives (Lee et al., 2002).

In contrast, constructivist models are derived from the perspective that individuals' existing learning experiences and knowledge influence their learning process (Lee et al., 2002). In constructivist models, determining the single best learning goal is no longer focal, and learners are the empowered agents setting learning objectives and controlling their learning path (Lee et al., 2002). Therefore, the constructivist instructional design fosters a reflective and recursive process in learners and provides context-based learning using authentic tasks and real-world cases (Lee et al., 2002).

In the practice of training design in business and industry, two approaches appear as a blended method rather than solely application (Lee et al., 2002). That is, combining the constructivist instructional principles while following the objectivist instructional methodology (Lee et al., 2002). This project also took this blended approach to develop the instructional design of the training. To design the training structure, I analysed required learning topics and then determined the best sequential presentation of the topics following the methodology of objectivist instructional design. Meanwhile, the training design aimed to present materials in situated contexts and provide a case-based learning environment.

In addition, it included formative feedback elements to encourage recursive learning. Formative feedback is a method of providing the assessment of learning outcomes that enable learners to determine the next steps to improve their performance (Wiliam, 2017). According to Wiliam (2017), Formative feedback requires “activating learners as owners of their own learning produces substantial increases in learning” (p. 180). Therefore, its nature coincides with the reflective characteristic of constructivist instructional design.

To deploy formative feedback in web-based learning environments more effectively, contemporary learning technologies have evolved toward providing automated feedback (Höhn & Ras, 2016). For example, retrievable self-testing, a quiz revealing correct answers to learners, and a self-review format are those. Such self-assessment tactics are frequently used to empower learners with ownership of their learning (Wiliam, 2017). I placed these learning activities in the training design to stimulate the reflective process in learners by providing formative feedback during virtual onboarding training.

3.6. Ethical considerations

This thesis project was based on the DSR framework. As a design science researcher, I sought to understand newcomers and develop onboarding practices at the research site where I worked as a practitioner while conducting the present study. During the five months of the research period, the main assignment of my job as a practitioner was the reconstruction of the onboarding process for new consultants. Having a dual role as a researcher and a practitioner is common for researchers in DSR projects, where they approach a real-world problem by designing new artefacts as alternative solutions (Johannesson & Perjons, 2021). Therefore, one important ethical consideration in DSR research is that the research results engage with people's work and life, and there are potential effects on people by using the artefacts (Johannesson & Perjons, 2021). This research aims at the public interest, not only the stakeholders' interest at the research site, that is, helping virtual teams develop effective onboarding training and, through that, eventually supporting professionals to be successful in their new job in remote

work environments. To ensure the research outcome serves the public interest, this study followed the ethical guidelines of Good Research Practice by the Swedish Research Council (2017) to the best of my knowledge. Also, I obtained an agreement from the company about publishing the produced knowledge with collected data at the start of the project.

Protecting participants' privacy is essential for gathering empirical data in social science research. As a measure to protect privacy, I pseudonymised and anonymised the names of people and the company itself when analysing the data as well as reporting the findings. Regarding the trial training participants, I noticed the research purpose and design and the use of collected data to them and obtained informed consent. Another concern was that the current study utilised the organisation's internal documents as a data source. CM agreed to use the interview transcripts and organisational records for this study under the condition of the anonymisation of the identities of the interviewees and the nondisclosure of confidential information. In addition to that, there were system-generated logs used to examine previously unsuccessful onboarding cases. Although it was official records internally shared for management purposes, individual workers could not realise the scope and details of such digital traces, also obtaining informed consent was problematic. For data protection, I retrieved data only relevant to the onboarding activities and anonymised the identities of workers by assigning serial numbers instead of names.

IV. Results

This chapter will introduce the process and results of this project, dividing them into two phases. In phase 1, *Define Requirements*, I focused on defining design requirements for virtual onboarding training by investigating previous organisational socialisation experiences from newcomers' perspectives. The first section reports the collected data and analysis results of two studies to answer RQ1 and suggests the training requirements derived from the analysis. The second section describes the activities in phase 2, *Design and Develop*. It presents the process and outcome of developing a tentative training design as well as refined requirements through the design process to answer RQ2.

RQ1: How is newcomers' learning of remote working tools related to their adaptation to virtual teams?

RQ2: What are the requirements when designing virtual onboarding training to support newcomers' learning of remote working tools?

4.1. Phase 1. Define requirements

4.1.1. Accomplished onboarding

To define the requirements of training design by understanding newcomers' learning of remote working tools in the entire virtual onboarding context, I inspected the virtual organisational socialisation experiences of the newcomers. I collected data from documents transcribing 22 interviews (T#1 to T#22) with consultants who completed the virtual onboarding training provided in the past. Using qualitative content analysis, I identified the training content and methods that helped them to adapt to their new job and defeat the limitations in virtual onboarding.

Table 4 displays the final categorisation developed as the analysis result, together with the number of occurrences within the transcripts (N of C), the number of different participants in which the categories had been coded (N of P) and their proportion among the total participants (% of P).

Regarding required content, many categories were related to task proficiency, particularly work practices performed on RWP. Four content categories are about the proper use of RWP applications for work tasks, except for C05. The next quotations portray troubles newcomers experienced before they built a good understanding of the RWP.

“It was about the way to turn on the timer with different things you did. I discovered that I had sat and worked a lot without being paid for it. But then I have not gone back again and looked at the training that (how to use the timer) is there either then.” (T#11)

The timer mentioned above refers to Timekeeping, the timesheet management system built-in RWP for automated billing. The learning process described here is that this consultant had made errors in using the timer and discovered them only in hindsight. Similarly, in the below quotation, another consultant told the experience of understanding the deadlines set in the task management system and the service quality control procedures connected to that.

“There was some work with these tasks. I also got a call from customer service that I had been flagged. There was probably something I had not realized about these deadlines and due dates that are inside the system.” (T#7)

Those consultants could join the company only if they had a certain level of experience in a specialized field. However, apart from being knowledgeable in their professional field, they also needed to understand the work arrangement embedded in RWP. The above quotations called attention to the need for opportunities to learn the specific work protocols required in task performances. In the next

quotations, consultants explicitly denoted the importance of understanding remote working tools during their adaptation.

“But the most important thing is when to use RWP because it is new to everyone, regardless of profession. The most important training is in RWP and our routines.” (T#12)

“... it was mostly getting to know the routines Agseny had. And that contact with customers is a bit special, it is only online, and I have never worked quite like that online, so it was a bit difficult.” (T#8)

Table 4: The categories of desired training content and method

Category	N of C	N of P	% of P
Training content	37	18	86%
C01. Understand RWP functionality : when to use and how to properly operate each feature	9	8	38%
C02. Other work-related software : training third-party applications that must be used	5	4	19%
C03. Performing tasks using RWP : workflow and routines to perform actual tasks on RWP	13	10	48%
C04. Remote client communication : technical and strategic tips for communicating with clients via video conferencing	5	5	24%
C05. Information about clients and service contracts : the characteristics of clients and the service spectrum	5	3	14%
Training method	63	20	95%
C06. Practical instructions : beyond conceptual information, step-by-step instructions on exact procedures of doing things on RWP	19	13	62%
C07. Developing proficiency in operations : practice materials to be proficient and confident in actual operations on RWP	10	9	43%
C08. Immediate and formative feedback : confirmation and correction of what has been understood at the time of learning	16	12	57%
C09. Learning by observing : opportunities to observe the process of operating features or performing tasks on RWP	7	5	24%
C10. Learning by trying : opportunities to try different features and work tasks on RWP and learn by doing and experiencing errors	11	7	33%
Total	100	21	100%

Regarding the required training method, I found that most consultants experienced difficulties learning and developing proficiency in practical operations. It was the overall commonalities in categories C06, C07, C09, and C10, even though each implied a different training approach. Many consultants mentioned lonely learning endeavours due to the absence of formal training or support.

“... we just have to start right away, even for the customers because we have to work, there is very little training.” (T#19)

“I’ve been there (the tutorial training stage) for a while but have done most of it myself.” (T#9)

Also, more than half of consultants reported that the feedback through digital means was limited and access to support during training was not easy. This data seems to support the existing finding that CMC in remote work arrangements hinders internal communication and organisational development (Croes et al., 2019; Hassell & Cotton, 2017).

Below, two contrasting experiences in internal communication show that proficiency in using CMC tools was cardinal in a fully remote working virtual team.

“You get an answer very quickly to that chat (the instant messaging function of the RWP) if there is anything.” (T#11)

“I did not even know that you could call (to the manager), ... When I was called, it was from a strange number (the universal number of the phone call routing system) that it was not possible to call back to, so it was very difficult to get through.” (T#3)

Because the RWP integrates all types of communication means, including instant messaging, email, audio calling and video conferencing, if a newcomer could not understand the system well, asking for help was also difficult. In other words, newcomers experienced communication difficulties differently depending on their capability developed through the learning of remote working tools.

4.1.2. Uncompleted onboarding

To gain insights into how newcomers’ learning of remote working tools is related to virtual onboarding from another angle, I investigated uncompleted onboarding based on the organisational logs of six resigned newcomers. I uncovered that four of them seemed to experience challenges in learning during the onboarding training (Table 5). In the other two cases, the resignations were unrelated to the training or for an unclear reason.

Table 5. Resignation cases and their relevance to onboarding

ID	Time until resignation	Training completion	Relevance to onboarding	Resignation circumstance
C#1	80 days	Completed in 19 days	Not clear	The newcomer delayed training and work assignments for unknown reasons.
C#2	29 days	Not complete	Immediately relevant	The newcomer complained about training in terms of written expressions and the length of materials.
C#3	31 days	Completed in 7 days	Somewhat relevant	The newcomer had not developed a good understanding of organisational rules, such as the deadline setup.
C#4	33 days	Not complete	Immediately relevant	The newcomer experienced IT trouble due to a malfunction of the firewall in the local environment during training.
C#5	56 days	Completed in 16 days	Not relevant	The newcomer could not have time to start this new job due to her/his personal situation.
C#6	23 days	Completed in 6 days	Somewhat relevant	The newcomer had not developed a good understanding of organisational rules, especially about Timekeeping.

Two cases (case ID C#2 and C#4) had not completed the tutorial training provided in the second stage of the onboarding program, and the resignation reasons seemed immediately relevant to problems within virtual onboarding training.

One of the cases (C#4) was a newcomer who could not complete the training due to a technical problem raised during an activity. The cause was the firewall deployed on the network system she used, but she had not obtained technical support at the beginning of the problem. Her survey response below showed she was positive about joining the company again in the future.

“Yes, please. If their IT systems do not cause trouble for my firewall.” (C#4)

This case indicated that virtual onboarding training should consider the technical diversity in remote places where newcomers work and pay attention to the technical complexity when determining online training tools. Also, it was an issue to provide an easy way to access technical support since getting immediate help from colleagues is challenging when they are working in remote places.

In another case (C#2) identified as immediately relevant to onboarding paused an issue related to training materials. The resigned newcomer mentioned insufficient written instructions and unnecessary long training when asked about the resignation reason. Although this single case did not allow a judgement on the content, it was also true that much of the training materials consisted of written explanations in a homogenous layout. Moreover, the system logs showed that this newcomer spent a month on the training and could not pass the summative assessment quiz at the end of the tutorial task. A possible guess reflecting this circumstance was that the training materials might not sufficiently deliver the necessary knowledge and practical information.

The two cases identified as somewhat relevant to onboarding (case ID C#3 and C#6) were newcomers who resigned after completing tutorial training within the given period, which was two weeks. After the tutorial training, the last stage of the onboarding program was demonstrating professional knowledge and skills by performing tasks for the first few clients under two times of performance review. In both cases, the expressed resignation reasons disagreed with the organisational rules.

“(about resignation) It comes to new tasks with short deadlines for completion ... (about RWP) it could have more options when, for example, postponing the opening call when the reason is that no assignment agreement has been written/posted.” (C#3)

“(about resignation) I want to work more independently ... (about compensation) (I) do not like the ‘stopwatch method’ ” (C#6)

These states implied their interesting misunderstandings about the organisational practices and functionalities of working tools. In practice, the initial deadlines were set based on the typical workload of each task, and consultants were free to adjust them by either updating deadlines (before the deadline) or giving reasons (after the deadline) within actual deadlines according to the service agreement. Similarly, the Timekeeping function, called the “stopwatch method” by the newcomer, was a means to ensure fair payment to consultants rather than performance monitoring. In fact, from the company’s perspective, the need for supervising work time was subtle as they charge clients for corresponding time to the minutes the consultants have registered.

The tutorial training materials regarding deadlines and Timekeeping functions imparted functional aspects shortly but did not convey examples in a practical situation or internal policies related to them. These circumstances implied that newcomers often could not develop sufficient knowledge of working practices through the training, which coincided with the solitary endeavour found in the completed onboarding cases. Such cases stressed that developing an accurate understanding of remote working tools is paramount in newcomers’ learning of the related organisational rules.

4.1.3. Design requirements

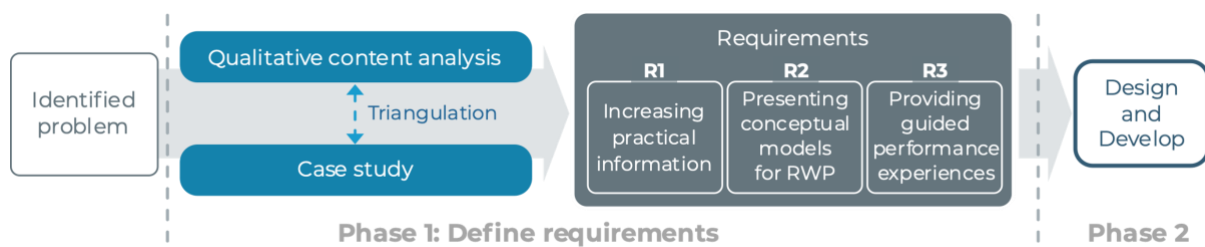
From the analysis conducted in phase 1, I derived the requirements to effectively deliver virtual onboarding training to help newcomers learn remote working tools. There were mainly three focused aspects: *increasing practical information*, *presenting conceptual models of RWP*, and *providing guided performance experiences*.

The first requirement (R1), increasing practical information, refers to enhancing training with comprehensive material about the practical proceeding of work routines as spontaneous observations or ad hoc support were limited, unlike in an office environment. In virtual onboarding lacking direct observation, it was essential to provide detailed information and visual materials demonstrating sequential operations on the graphic user interface (GUI).

The second requirement (R2), presenting conceptual models for RWP, means explicitly describing rational explanations of how and why the systems function. By doing so, training can help newcomers avoid misconstructions in organisational policies and accelerate the cognitive processes to build their understanding of the work environment.

Lastly, the third requirement (R3), guided performance experiences, refers to activities that allow newcomers to try essential features of RWP in doing low-risk tasks with definite guides. By providing such exercises, training can provide opportunities to learn by doing and get formative feedback on trials in a safer environment before actual work assignments.

Figure 7. The step of the defined requirements in the research process



Based on these defined requirements, I moved on to the next phase, designing and developing virtual onboarding training to support newcomers in learning remote working tools.

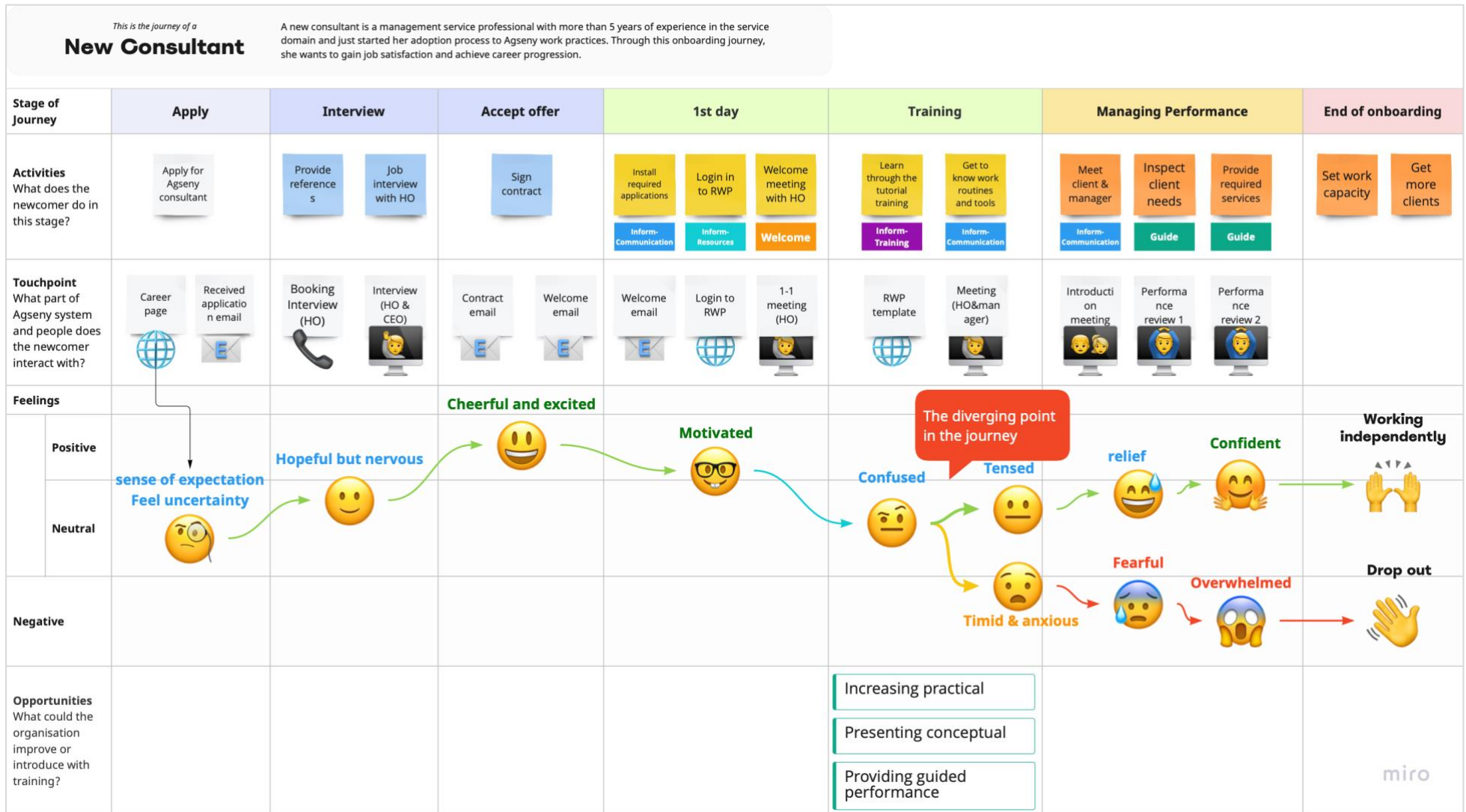
4.2. Phase 2: Design and develop

During the second phase, there were designing and developing activities to produce a tentative training design. The following subsections present the process of ideation, prototyping, testing and redesigning, together with the training design in development.

4.2.1. Newcomer journey map

To synthesise the analysis results and facilitate communication with other stakeholders working at CM and CO, I created the newcomer journey map using the user journey mapping method (Figure 8). The map focused on the virtual onboarding practices by visualising events, activities, interactions, and emotional changes from a newcomer's point of view. The practices used at the research site was identified following the IWG framework (Klein & Heuser, 2008). On the journey of newcomers' organisational socialisation, the critical event was the tutorial training placed at a divergent point in the journey toward becoming a fully participating organisational member.

Figure 8. Newcomer journey map



The benefit of using the newcomer journey map was two folds at the beginning of phase 2. Firstly, it fastened the goal of the tentative training design from the newcomers' perspective: to support the development of a systematic understanding of RWP's core functionalities and proficiency in practical operations, defeating limitations in virtual onboarding. Secondly, it urged other practitioners to recognise the connections between insufficient onboarding training and difficulties in previous onboarding cases. Such recognition of practitioners was important for leading their necessary participation in testing and reviewing the tentative training design during phase 2.

4.2.2. Initial ideas and prototyping

4.2.2.1. Training structure for addressing R1: Increasing practical information

To enhance the training in the coverage and detail of practical information, I first made an extensive list of required knowledge and skills that newcomers need to attain and collected resources to develop learning materials based on the existing training and interviews with managers working in CO. The list became the basis of the training structure shown in Table 6.

Table 6. The initial structure of the tentative training

Courses	Modules	Topics
Introduction to the training	Outline of training	How to use the learning platform, Introduction to RWP and training contents, and training supporting
1. RWP - your remote office	Basic features of RWP	Login and mobile access, profile setup, using essential features of RWP, such as tasks, ticket system, phone call smart routing system
	Scheduling and planning	How to plan daily assignments using various features of RWP, such as the dashboard, My week, Reports, Out of office.
2. Communicate with colleagues	Job & Roles	Service Agency offers, roles and responsibilities of different actors (consultants, manager, head of service, and customer centre)
	Tools for internal communication	Using communication tools of RWP: Chat, Ticket & Call, Forum, Information, Connect - Help centre
3. Working with clients	Client management - basic	Client acquisition process, service types and price, client payment policy
	Client Communication	Using client-related features of RWP, such as information, Note, Accept incoming call, and preparation of remote meetings
	Delivering service	Proceeding work assignments using RWP, Client folders, File library, sending ticket to client, sending client assignment requests, service level agreement (SLA), giving overdue reason, billing and work time registering
	Client management - various issues	Dealing with client issues (using the Help button): changing assignment agreements, changing service contracts, client relocation, client ratings, responding claims, end of customer relationships
Wrap-up	Wrap-up	Ready for next step: set up work capacity

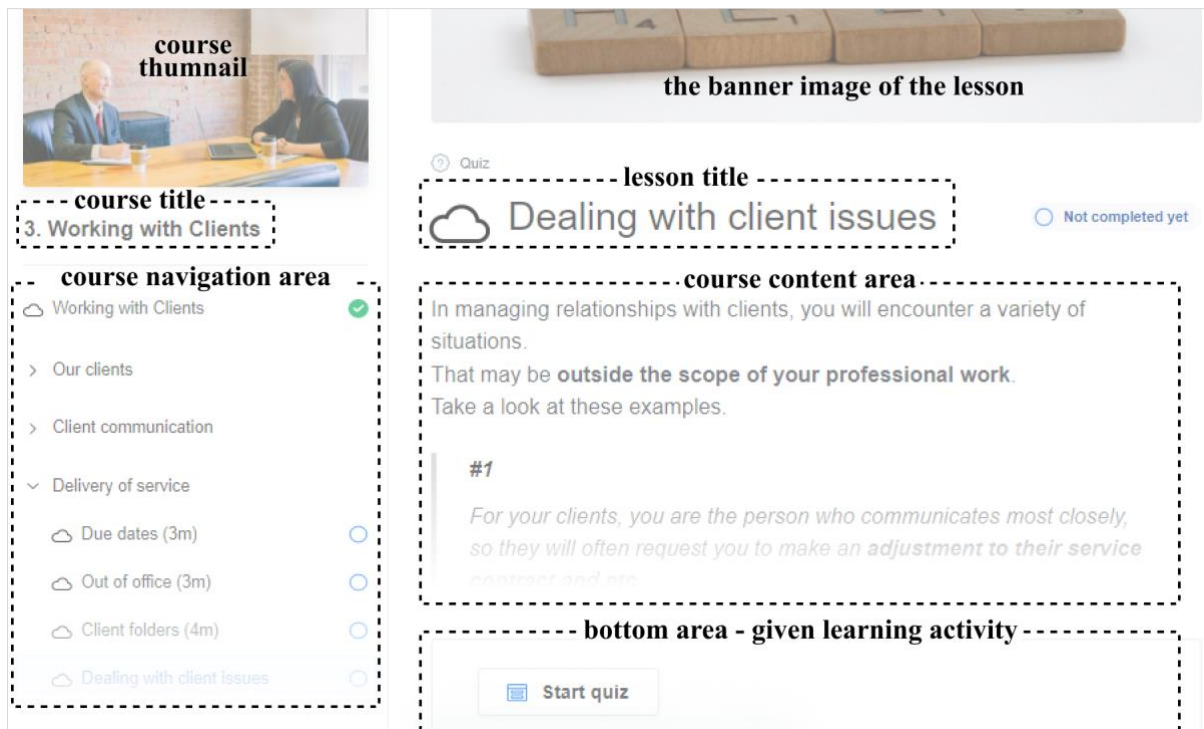
In detail, collecting the required learning topics followed three steps. First, I compiled learning topics through an extensive inspection of existing onboarding resources, including the materials used in the

existing tutorial training and the frequently asked questions list (FAQs) separately provided on an internal website. In this step, I excepted outdated content and attached new topics derived from the studies in phase 1. The next step was to consolidate similar contents and group closely related topics. While grouping topics, I considered the socialisation content dimensions suggested by Klein and Heuser (2008) as a guide and placed those topics in the same dimension under the same module. Meanwhile, I determined the learning goal of each course and the sequential order of the modules that fit the learning object. Lastly, I invited other practitioners to a session to review the preliminary list and interviewed them to supplement the details of the content.

The result assembled the required collected learning topics for three courses and forty-six lessons using the user story mapping method (Appendix 1 and 2). As summarised in Table 8, this initial structure was to start the tentative training with the introduction to learning topics and methods, have three main courses and sub-modules under them, and end with wrap-up activities. In this initial version, I placed self-assessment tactics at the end of modules so learners could review their learning progress before moving on next. Also, I noted various types of multimedia to be used in each lesson (the legend of Appendix 1 and 2). For instance, a lesson plan for using mobile access was guiding learners to practice mobile access with screenshots.

In this step, I selected a suitable online learning platform to comply with the idea of utilizing various multimedia materials. The platform selection considered available content layouts, for example, placing images, videos, and embedded objects together with text. The available types of learning activities were also an important criterion for providing formative feedback in an automated way. In addition, access to the learning platform should be easy from the newcomers' perspective, considering the technical simplicity of training. After reviewing several learning platforms, I chose a learning platform called Eduflow, considering available multimedia formats, learning activities and accessibility to the platform through RWP. Figure 9 portrays the basic layout of instructional materials on the platform.

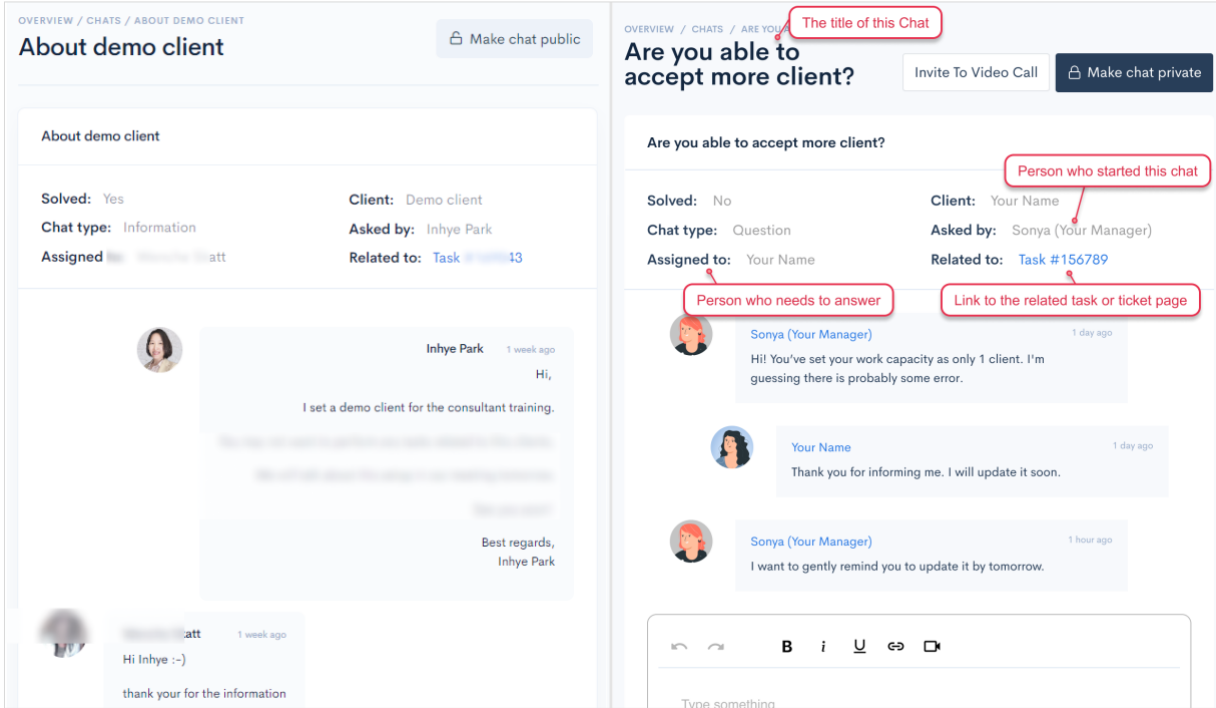
Figure 9. The layout of training content



Each course consisted of several modules, and a module was a group of lessons about correlated topics. Each lesson contained instructions and multimedia materials for the training topic. The development of instructions started with reviewing the previously used tutorial training content. Then I interviewed practitioners about the practical use context of the relevant remote working tools to include the procedures of operations in detail and contextual examples for each lesson.

For conveying the functionalities of RWP in each practical context, the tentative training used screenshots of GUI or animated GIF (Graphics Interchange Format) images representing the procedure alongside the text instructions. Lessons presented screenshots to depict the specific context for each topic, but I created most of them by capturing from the mock-up of RWP instead of the actual GUI. I used a commonly used prototyping tool, Figma, for creating a mock-up GUI to generate realistic mock-up screenshots. Figure 10 shows an example of mock-up screenshots in a tailored context for delivering practical knowledge. On the left, the screenshot of a chat taken from the actual GUI shows an internal conversation that is a little reverent to the training situation. In contrast, the simulated screenshot on the right portrays a realistic discussion related to the work capacity setting, which is also one of the training topics.

Figure 10. A screenshot captured from RWP (left) and the mock-up screenshot (right)



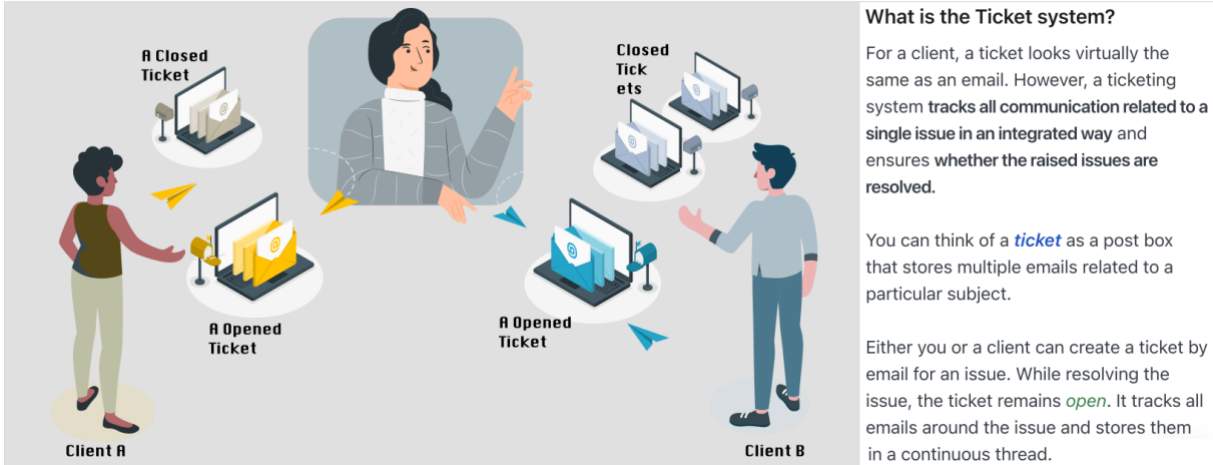
4.2.2.2. Training materials addressing R2: Presenting conceptual models of RWP

To clarify the concepts and systematic functionality of each remote working tool offered by RWP and their integration into work practices, I composed the instructions to include explicated explanations with text and visual materials. The central consideration in presenting conceptual models was avoiding unnecessary technical jargon because most consulting professionals were unfamiliar with business automation software. Instead, tentative training used straightforward expressions focusing on the core concepts of each system and illustrations and GIF animations visualising the abstract concepts.

One example of such a presentation is shown in Figure 11. The represented function of RWP in this illustration is a typical support ticket system, which is a system that manages and logs the communication between a customer who raised an inquiry and the customer support agents (Ali Zaidi

et al., 2022). Nevertheless, this function was one of the “new” or “special” things for the newcomers, according to the analysis of the transcripts conducted in phase 1. Considering those consultants who had not experienced such systems, the lesson content incorporated a written explanation of the functionality and an illustration, focusing on the structure of the ticket system and its behaviour by symbolising messages and ticket threads into paper aeroplanes and letterboxes. To create illustrations, I utilised a Figma plugin, Storyset by Freepik, that provides collections of illustration elements in different concepts.

Figure 11. The materials in the lesson for learning the support ticket system



4.2.2.3. Training activities for addressing R3: Guided performance experiences

To enable the tentative training to facilitate learning RWP by hands-on exercise, I developed demo systems mocking the platform’s actual user interface (UI) and behaviour. The demo systems were developed with Figma and embedded on the learning platform (see Appendix 3 for an example). Table 7 shows how each course contained these exercise activities.

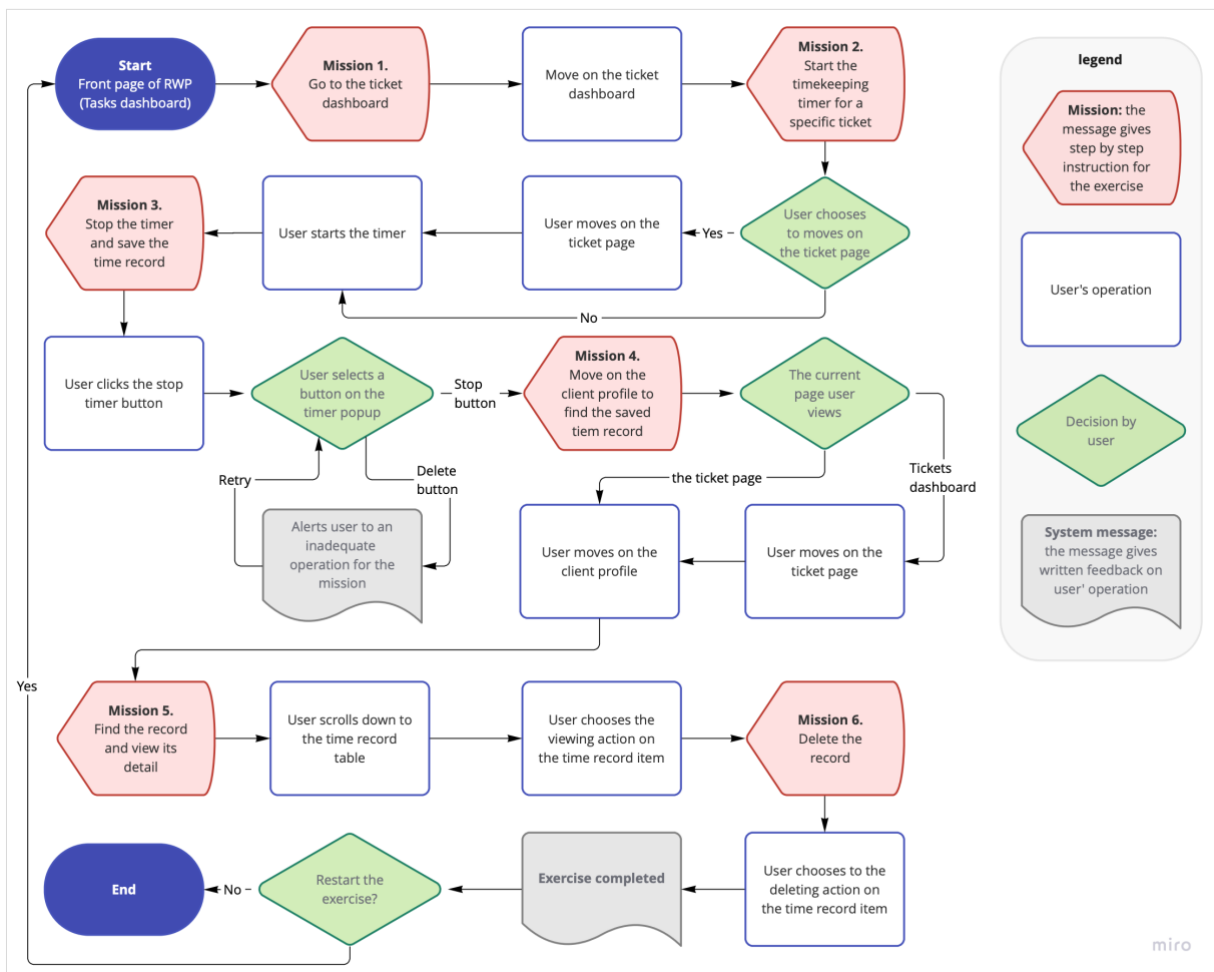
The reason for using demo systems was that the full functionality of RWP was only activated when consultants had clients. For example, the support ticket system and client profiles were unavailable until newcomers got their first clients. From the view of the socialisation content approach, it is desirable to give opportunities to experience key systems with low-risk tasks earlier before newcomers perform tasks for actual clients. Accordingly, the second module, “Communicate with colleagues”, did not use demo systems because newcomers could utilise the communication tools without limits during the training. In contrast, the first and third modules included multiple exercises using demo systems.

Table 7. Guided performance activities using demo systems

Courses	Modules	Guided performance activity
1. How we work at Agseny	Start working in RWP	My account
	Timekeeping	Timekeeping with Tasks
		Timekeeping with Tickets
	Tasks Management	Preview: Tasks
		Preview: Tasks dashboard
		Exercises: Tasks and tickets
Take a look at Reports		
3. Working with clients	Client Communication	Client information
	Delivering service	SLA & Overdue reason

Demo systems were also used to demonstrate the context where consultants usually operate several interdependent systems together. For example, one of the exercises for the timesheet management system (Timekeeping) guided newcomers in registering a work time record while working on a ticket, viewing the registered record, and deleting it (Figure 12). Through this scenario, this exercise aimed to demonstrate the standard work procedure for creating and handling Timekeeping work time records. In addition, newcomers could learn how RWP treats their work performance data while interacting with different systems, such as Timekeeping, the ticket dashboard, the ticket system, and the client profile.

Figure 12. The scenario of exercise for Timekeeping with tickets



As Figure 12 shows, each exercise had a scenario where a consultant performed sequential operations for a work assignment to help newcomers experience how the system behaves in practical contexts. The scenarios were based on professional conversations with practitioners working in CM and CO to ensure to include essential operations and frequent work procedures.

4.2.2.4. Applying principles of the constructivist instructional design

The tentative training combined the constructivist instructional principles while applying the ADDIE model to the design process. Accordingly, it had a liner structure designed for achieving learning objectives in each course, on the other hand, aimed to facilitate reflective and recursive processes through self-assessment elements and formative feedback.

Through the introduction course, *Your success mate, RWP*, I explicated the constructivist instructional principles to facilitate a desirable mindset in learners' minds. It first presented the goal and content of each course and entire training structure, then suggested utilising self-assessment activities such as retrievable self-testing (quizzes) to create a recursive learning path depending on individual progress. Lastly, it also provided multiple ways to ask for support with training.

The particularly emphasised guidance for quizzes and self-review was the below.

Quiz

- It is more important to understand the central concepts rather than memorise factual knowledge.
- Once you (newcomers) answer, quizzes immediately reveal correct and incorrect answers.
- You can retry quizzes as many times as you want.
- It is encouraged to go back to the module content, learn more and retry.

Self-review

- Self-review activities are for individuals' own learning, not for assessment.
- For each lesson, questions or incomplete sentences inspire you to rethink key content, for example, "*One thing I'm not sure about XXX is ...*".
- It is encouraged to check their review at the end of courses if any questions remain.

Following that, the three main courses placed quizzes and self-review at the end of each module to allow newcomers to check their learning progress during training. Also, the course wrap-up activity included a collection of quizzes again as a reminder of the course materials. Finally, each course gave instructions at the end to take up lessons again if they had not grasped related topics and encouraged newcomers to bring discussion topics in the one-to-one meetings with managers, which followed right after completing the training.

4.2.2.5. Revising structure of training

While the prototyping of the tentative training progressed, ideation continued in parallel, which led to the revision of the course structure through merging or splitting topics into different lessons. The revised training structure became four courses, including the introduction, three main courses, and forty-one lessons (Appendix 4). The modified training structure consisted of the lessons in a different order from the initial plan and placed quizzes and self-review activities.

4.2.3. Trial training and new requirements

During phase 2, I conducted three trial training sessions using the prototype of the tentative training. A combination of the think-aloud protocol, observation, and post-session interviews helped gather feedback about the usefulness of the training content and the usability of the training activities from the learner's perspective.

Overall, trial participants positively commented on the visual layout, the broad coverage of content, and the materials presenting conceptual models regarding R1 and R2. They reported that it was easy to understand how each system behaves and how to use features for work assignments by covering extensive and practical subjects alongside rich visual materials and contextual examples. Generally, participants reported that visual materials such as screenshots were more helpful than written instructions, as they delivered precise information about operations on GUI and the consequences of the operations. Especially, they evaluated animated images effectively demonstrated sequential operations.

Regarding R3, participants expressed satisfaction with the learning experience of the guided performance activities in demo systems. They commented interactive aspect and immediate feedback during practising helped them learn practical operations in RWP.

Meanwhile, the following significant observations and feedback led to refining each requirement and redesigning the tentative training.

4.2.3.1. Adjustment of learning materials per lesson regarding R1

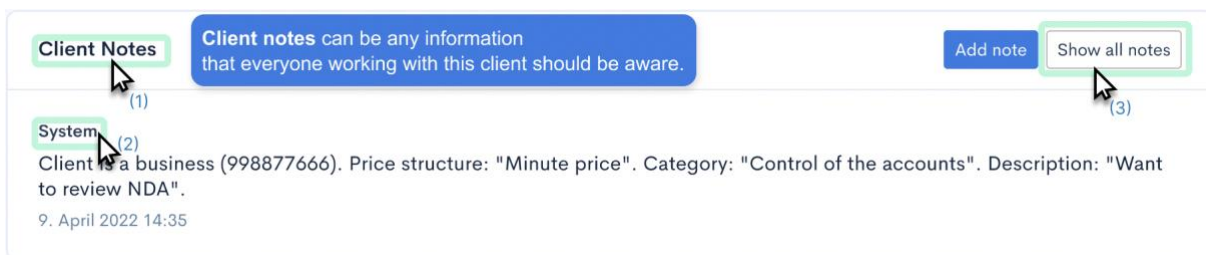
Concerning R1, each lesson in early prototypes of tentative training was designed to include extensive information on each topic. However, some lessons had mixed feedback about the amount of information. While learning with the same lesson materials, a participant felt they were text-heavy; in contrast, another commented that the explanations were straightforward and delivered sufficient information. This contrasting feedback seemed consistent when a lesson conveyed abstract concepts or technical aspects unfamiliar to the participant.

Such feedback implied that newcomers could feel more difficulty learning an unfamiliar subject. It was related to the findings from phase 1; newcomers often misunderstood uncommon systems, such as the timesheet management system and the support ticket system. In particular lessons, the amount of information should be adjusted to ensure that most newcomers can grasp the essential concepts. One approach was splitting lessons into smaller ones, for example, one for explaining the system's conceptual model and another for covering practical procedures.

4.2.3.2. Avoiding monotonous interaction regarding R1

In another case, the comprehensive materials conveying detailed information negatively impacted their attention to the main topic. It was found through considerable feedback on the exercise activities introducing the UI of each system. Figure 13 shows an example of these activities, requiring newcomers to hover the mouse cursor on the highlighted areas to find tooltips. The initial idea was to give information through interaction, but participants found it monotonous instead engaging when they needed to check many areas repeatedly. The participant who participated in the second trial training said, "The interactive exercise in the demo system was interesting, but I lost interest eventually when I had to check dozens of tips on the screen".

Figure 13. Initial design: showing tooltips one by one



4.2.3.3. Guiding exercise activities regarding R3

It was a repeating observation that participants did not discover the exercise instruction under the embedded screen showing interactive exercises. Participants tended to focus on only the screen displaying attractive visual materials. Although the instruction, "scroll down to see description", indicated affordable content under the embedded screen, it could also be confusing for the participants, as a participant tried to scroll down on the embedded content area instead of the lesson content area. Participants found it challenging to understand the goal of each exercise if they had not seen the instruction.

Another issue in using the demo system was finding the target operation in each step. The initial design of demo systems presented the required procedures when entering particular pages as a pop-up message. However, the message disappeared when the participant clicked the 'Okay' button as a confirmation.

The observation through trial training revealed that the required operations were too details to memorise. It gave insight regarding R3: In remote training, the completeness of information was critical for helping newcomers develop a holistic understanding. Therefore, the demo system should be able to guide the exercise activities without separate instructions and provide on-time instructions, not relying on users'

memory. Moreover, it required a more easy-to-use UI considering the newcomers would not be familiar with embedded content screens on a web page or the UI of the learning platform.

4.2.3.4. *Placing self-assessment elements near the learning content*

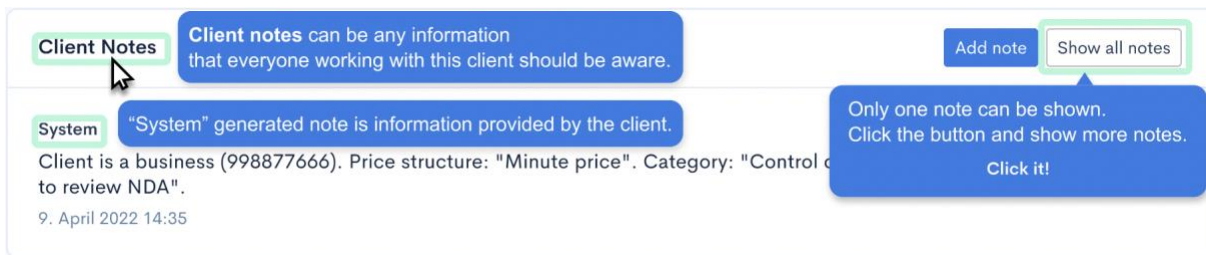
Lastly, it was found that quizzes and self-review would be more helpful if they were presented close to the related training materials. The first trial training participant wished to have the quizzes directly after each lesson to get help confirming her understanding and memorising the obtained knowledge. In the second trial training, another participant stated, “I was curious about something, but I forgot what it was”, while she wrote a self-review.

4.2.4. Redesign to address refined requirements.

4.2.4.1. *Avoiding monotonous interaction for addressing R1*

To present information in various ways to retain newcomers’ engagement, I modified demo systems to show a group of related tooltips together when users hover the mouse cursor over one of the highlighted areas (Figure 15). The third trial training tested this modified method and verified that this way of interaction reduced the feeling of repetition and helped the participant easily find the relationship between UI.

Figure 14. Modified design: Showing related tooltips together



Another tactic to avoid monotonous interaction was extending the exercise scenario so newcomers could navigate through important pages multiple times to get further information.

4.2.4.2. *Providing instructions in the demo systems for addressing R3*

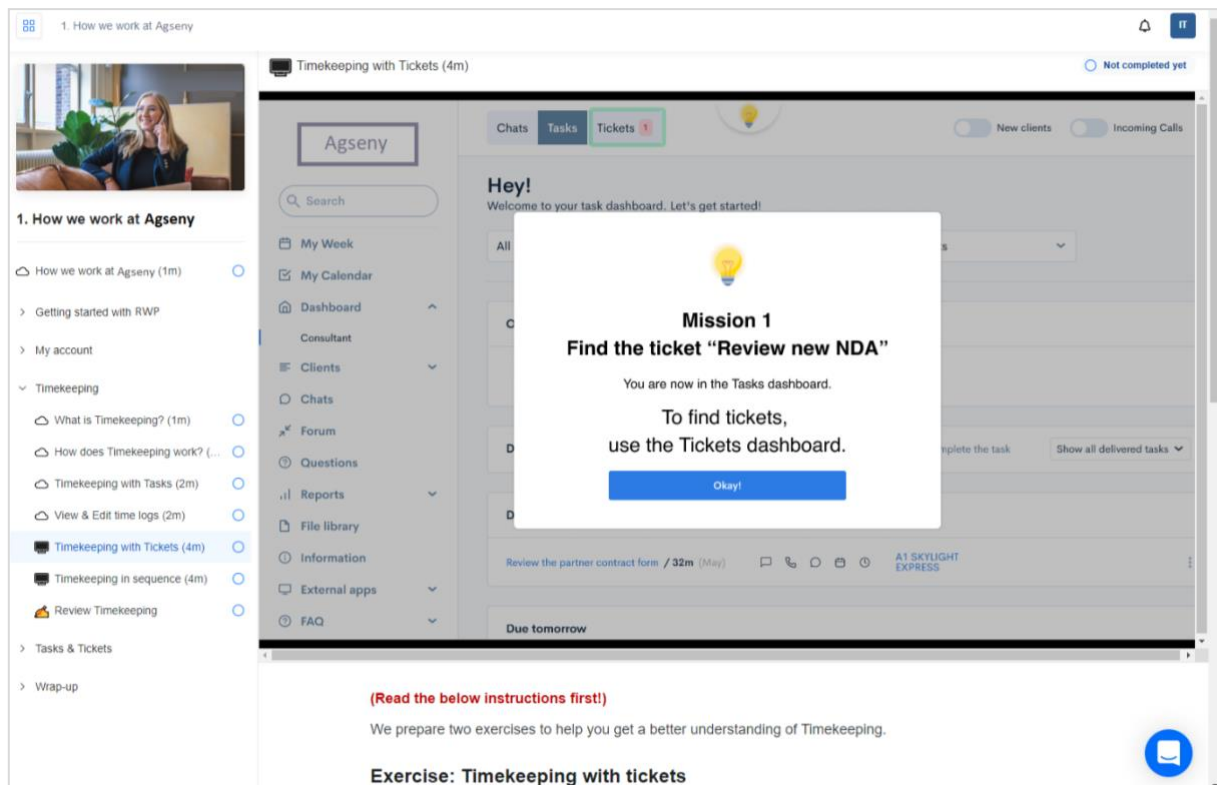
In the early prototypes, the instructions were shown under the embedded content screen, and newcomers could feel difficulty if they tried the exercise without discovering it. Even if they found it, they needed to scroll the web page up and down to check instructions during the guided performance activities.

Reflecting this finding, the modified training design included instructions for the guided performance activity in each demo system to provide definite guides. Modified versions showed instructions as popups messages in the activity flows and let users reload the message by clicking a lightbulb button on the top side when needed (see Figure 14).

In addition, the modified training design provided a lesson introducing how to use the mock-up systems, called Demo RWP here, before the first guided performance activity to help newcomers reduce errors in using them. It was also built with a demo system but had a simple linear scenario (see Appendix 5 for an example). Consisting of five pages below, it presented a short description and simplified UI images.

- What is Demo RWP: the basic UI of demo systems and the goal of exercise activities
- What to do: how to find instructions and show messages indicating the next step
- On-screen tips: how to discover more information by hovering the mouse cursor
- Scroll in Demo: how to scroll in the demo systems with different input devices.
- End of Demo: what to do at the end and how to retry the exercise

Figure 15. The modified exercise for Timekeeping with tickets



4.2.4.3. Guided performance in RWP for addressing R3

A broader modification was caused by introducing a demo client on actual RWP. Initially, guide exercises activities used demo systems because newcomers had not accessed any features related to client services until they completed training. In demo systems, the experience of RWP functionality was inevitably constrained as simulating all possible interactions was practically impossible due to the drastically increasing complexity of the scenario. During phase 2, I invited CM practitioners to review the prototype of the tentative training in the development and, through that, led a change in internal policy to provide a demo client for newcomers. Using a demo client allowed newcomers to try various features on actual RWP, meanwhile, avoid making mistakes in the task for real clients. Accordingly, new guided performance activities were developed using the demo client (see Appendix 6 for an example).

Despite that, I did replace exercise activities in Demo RWP with this method due to some advantages of them. One of the advantages was that demo systems enabled the exercise activities to guide how to operate specific work procedures, detect an incorrect operation and provide immediate feedback to newcomers. Meanwhile, guided exercises in RWP required learners to reflect when facing a different situation than the guide suggested. Therefore, it was more suitable for exercise to learn relatively simple operations so the newcomers could understand how the system behaves with a minimum guide and detect incorrect operations more straightforwardly.

Another practical consideration was that the guided performance on RWP would require more time to complete than those using demo systems because newcomers must continually switch between the learning platform and RWP. This aspect was observed in the last trial training session conducted in parallel with redesigning after the first two sessions. The third trial training participant said, *“Trying it in demo RWP seems easy. But in RWP, without guidance on screen, it is much more difficult.”* But, the participant also mentioned a positive aspect of the exercise using the demo client, *“It requires more*

concentration. Then, on the other hand, because there is no guide, it may be more helpful to remember what I did, what the procedure was”.

4.2.4.4. Restructuring lessons and modules

The training structure was reorganised to reflect the refined requirements. The reconstruction brought numerous changes in lesson composition, and in the end, the tentative training consisted of sixty-four lessons and activities, as shown in Table 8.

Table 8. The modified structure of training

Courses	Modules	Lessons	Courses	Modules	Lessons	
Your success mate, RWP	Training introduction	Your success mate, RWP	2. Communi-cate with colleagues	Introduction	Communicate with colleagues	
		Training Guide		People you are working together	Role and responsibilities	
		Training support		Chat & video call	Customer service	
		Leave training note			When to use Chat	
Mark as completed	How to create Chat					
1. How we work at Agseny	Introduction	How we work at Agseny		How to answer Chat		
	Getting started with RWP	Login & Security		Chats list & Chat feed		
		Reset password		Video Call		
		Mobile Access		Other internal communication	Forum	
	My account	My account		Information: Notification		
		* Demo RWP	Wrap-up and completion	Quiz: have you mastered it?		
	* preview: My account	Review this course				
	Timekeeping	What is Timekeeping	How does Timekeeping	Well completed this course!		
			Timekeeping with Tasks	3. Working with clients	Introduction	Working with clients
			View & Edit time logs		Our clients	Who are the Agseny clients
* Timekeeping with Tickets			Service types			
* Timekeeping in sequence			* Client profile			
Review Timekeeping			Client Notes			
Tasks & Tickets	RWP as Task manager	Comments				
	* Preview: Tasks	Billing policy				
	Custom task: Tutorial review	Client communication	Calling system			
	Template task		How to call			
	RWP ticket system		Timekeeping for calling			
	Ticket vs E-mail	Notification				
	* Preview: Tickets	Video meeting best practices				
* Exercises: using tickets	Delivery of service	Due dates				
Report		Out of office				
Wrap-up and completion		Quiz: have you mastered it?	Client folders			
	Review this course	Dealing with client issues				
	Well completed this course!	Wrap-up and completion	Quiz: have you mastered it?			
				Review this course		
				Well completed this course!		

(* Marked Lessons include exercise in demo system.)

First, splitting them into smaller lessons was required to aid learning difficulties in some lessons conveying abstract concepts and technical aspects of the systems. Reorganised modules started with a lesson explaining conceptual and abstract information and then followed those about practical

operations. Secondly, each lesson includes a small number of quizzes or self-review activities to facilitate more constructive learning. By this, self-assessment activity could be more immediate and specified for learning subjects. At the end of each course, where the quizzes and self-review were initially placed, wrap-up activities were suggested: the collection of quizzes provided throughout the course and a wrap-up self-review for leaving reflection on the overall course material.

V. Discussion

This research investigated how newcomers' learning of remote working tools related to their adaptation to virtual teams and defined requirements for designing virtual onboarding training to support their learning. In answer to RQ1, it was found that newcomers' learning around remote working tools intertwines their understanding of diverse socialisation content. Newcomers discovered and obtained knowledge and skills for organisational socialisation while learning to use remote working tools. Insufficient learning of remote working tools aggravated challenging conditions in virtual onboarding. Answering RQ2, three requirements of virtual onboarding training were found and exemplified by the tentative training design. Firstly, it has to provide practical information about comprehensive and detailed work procedures with remote working tools (R1). Secondly, it shall present conceptual models for remote working tools to explicate rational explanations of how and why systems behave in certain ways (R2). Thirdly, it needs to provide guided performance experiences that allow newcomers to develop proficiency in remote working tools by exercising in a safer environment with formative feedback (R3).

To discussing on these findings, this chapter has the following structure. The first section integrates and discusses key findings and their implications in accordance with the research questions. Following this, the second section describes the implications and recommendations for designing virtual onboarding training. Then, the third section discusses the potential limitations of the study. Lastly, it ends with remarks on the overall conclusion.

5.1. Integrating findings: significance and implications

5.1.1. Newcomers' learning of remote working tools and virtual onboarding

From the socialisation content perspective, the results of this study suggest the significance of newcomers' learning remote working tools to facilitate their adjustment to virtual teams. The findings imply that, as newcomers learn remote working tools, the developed knowledge and proficiency in technological tools contribute to gaining information, understanding their role, and making sense of circumstances in virtual teams. These cognitive processes contribute to their organisational socialisation, where individual professionals adopt the practices of their new role to become more productive members (Becker & Bish, 2021; Klein & Heuser, 2008).

To explain further, the understanding newcomers build through their learning of technical tools for virtual work becomes the basis of learning several dimensions of the socialisation content suggested in the multidimensional models by Chao et al. (1994) or Klein and Heuser (2008). Here, multiple socialisation contents, not only for task proficiency but also for rules and policies, structure, navigation, and working relationships, are intertwined with learning remote working tools in virtual onboarding. It is the organisational rules and values that give the rations of how to operate remote working tools. Attaining capability to navigate in IS means one becomes to understand the 'digital' layout of the work environment. Gaining ability to interact through CMC influences social and working relationships. The appropriate way of using tools is connected to understanding available resources and organisational policies. In other words, learning remote working tools could help newcomers build an understanding of the social and performance aspects of the virtual team.

Therefore, the present study poses a question of how to position the learning of remote working on socialisation content dimensions. While this question does not claim that this learning is a separate dimension of socialisation content, I believe that whether it should be seen as an outcome of organisational socialisation, a mediator, or an antecedent condition is a missing piece of the central knowledge for providing effective virtual onboarding.

Another aspect highlighted in the results is that learning remote working tools can be a factor that facilitates social interaction in the virtual onboarding experience. At the research site, newcomers' low

capability in using functionalities and insufficient understanding of remote working tools hindered them from gaining support and feedback from colleagues. This finding is in line with the typical challenges in virtual onboarding identified by Rodeghero et al. (2021). In relation to that, early on, Begel and Hemphill (2011) found that the invisibility of team members results in a deficiency of feedback in virtual onboarding.

However, in contrast with the previous studies viewing remote working tools as a pre-determined circumstance, the present study analysed the virtual onboarding challenge, viewing the technological aspect as a subject of learning during virtual onboarding. In other words, this study focused on the process of developing proficiency in using remote working tools to overcome the challenges of virtual onboarding. For the background reason, I want to note that the study paid attention to the tailored work platform at the research site due to the DSR approach, where a researcher examines phenomena through a real-world problem. When a virtual team utilise a tailored system, competence differences in technical tools between newcomers are lower than in those cases utilising applications in the market. Therefore, the competency in using remote working tools could be identified as a learning issue.

However, it is generally assumed that IS reflects the organisation's policy and work procedure (Blili & Raymond, 1993). As ICTs and IS play an essential role in collaboration and communication in virtual teams, I believe that organisational socialisation research should more actively investigate newcomers' learning of remote working tools to understand onboarding practice in remote work environments.

5.1.2. Virtual onboarding training for learning remote working tools

Regarding onboarding practices, the present study implies that those practices generally favoured in on-site onboarding could also have a persuasive effect in virtual onboarding. The Newcomer Journey Map highlighted that the formal training took a pivoting role in the onboarding process at the research site. Institutional practices such as step-by-step instructions were in high demand from the newcomers' perspective. These findings support the effectiveness of the Inform-training practices claimed by Klein et al. (2015).

Furthermore, this study suggested the Inform-training practices as a means to defeat challenges in virtual onboarding. Previous case studies on virtual onboarding by Begel and Hemphill (2011) and Carlos and Muralles (2022) highlighted that the essential use of CMC in virtual teams hinders direct observation during onboarding, so it causes the invisibility problem. What they recommended in common is explicating implicit information to transfer tacit knowledge. The R1 and R2 posed by the present study are in line with their recommendation.

As discussed in the above section, how to use remote working tools reflects work protocols and social aspects of virtual teams. Including extensive and conceptual knowledge about remote working tools in training will also explicate the nested tacit knowledge. R1 requests to deliver thorough and detailed information on it, and R2 claims the need to explain the rules and value that the tools reflect through the training.

Meanwhile, the R3 particularly focused on legitimate peripheral participation (Lave & Wenger, 1991) as an onboarding strategy based on the socialisation content approach (Gherardi & Perrotta, 2014). The findings of the present study depicted that access to remote working tools can constrain the opportunities for participation in practice in virtual teams and how virtual onboarding training can facilitate peripheral participation through the guided performance exercises under such a situation. From the situated learning perspective, this could be an inspiring model to devise guided performance activities as a tactic to facilitate legitimate peripheral participation through virtual onboarding training. Notably, the suggested method using a mocking system can efficiently guide standard procedures by constraining possible erroneous operations.

An interesting finding regarding experienced newcomers' learning strategies is that they tend to prefer other onboarding practices than those in the Guide category of the IWG framework (Klein & Heuser,

2008). This finding is inconsistent with the recommendations for virtual onboarding suggested by Britto et al. (2018), which outlined extensive mentoring as one of the recommendable virtual onboarding tactics. Considering that their study focused on software developers with various experience levels, the possible interpretation of this inconsistency is not singular. It could be another example of disagreement in onboarding practices among organisations, which organisational socialisation studies have widely observed (Klein et al., 2015). On the other hand, it may imply a variance in learning strategies among newcomers with different profiles. The present study focused on the newcomer population having a certain level of professional experience. As previously reported, this type of newcomer leans toward opportunistic strategies (Cooper-Thomas et al., 2012) and prefers empowerment in own learning more than newcomers in unmaturing levels do (Fenwick, 2012). The clearer answer probably lies in further broad studies with virtual teams in various industries and newcomers at different professional levels.

In addition, the tentative training design demonstrates how self-assessment elements can motivate recursive learning through virtual onboarding training. The exemplified training design aimed to deliver content in a fixed sequential structure following the ADDIE approach but also encouraged newcomers to determine their own learning path by repeating and returning lessons. Interestingly, this combined instructional design approach added an individualised dimension to the training assumed as an institutionalised practice (Begel & Hemphill, 2011; Van Maanen & Schein, 1979). Here I would highlight the similarity between the constructivist approach principles and the individual dimension. Moreover, these approaches could synergise with the learning strategies of experienced professionals, which is the typical profile of newcomers to virtual teams. In the following section, I will further discuss the connection between newcomers' characteristics and the combination of constructivist approaches in institutionalised practices for virtual onboarding training.

5.2. Implications and recommendations for designing virtual onboarding training

For the instructional design approach, this study employed constructivist instructional principles while following the ADDIE model approach. This choice was grounded in the characteristics of newcomers in virtual teams (Eldér, 2019; Lund et al., 2021) and supported by the experienced professionals' learning strategies suggested in prior literature (Fenwick, 2012; Tikkanen & Billett, 2014). This approach was particularly significant in the context of the research site of the present study, where newcomers were supposed to be at a mature level in their professional field at the time of entry. The findings identified that the newcomers tended to seek practical learning materials, opportunities to observe, and hands-on exercises. Accordingly, the present study reaffirms the distinct strategies of experienced newcomers suggested by Cooper-Thomas and Anderson (2002).

Further, the findings imply the viability of this combined instructional approach to virtual onboarding training. One of the methods for facilitating constructive learning was using quizzes and self-review to provide formative feedback. These are common tactics in web-based training (William, 2017) and are offered as easy-to-build learning activities on many online learning platforms (Höhn & Ras, 2016). The observations through trial training solidly agree with the principle of formative feedback suggested by William (2017); that is, providing formative feedback is not a matter of a tactic but a way of implementing it to empower a learner constructively using the assessment for her ongoing learning. Despite that, applying this approach in virtual onboarding training should consider that the research design of the present study did not aim to confirm the impact of the instructional design. I would call on rigorous academic studies on this aspect.

Although it is beyond the scope of this study to prove the potential of this combined instructional approach, the findings imply that newcomers' experience levels could be an important factor in virtual onboarding. Hence, future work could explore the relationship between newcomers' experience levels and the effectiveness of instructional approaches regarding virtual onboarding training.

From a DSR perspective, the findings of this study emphasise the effectiveness of the iterative design process of HCD in ensuring the viability of onboarding training design. Overall, the designing efforts toward a solution also allowed me to reflect on and refine the training requirements.

In addition, this project suggests the multiple advantages of a mock-up system in creating training content. Firstly, it can represent a realistic usage situation without exposing potentially sensitive information. Secondly, by using a personal pronoun referring to the newcomer herself, the exemplified situation can be presented from a first-person point of view. This way, the visualisation could help newcomers more easily recognise work relationships and organisational structure. Thirdly, the mock-up is suitable for creating tailored visualisations representing standard work procedures for the training.

Another noteworthy tactic was simulating the situated context in exercise using scenarios. According to the situated learning theory, organisational socialisation could be more effective with learning in the situated context (Gherardi & Perrotta, 2014). Although I utilised demo systems to provide the guided exercises, the same tactics could be implemented in an actual remote working platform in the form of a separate tutorial mode.

5.3. Limitations

As a limitation of the study, I acknowledge that collecting data about newcomers in the same occupation from one organisation may have limited its ability to triangulate data. Additionally, the distinct characteristics of the research site and the remote working platform may make it difficult to generalise the findings to other organisations, although this research tried to produce design knowledge based on practical problems as a DSR project. Future research may find it beneficial to include professionals in various fields or collect data from multiple organisations. Another limitation of my study is the small number of trial training, which limits the ability of the testing to verify the impact of the developed artefact. In addition, the profile of the participants in the trial training was also slightly different from the target learners, who were professional management service consultants who had newly joined the organisation. While I tried to instantiate a training design as an inspiration addressing the suggested requirements through developing the tentative design and evaluating it through the trial training, I acknowledge that substantial knowledge can emerge through the evaluation of the produced training design. Thus, the demonstration and testing of the training design would be a logical next step for future research.

5.4. Concluding remarks

To conclude, this study aimed to understand newcomers' learning of remote working tools concerning their adaptation to virtual teams and to produce knowledge in virtual onboarding training to support their learning. Based on the DSR approach using qualitative content analysis and case studies for research methods as well as multiple creative methods, it can be concluded that newcomers' learning of remote working tools is intertwined with their organisational socialisation. The results suggested increasing practical information, presenting conceptual models of remote working tools, and providing guided performance experiences for the requirements of effective virtual onboarding training. A tentative training design and its development were presented to exemplify an implementation addressing the requirements in practice.

This study implies the significance of newcomers' learning remote working tools in relation to the central process of organisational socialisation in which newcomers make sense of the surrounding environments of their new role in the organisation. The knowledge obtained through learning remote working tools could be the basis of learning socialisation content required in newcomers' early adaptation. The findings suggest virtual onboarding training as a possible solution to overcome the challenges of virtual onboarding. While the instructional design approach considering experienced newcomers was exemplified, it also raises the call for further validation on its impact. To better

understand the implications of these results, future studies could address the directional relationship between newcomers' learning of remote working tools and organisational socialisation outcomes.

Overall, my study contributes to understanding the complex aspect of newcomers' learning and their organisational socialisation in virtual teams and the onboarding training practice supporting the professionals joining virtual teams and providing the ground for future research on virtual onboarding training. Through that, the contribution of the study will benefit organisations that aim to facilitate practical virtual onboarding and individuals who further their professional work life in virtual teams.

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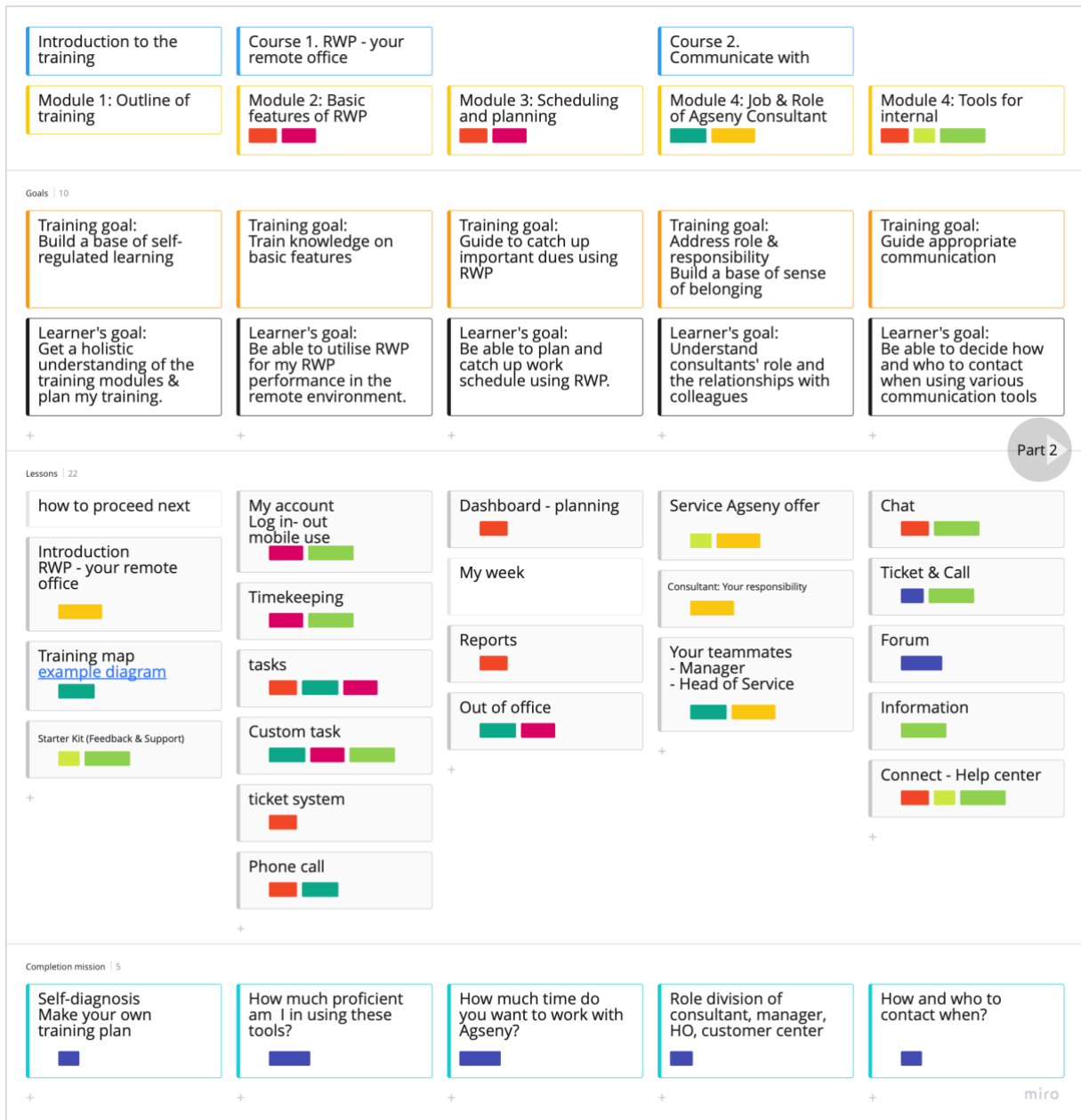
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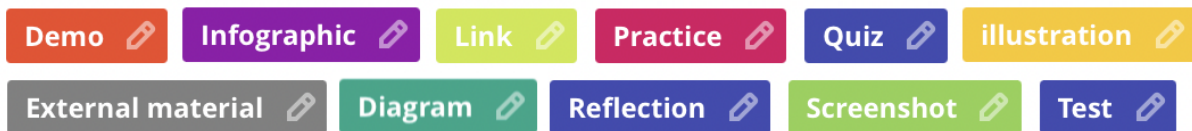
Appendix

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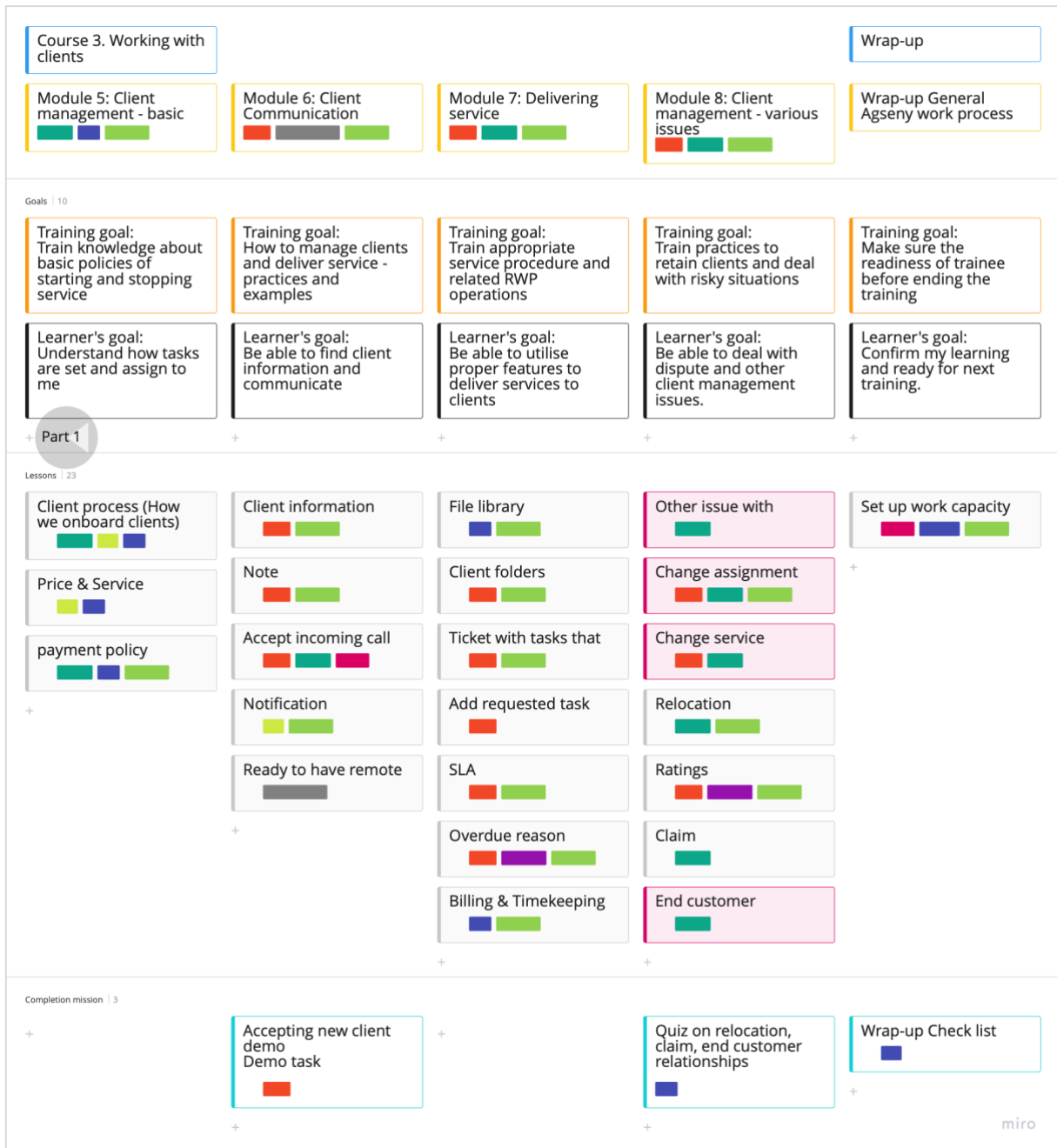
Appendix 1. User story map: the initial structure of the training (part 1)



Legend



Appendix 2. User story map: the initial structure of the tentative (part 2)



Legend



Appendix 3. An example of the embedded exercise activities in lessons

The screenshot displays a lesson interface for 'Timekeeping with Tickets'. On the left, a navigation sidebar includes a profile picture of a woman, the title '1. How we work at Agseny / test 1', and a list of activities: 'How we work at Agseny (1m)', 'Start working in RWP', 'Timekeeping' (with sub-items: 'Understand Timekeeping ...', 'Timekeeping with Tasks (...)', 'Timekeeping with Tickets', 'Quiz: Timekeeping (1m)', 'Review Timekeeping'), 'Tasks Management', and 'Wrap-up'. The main content area is titled 'Timekeeping with Tickets' and features a 'Not completed yet' indicator. It contains a ticket dashboard with sections for 'Overdue', 'Due today' (nothing due today), 'Due tomorrow', and 'Due in the future'. A specific ticket is highlighted with a blue callout box that says 'You can start the timer by clicking the timer icon'. Below the dashboard, a description box contains the text '(Scroll down to see description)' and 'We prepare two exercises to help you get a better understand about Timekeeping.' A blue chat icon is visible in the bottom right corner of the content area.

Note. The guided performance exercise is shown in the black frame on the content area of this lesson. The instruction for each exercise was placed underneath the embedded content area.

Appendix 4. The revised structure of the tentative training

Courses	Modules	Lessons	Courses	Modules	Lessons	
Your success mate, RWP	Outline of training	Agseny value chain	2. Communicate with colleagues	People you are working together	Role and responsibilities	
		RWP - your remote office			Customer center	
		Training map			Agseny connect - IT support	
		Feedback & support			Self-review: role and responsibility	
1. How we work at Agseny	Start working in RWP	Access RWP		Chat & Video Call	When to use Chat	How to create Chat
		Mobile Access				Chats list & Chat feed
	*My account	Video Call				
	Quiz: Start working in RWP	Quiz: Chat & Video Call				
	Self-review: the module			Audio Call	Smart Routing System	Using RWP for phone call
	Timekeeping	Understand Timekeeping				
		*Timekeeping with Tasks				
		*Timekeeping with Tickets				
	Quiz: Timekeeping		Quiz: Audio Call			
	Self-review: Timekeeping		Other internal communication	Forum	Information: Notification	
	Tasks Management	RWP as Task manager				Self-review: Communicate with colleagues
		*Preview: Tasks	Course wrap-up quiz			
*Preview: Tasks dashboard		3. Working with clients	Client information	Client onboarding process		
Tickets handling				Price & Service		
*Exercises: Tasks and tickets			Billing policy			
Report			Self-review: Client information			
*Take a look at Reports	Client Communication	*Client information	Note			
Quiz: Tasks management			Calling with clients			
Self-review: Tasks management			Video meeting with clients			
Course wrap-up quiz		Quiz: Client Communication		Delivering service	Set up work capacity	
					*SLA & Overdue reason	
					Out of office	
					Client folders	
				Other issue with clients: Help button		
				Quiz: Delivering service		
				Self-review: Working with clients		
				Course wrap-up quiz		

Note: * marked lessons included guided exercise activities in demo systems

Appendix 5. Demo RWP, the lessons for how to use exercise activities

OVERVIEW / DEMO RWP

What to do

What is Demo RWP? **What to do** On-screen tips Scroll in Demo End of Demo

Description

1. Instruction for the exercise.

Below the demo screen, there will be instructions for the exercise.

Please read the instructions first while the demo RWP is loading.

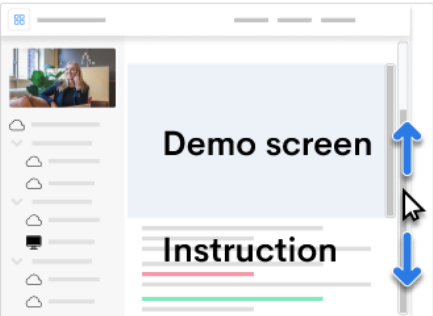
2. Missions in DEMO RWP

To help you understand sequential processes, Demo RWP gives you missions that you have to clear to move on next.

If you do not know what to do in a demo system, you can view the mission again

Did you notice there is a light bulb on this page, too? **Click and try the light bulb.**

And click the below 'Next' button to move on next.



Next

OVERVIEW / DEMO RWP


On-screen tips

What is Demo RWP? What to do **On-screen tips** Scroll in Demo End of Demo

Description

Demo RWP provides tips on the screen. To show these tips, Hover the mouse pointer over the highlighted area.

Sometimes, it will also guide you to click that particular place. You will need to explore another pages in Demo RWP following the tips.



Click the below 'Next' button to move on next.

Next

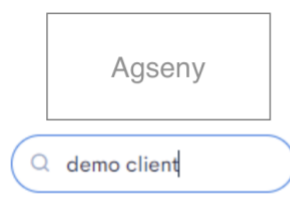
Appendix 6. A part of instructions for exercise with the demo client

Template task (5m)

Tasks can be created from a **template** that your HO designed for a repeating task.
To help you learn how to carry out template tasks, we prepared an exercise procedure.

Open TMS and follow the below instructions to add a template task.

1. Go to the client profile



If you know the client you want to add a task to, using **the client search box** is the easiest way to go to the client profile.

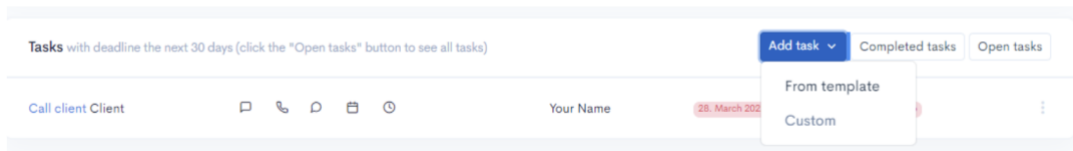
The client search box is located under the Agseny logo on the left-side navigation menu.

Type **"demo client"** on the search box and press enter to move to the client profile.

2. Add task button

In the client profile, there is the Tasks list that shows all ongoing tasks for this client.

Here, you will find the "Add task" button. It has two options.



3. Add a task from a template

Templates are designed following the regular process that the work should be done.

Therefore, exploring **template tasks** is a good way to learn the work routines that you will perform in the near future.

3-1. Choose "From template" to add a task using a template.

Click the **Add task** button and choose **"From template"**.

Then you will enter the page to create a new task.

Appendix 7. Resigned trainees' cases

Case ID	C#1	C#2	C#3
Started at	Q1 2019	Q3 2019	Q4 2019
Time until resignation	80 days	29 days	31 days
Time for training completion	19 days	not complete	7 days
Immediate reason for resignation	<i>"Overall rating"</i>	<i>"Too much unnecessary information and it took too long with the training process and I still had not started training the software"</i>	<i>"I want to be independent to manage my own working day. When it comes to new tasks with short deadlines for completion, I feel that I could just as easily have had a boss behind my back. In addition, there were reports of deductions from fees for postponements of deadlines, which I think is wrong as long as the fee is so modest in the starting point"</i>
Overall job satisfaction	<i>"Well, both"</i>	<i>"Do not get me started"</i>	<i>"no"</i>
User-friendliness of RWP	<i>"Something elaborate"</i>	<i>"It seems that Fiken is a simple program"</i>	<i>"Pretty good, could have more options when, for example, postponing the opening call when the reason is that no assignment agreement has been written / posted."</i>
Compensation satisfaction	<i>"No shaping"</i>	<i>"Not applicable"</i>	<i>"Think it was low. In comparison, I invoice between 600, - and 700, - to my own customers. I do not have my own office, and therefore mostly only payroll costs"</i>
Performance review	<i>"No comment"</i>	<i>"Not applicable"</i>	<i>"Received no"</i>
Comment on the company			<i>"I want more personal contact with my customers than I have the impression that it will be with Agseny"</i>
Resignation circumstance	The newcomer delayed training as well as performance tasks for the first two clients. CO determined the end of the relationship.	The newcomer complained about training in terms of written expressions and the length of materials.	The newcomer had not developed a good understanding of organizational rules, such as the deadline setup. In practice, the deadlines is initially set by general estimation, and consultants are able to adjust them.
Related conversation	Not found	Newcomer: <i>"I did not understand all the questions in the training test because it was written in poor Norwegian."</i>	Newcomer: <i>"I have come to the conclusion that the form of work in Agseny accounting is not suitable for me. As you can see from the clip below, I have a very short time to close accounts far back in time. As the accounts have not been maintained for more than half a year (for one of the customers), it is wrong to have a few working days to keep up to date. Especially when I received the latest documentation this weekend."</i>

* Continued Appendix 7. Resigned trainees' cases

Case ID	C#4	C#5	C#6
Started at	Q4 2019	Q4 2019	Q2 2020
Time until resignation	33 days	56 days	23 days
Time for training completion	not complete	16 days	6 days
Immediate reason for resignation	"Data trouble"	"No longer due to another job"	"I want to work more independently"
Overall job satisfaction	"I do not know. I only got to start the training program. My PC said there was a virus in the tutorial file and refused to download it. Therefore, I unfortunately did not advance in the training."	"Yes"	"Stopped too early to rate it"
User-friendliness of RWP	"Not so good, as my PC's firewall obviously did not cope with the tutorial. I had external IT help in two rounds. They said they could not help me ..."	"Very good"	"ok"
Compensation satisfaction	"Yes"	"All right"	"A little low, do not like the "stopwatch method"
Performance review	"I can not comment on that. I never got to work for you."	"Experienced both. Mostly fair."	"Not applicable"
Comment on the company	"(I want to work with Agseny again in the future) If their IT systems do not cause trouble for my firewall."	"Hardly have time (to work at Agseny)"	
Resignation circumstance	The newcomer experienced IT trouble due to a malfunction of the firewall in the local environment during training.	The newcomer could not have time for starting new job due to the personal situation.	The newcomer had not developed a good understanding of organizational rules, especially about Timekeeping. The time recording method is for fair payment rather than performance monitoring.
Related conversation	Newcomer: "Hey! I will not continue on the training due to a stop. Their program refuses me to drag the attachment to the box. Thus, I do not move on. My IT manager says it has something to do with the firewall, but does not find out."	CO staff: "... it was too much for him I think." (Description about personal incidence related family matter followed) "He said he was going to send dismissal but now it has been about 2 weeks."	

Appendix 8. Guide script for informing on the trial training

1. Thank you for helping me. The purpose of this trial training is to get your feedback on a prototype of the training design. This virtual onboarding training is designed in the context of new consultants joining Agseny to support their learning of remote working tools. The gathered data will be used for my thesis project, which is a part of the master's program in information technology and learning at the University of Gothenburg.
2. Knowing your feeling and opinion about the training are most valuable and helpful for the purpose of this testing. Also, remember, it is the training design I am testing through this session, not your learning or ability to use RWP. If you feel difficult to understand instructions or use something, it is not your fault but the training design. Please not be afraid to express your thoughts and feeling.
3. You will go through the training courses on the Eduflow platform for about an hour. Using this URL to access the course (provide the URL via the meeting chat for the participant).
4. While using the training content, please share your screen and tell me what you are thinking and feeling, what you are looking for, doubting, or curious so that I can follow along.
5. Imagine you are alone in your room for this training. Until you complete the courses, I will try not to intercept your learning. This means I will not be able to provide help or answer your questions about the training. But afterwards, when you are done, I will do my best to answer your questions.
6. You are free to move on next lesson at your own pace when you feel you have learned enough. You may skip any lessons or activities you do not want to go through.
7. Moreover, your participation is voluntary. You can quit during the session whenever you want. You may not respond to any of my questions if you do not want to answer.
8. For noting observations after the session, I would like to record your shared screen with your speeches. The video will be reviewed by me for note-taking purposes. After that, it will be deleted, and no transcripts will be produced. In my notes, any information possibly used to identify you will be removed or replaced with a dummy for anonymisation. Even after you consent to the recording, you can ask to stop it during the session or withdraw your consent at any time. Do you consent to the recording and proceed with the trial training following the informed method?

Appendix 9. Distribution of quotations following categories

Count	Transcript																				Total	
	Category	T#1	T#10	T#11	T#12	T#13	T#14	T#15	T#16	T#18	T#19	T#2	T#20	T#21	T#22	T#3	T#4	T#5	T#6	T#7		T#8
Training content		2	4	2	1	1		1	3	1	3	1		3	3	2	4	1	2	2	1	37
C01. Understand RWS functionality			1			1			1		2				1		1		1	1		9
C02. Other work-related software		1			1				2					1								5
C03. Performing tasks using RWS			3	1						1	1	1				2	1	1	1		1	13
C04. Remote client communication		1		1				1						1						1		5
C05. Information about clients and service contracts														1	2		2					5
Training method	6	1	4	6	5		4	1	2	3	2	1	3	3	4	2	5	1	2	5	3	63
C06. Extensive and practical instructions	2			3	1			1	1		1		1		2	1	1		1	2	2	19
C07. Developing proficiency in operations		1			1		1			1				1			2		1	1	1	10
C08. Immediate and formative feedback	1		1	2	1		2			1		1	1		2	1		1		2		16
C09. Learning by observing	2			1					1		1			2								7
C10. Learning by trying	1		3		2		1			1			1				2					11
Total	6	3	8	8	6	1	4	2	5	4	5	2	3	6	7	4	9	2	4	7	4	100

Appendix 10. Developed codes and categories of quotations

Transcript	Themes	Category	Summary of quotation
T#1	C06	Training method	find out things alone
T#1	C06	Training method	very little training
T#1	C08	Training method	Manager is not available go to customer centre or HO
T#1	C09	Training method	some observation with videos (not all through video)
T#1	C09	Training method	someone lead to learn (follow-up someone)
T#1	C10	Training method	Learn in practice (trying)
T#2	C01	Training content	ticket, tasks, overview
T#2	C01	Training content	general review of the system
T#2	C03	Training content	waiting for the customer on overdue -> suddenly lose the customer
T#2	C06	Training method	There is a lot to go through
T#2	C09	Training method	want to observe someone shows the practice
T#3	C01	Training content	How to communicate with colleagues
T#3	C05	Training content	Client contract
T#3	C05	Training content	Client introduction questionnaire
T#3	C06	Training method	lot of courses you had to go through
T#3	C06	Training method	Useful hidden features (not discover RWP functionality)
T#3	C08	Training method	workflow predictability
T#3	C08	Training method	there were only one-way communication
T#4	C03	Training content	How to start a day (work flow)
T#4	C03	Training content	different from other firm
T#4	C06	Training method	lack in training
T#4	C08	Training method	follow up during the first clients
T#5	C01	Training content	how to use personnel page
T#5	C03	Training content	Overview of service flow
T#5	C05	Training content	Client characteristics
T#5	C05	Training content	(the host company)'s client characteristics- client-SW
T#5	C06	Training method	not discover task system functionality early

T#5	C07	Training method	work in tight pressure but not sure doing good
T#5	C07	Training method	Starting first client - so many tasks, don't know the template flow
T#5	C10	Training method	Control over your own learning (not all video)
T#5	C10	Training method	functions handbook (dictionary)
T#6	C03	Training content	different from other firm
T#6	C08	Training method	Manager's role - Someone is always available for you
T#7	C01	Training content	check task due time
T#7	C03	Training content	takes time to know the system
T#7	C06	Training method	straightforward material
T#7	C07	Training method	Starting too quick
T#8	C01	Training content	visual cues to learn UI
T#8	C04	Training content	online customer relationships
T#8	C06	Training method	Have to manage on my own
T#8	C06	Training method	incorrect information
T#8	C07	Training method	Starting speed (multiple clients stressfull)
T#8	C08	Training method	easy and immediate help
T#8	C08	Training method	Need help to understand actual work processes
T#9	C03	Training content	control over the task flow (stop and pause)
T#9	C06	Training method	Figure out things alone
T#9	C06	Training method	take lot of time to do this
T#9	C07	Training method	Feel time pressure to complete
T#14	C01	Training content	Understanding file system
T#10	C02	Training content	training for other financial software
T#10	C04	Training content	First conversation(it is nervous)
T#10	C07	Training method	doing mistakes without safe zone
T#11	C01	Training content	timer
T#11	C03	Training content	Becomes complains (give wrong image to clients)
T#11	C03	Training content	things click exactly on the time
T#11	C03	Training content	timer - tasks relationship
T#11	C08	Training method	Chat - quick answer
T#11	C10	Training method	How to proceed, which emails, time spent

T#11	C10	Training method	let explore in the system and clients
T#11	C10	Training method	understand by actual working
T#12	C03	Training content	When to use RWP, our routines
T#12	C04	Training content	remote communication with clients
T#12	C06	Training method	frustration
T#12	C06	Training method	having to try and fail so much
T#12	C06	Training method	spend hours to learn the program
T#12	C08	Training method	How to learn
T#12	C08	Training method	Other than training
T#12	C09	Training method	focused classroom style learning
T#13	C02	Training content	needs (training subject)
T#13	C06	Training method	Incorrect link
T#13	C07	Training method	you could only have three mistakes
T#13	C08	Training method	get helps before starting with new customers
T#13	C10	Training method	rephrase
T#13	C10	Training method	Try and test
T#15	C07	Training method	Start with messy case
T#15	C08	Training method	Priority - Things need to be caution / and not
T#15	C08	Training method	someONE who can help you anytime and understand YOUR situation
T#15	C10	Training method	Learn by doing in the situation
T#16	C04	Training content	Communication with remote customer
T#16	C06	Training method	not much learned from training
T#18	C01	Training content	navigation to look at information quickly
T#18	C02	Training content	Check up software skills
T#18	C02	Training content	don't know specific SW (Fiken), started with Fiken client. get training later
T#18	C06	Training method	information is easy to get by searching and scroll through
T#18	C09	Training method	observation needed, but not for every subject
T#19	C03	Training content	completely new set-up
T#19	C07	Training method	start right away

T#19	C08	Training method	how to overcome challenges
T#19	C10	Training method	Learn through experience
T#20	C03	Training content	can't proceed due to the late response
T#20	C08	Training method	long time to get feedback
T#21	C06	Training method	too much time to learn so leave
T#21	C08	Training method	not able to call and ask someone
T#21	C10	Training method	get back and look again
T#22	C02	Training content	different financial software
T#22	C04	Training content	meeting first time
T#22	C05	Training content	frequent questions from customers
T#22	C07	Training method	a lot need to learn and start quickly
T#22	C09	Training method	learn by following step-by-step
T#22	C09	Training method	Learn in own phase