CHALMERS
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From New Hire to Team Member: Key Methods for Overcoming Onboarding Barriers

A case-study at *Boeing Flight Operations Implementation Department*

Master's thesis in Quality and Operations Management

ANTON GIEBAT
NATHALIE HÅLLVIK

DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
DIVISION OF INNOVATION AND R&D MANAGEMEENT

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NATHALIE HÅLLVIK

Examiner: Henrik Eriksson, Chalmers University of Technology

Department of Technology Management and Economics
Chalmers University of Technology
SE-412 96 Gothenburg
Sweden
Telephone +46 (0)31-772 1000

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Abstract

Onboarding is the process by which new employees are integrated into the organization and develop the knowledge and skills needed to become effective team members. The quality of onboarding processes impacts time to productivity, job satisfaction, and cost, making it a critical business process. How to achieve the desired onboarding quality in environments of high business complexity has received little to no attention in previous research. This master thesis has contributed to this research gap by analyzing how to improve the quality and efficiency of an onboarding process through a qualitative case study. The case study investigated the Case Company's current onboarding processes and identified possible barriers to learning. Lastly, the study analyzed and presented improvement initiatives to increase onboarding quality and efficiency. The studied department at the Case Company implements in-house developed IT systems for airlines globally, mainly employing engineers with higher degrees. Challenges regarding time to productivity and strain on mentors have been experienced within their onboarding processes. Both the talent program onboarding and regular onboarding process are built upon a mentorship program accompanied by courses. The study has identified and highlighted current barriers within the areas of business complexity, process variation, courses, mentorship, and socialization. With business complexity being the most significant barrier to becoming a productive team member, process variation impacts the possibilities of continuously developing the process, and socialization is one of the Case Company's strengths compared to previous research. Based on the identified barriers, some of the recommended initiatives for the Case Company include increased formalization of the onboarding process, striving for a mentee-centered learning approach, and involving new employees in customer interactions early. Firstly, a formalized onboarding process aims to provide similar conditions for success to all mentors and mentees by balancing standardization and adaptability. Secondly, Mentee-centered learning focuses on planning learning around each mentee. This could be done through increased digital course offerings complemented with workshops rather than prescheduled physical courses. Finally, customer interactions have been identified as one of the main experiences facilitating increased learning within business complexity. The case study further shows the impact organizational culture can have on socialization.

Keywords: Onboarding Process, Onboarding Barriers, Mentorship, Process Improvement, Business Complexity, Socialization.

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As the spring of 2024 comes to an end, this master thesis has come to its finalization. It is with great pleasure that we finalize the last project of our masters at Chalmers University Of Technology. The thesis has been a case study in collaboration with Boeing Flight Operations Implementation in Gothenburg.

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As we finalize our studies, we look forward to what the future holds for us. We are excited about the opportunities and challenges that lie ahead and eager to embark on the next phase of our careers.

Anton Giebat and Nathalie Hållvik, Gothenburg, May 2024

Contents

List of Acronyms

Below is the list of acronyms that have been used throughout this thesis listed in alphabetical order:

Acronyms	**Full Form**	**Description**
APAC	Asia & Pacific	Business region
CSO	Client Solution Owner	Project role
EMEA	Europe, Middle East, & Africa	Business region
EYW	Earn Your Wings	Talent program
KPI	Key Performance Indicator	Business metric
OSS	Open Source Software	Project type
PM	Project Manager	Project role
RQ	Research Question	Academic term
SE & AT	Software Engineering & Advanced Technology	Internal department

Glossary

Confluence: Web-based corporate wiki used for internal documentation

Crew Academy: Department managing internal and external course offering

FigJam: Collaborative web application for visualized brainstorming and planning

Skills Library: Digital platform for introductory videos and lectures

Jira: Tool for digital agile project management

Jira Tickets: Project tasks organized in the digital agile project management tool

Mentee: The employee being onboarded through a mentorship

Mentor: More experienced employee onboarding new employees through a mentorship

Rave: In-house programming language

Slack: Cloud-based tool for individual and group communication

List of Figures

List of Tables

1
Introduction

Onboarding is defined as "*the process in which new employees gain the knowledge and skills they need to become effective members of an organization*" (Cambridge Dictionary, n.d.). The onboarding process often further includes assimilation into the organizational culture (Davila & Pina-Ramirez, 2018). Onboarding can further be divided into general onboarding and role-specific onboarding, where general onboarding focuses on organizational culture, vision, and history. In contrast, role-specific onboarding focuses on learning specific capabilities needed in the new role (Davila & Pina-Ramirez, 2018). General onboarding has similar characteristics to the term Organizational socialization, which Bauer and Erdogan (2011) define as "*a process through which new employees move from being organizational outsiders to becoming organizational insiders*".

Graybill et al. (2013) Identify three factors that make the onboarding process a critical success factor for organizations. Firstly, it is the high investment in recruiting and onboarding new employees. This is additionally supported by Snell (2006), which states: "*Improving onboarding processes reduces time to contribution and prevents the potential costs incurred by poor onboarding*". Secondly, the authors identify the importance of the process in getting new employees up to speed. Lastly, an efficient onboarding process eases the transition to the new organization and makes new employees more engaged in their role (Graybill et al., 2013). This is also supported by Johnson and Senges (2010), who show that up to 90% of new employees decide if they want to stay long-term or not during the first six months. Moreover, this emphasizes the importance of establishing a successful onboarding. Research has shown that improving onboarding processes have positive effects such as decreased cost, increased job satisfaction, and improved time to productivity (Bauer, 2010; Bauer & Erdogan, 2011; Graybill et al., 2013; Snell, 2006), illustrated in Figure 1.1

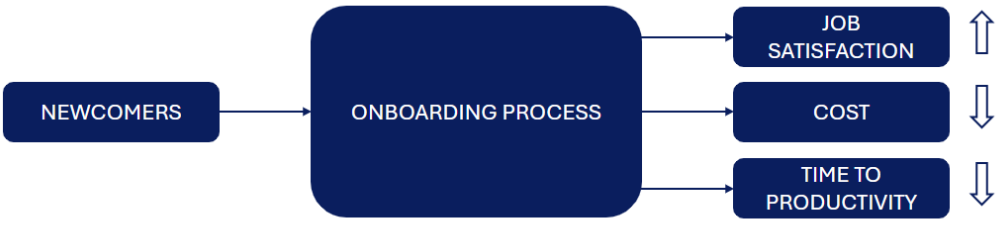

Figure 1.1: Illustration of onboarding and expected outcomes.

New employees' learning and development process can be divided into two phases: onboarding and continuous development; see Figure 1.2. The main difference between the phases is that onboarding focuses specifically on the new employees reaching productiveness, while continuous development, according to London and Sessa (2006), is needed on both individual, team, and organizational levels to remain competitive. The continuous development phase is an especially big part of the agile mindset (Mordi & Schoop, 2020), emphasizing the need for efficient onboarding in agile project teams to reach this phase as early as possible.

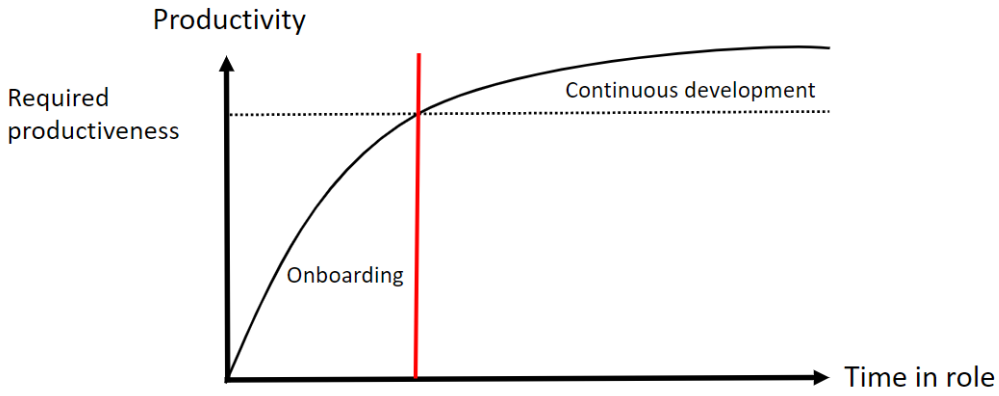

Figure 1.2: The distinction between the onboarding- and continuous development phase for new employees.

Integrating new employees into agile project teams faces additional challenges as they must assimilate into the organization and project team while not interfering with the progress of ongoing projects (Gregory et al., 2022). New employees must, therefore, develop technical skills and a business understanding of the current client. Thus, the role-specific onboarding difficulty and length are likely to correlate to the uniqueness of the project the new employee joins. Resulting in possible long lead times to reach productiveness and a strain on mentors during the onboarding process.

Previous research on efficient onboarding processes is mainly focused on general settings, with limited research on optimization for onboarding new employees to IT companies (Buchan et al., 2019). There is a further lack of research on onboarding processes where the development of complex multidisciplinary skills is necessary. Combining technical and business skills is increasingly important for future professionals (Tokarčíková et al., 2020), creating a need for onboarding new employees within both knowledge domains of the company's operations. This emphasizes the need for a study targeting holistic onboarding processes, focusing on both multidisciplinary skill development and social integration within the IT industry.

1.1 Purpose

The purpose of this master's thesis is to enhance understanding of onboarding processes within IT companies and evaluate methods and tools utilized for multidisciplinary onboarding. It aims to investigate the barriers associated with current onboarding practices and the acquisition of skills necessary for new employees to meet internal and client requirements effectively.

1.2 Research Questions

The following three research questions were formulated with the aim of fulfilling the purpose of this master thesis.

RQ1: *What processes are in place for onboarding new employees?*

The purpose of the first research question is to map the current processes and methods and tools used at IT companies to onboard new employees.

RQ2: *What are the barriers to learning associated with an onboarding process?*

The second research question aims to identify and analyze the root causes hindering learning within the onboarding process. It seeks to understand the challenges new employees face when acquiring the necessary skills and knowledge during their initial period at an organization.

RQ3: *What initiatives can be undertaken to elevate the quality and efficiency of the onboarding process?*

The third research question aims to identify actions that can improve the onboarding processes in IT companies over time concerning onboarding quality and efficiency. The goal is to identify ways of making onboarding faster and reducing the load on mentors without reducing the competence of onboarded employees.

1.3 Delimitations

The term "onboarding" contains numerous phases and activities to assimilate new employees or new-to-role employees to their new roles (Davila & Pina-Ramirez, 2018). This master thesis will focus on role-specific onboarding and socialization to understand the onboarding process from both mentees' and mentors' perspectives, excluding pre-hiring activities regarding recruitment and IT setups and continuous professional development from its scope.

Furthermore, this study will concentrate on the onboarding process from a more general perspective rather than exploring how it can be adapted to individual learning styles.

2
Theory

To better understand onboarding processes in the software development context, the following literature study was conducted. This study begins with an overview of definitions relevant to onboarding, offering a general perspective of the terminologies used. It is followed by an exploration of the methods and tools generally employed in onboarding processes, alongside the significance of mentors and mentorship programs. Thereafter, Barriers during onboarding in agile teams and OSS projects are presented. Subsequently, learning theories and their key characteristics and implications for onboarding are presented

2.1 Definition of Onboarding

Onboarding is defined as "*the process in which new employees gain the knowledge and skills they need to become effective members of an organization*" (Cambridge Dictionary, n.d.). In this paper, an effective member of an organization is defined as "*a person whose contributions to project deliverables do not need to go through additional quality checks by its team members*".

2.1.1 Onboarding Quality and Efficiency

Onboarding quality targets both socialization as presented by Bauer and Erdogan (2011) and the role-specific onboarding highlighted by Davila and Pina-Ramirez (2018), to cover the desired outcome of onboarding processes holistically. Onboarding quality is thereby defined as "*The degree to which new employees are assimilated to the organization's unique culture, and acquire the knowledge and skills needed to become effective members of the organization*". Onboarding efficiency focuses on the effort needed to achieve this onboarding quality, defined as "*The amount of resources needed to achieve the desirable onboarding quality*".

2.2 Onboarding Process

The onboarding process, also referred to as "organizational socialization" in literature (Bauer, 2010; Van Maanen & Schein, 1977), is a process composed of both formal and informal activities to integrate new employees into a team and to help them transform from being an "organizational outsider" to becoming a productive team member and "organizational insider". According to Sim and Holt (1998), the

process of new employees becoming organizational insiders and value-adding may take 6 to 12 months. To become an organizational insider, the new employee needs to gain organizational knowledge, develop skills, and understand the organizational culture such as norms, rules, and traditions (Sharma & Stol, 2020).

To achieve a successful onboarding Bauer and Erdogan (2011) highlights multiple organizational efforts that play a crucial part in the process, such as socialization tactics, formal orientations, realistic job previews, and organizational insiders. These four, in combination with clarity in the role specifications, introduction to the organizational culture, and gaining acceptance from colleagues, are necessary to become an organizational insider. Buchan et al. (2019) further pinpoints the importance of team and leadership support as well as socialization during the onboarding.

The organizational model presented by Bauer and Erdogan (2011) draws insight from Van Maanen and Schein (1977) six dimensions for organizational socialization and Jones (1986) two-dimensional model. Van Maanen and Schein (1977) describes organizational socialization with the following six dimensions: (a) collective versus individual socialization, (b) formal or informal, (c) sequential or random training steps, (d) fixed or variable sequencing of training, (e) serial or disruptive tactics in terms of insider help with adjustment and (f) investiture or divestiture. After that, Jones (1986) reduced the six dimensions into a two-dimensional model focusing on institutionalized and individualized onboarding. The author describes the significant differences between new employees undergoing an individual and more informal onboarding process and those integrated through a formal and structured group orientation. Studies have shown that collective onboarding, where newcomers go through onboarding activities and acquire experiences together, generally results in higher satisfaction and success compared to individual onboarding (Bauer & Erdogan, 2011; Britto et al., 2018, 2020; Cawyer & Friedrich, 1998; Sharma & Stol, 2020). It is further shown that the organizations with the most successful onboarding processes use more formal onboarding programs (Bauer, 2010). The increased formalization creates increased standardization and decreased process variation, facilitating continuous improvements of the onboarding process.

2.3 Onboarding Methods and Tools

Onboarding processes can be designed and structured in multiple ways, depending on the company and its preferences. Buchan et al. (2019) study of effective team onboarding in agile software development, list different methods and tools that can be utilized in the onboarding process; see Table 2.1. A method is defined as an activity performed, while tools are physical or digital means of support.

Table 2.1: Onboarding methods & tools.

Methods & Tools	Description	Category
Checklist	A checklist to assist with remembering aspects of work and tasks.	Tool
Code Review	With peers' help, review and analyze code, both one's own and others.	Method
Internal Documentation	Documentation of internal knowledge of data structures, codes, algorithms, guides, and projects.	Tool
Mentorship	Given an assigned experienced team member as a mentor for face-to-face meetings, guidance, and support.	Method
Online Communities	Using online communities for support with specific technical questions.	Tool
Pair Programming	Develop code together with a mentor or peer at one workstation, learning from senior expertise.	Method
Product Overview	Internal documentation that showed the functionality and features of products and business values.	Method
Team/Peer Support	Ad hoc opportunities to ask peers or other team members for information, guidance, and support. This also includes observations of work methods.	Method
Team Retrospective	Review projects and their challenges, learning with the team and drawing insights from their challenges and learnings.	Method
Training Courses	Attendance of formal courses to achieve specific learning objectives or certifications related to work tasks. It also includes online courses.	Method
Simple Task	Do tasks that are low risk and technically feasible, provide experience with programs, tools, processes, technology, and team norms.	Method
Socialization with Other Teams	Face-to-face interaction with other teams within the organization, including other departments.	Method
Stand-Up	Have regular stand-up meetings with the team as described in Scrum or similar methodology.	Method

2.3.1 Mentorship

Mentorship was identified by Buchan et al. (2019) as one of the most significant techniques for creating a successful onboarding. Mentorship is commonly used to help guide and support new employees in learning role-specific knowledge and becoming acquainted with informal aspects, such as culture and norms. Previous literature defines mentors as individuals with advanced experience, knowledge, wisdom, and skills who can provide support and advice to promote and develop the careers of their mentees through an interactive relationship (Bauer & Erdogan, 2011; Eby et al., 2007; Ju et al., 2021; Mullen & Klimaitis, 2021). Furthermore, Ghosh (2013) describes that mentorship can be characterized in a supportive manner in terms of making friends, promoting the mentee for projects and tasks, protecting in challenging settings, and motivating and inspiring in new tasks. However, Ghosh (2013) emphasizes the importance of challenging the mentee, letting them be critical towards their performance and deliveries, and evaluating their self-development. These characteristics are to some extent similar to DeJovine and Harris (2001) "best practices" for mentors to develop an effective relationship with the mentee: create a safe environment, listen without judgment, agree on objectives rather than approaches, and appreciate differences.

Hamlin and Sage (2011) examined crucial behaviors for mentors and mentees to create an effective mentorship relationship; the study's primary finding is that for optimal outcomes in mentoring relationships, the personal characteristics and behaviors of both mentees and mentors are of equal importance. According to the authors, acquiring the necessary knowledge and skills to be a mentor or mentee generally requires structured learning or guidance. Therefore, mentors conducting management and leadership programs before becoming mentors is crucial to give them the best prerequisite to creating an effective and successful relationship with their mentees (Hamlin & Sage, 2011). Hegstad and Wentling (2005) and Wanberg et al. (2003) further outline the characteristics of a conducive organizational culture for mentorship success, highlighting the importance of "top-level" support, employee collaboration & engagement, cross-functional teams, and development network. Following the previous statement, Bauer and Erdogan (2011) also stresses the importance of engaging existing employees in new employees' onboarding processes to create a successful onboarding. Mentorship is considered an effective and efficient onboarding technique to help new employees become value-adding and autonomous (Buchan et al., 2019; Sharma & Stol, 2020). Mentors are generally more senior employees at the company, Davila and Pina-Ramirez (2018) recommends that the mentor has over three years of previous experience within the company to give the mentee the best prerequisites for their onboarding process.

2.3.2 Methods

Code Review

Code review systematically analyzes the existing code, helping newcomers understand the existing code base design and coding standards while learning new techniques (Buchan et al., 2019). McIntosh et al. (2016) emphasizes the importance

of formal code inspections improving the quality of delivered code. Code review is performed by a third-party team member, who reviews the quality and structure, ensuring it meets the requirements.

Pair Programming
Pair programming is the practice of two programmers working together on the same computer. Their responsibilities are divided into the roles of "driver" and "navigator", where the driver writes the code and the navigator performs a real-time review (Hulkko & Abrahamsson, 2005). Pair programming is argued to improve productivity, code quality, knowledge transfer, and learning while simultaneously resulting in higher satisfaction among programmers (Banić et al., 2023; Hannay et al., 2009). However, there is currently no consensus among researchers regarding the effect of pair programming. Hannay et al. (2009) and Hulkko and Abrahamsson (2005) highlight a lack of evidence that pair programming would be universally beneficial for productivity or quality. Hannay et al. (2009) highlight potential biases towards pair programming as a possible reason behind the tendency to neglect challenges inherent in adapting pair programming. One such challenge is the increased need for coordination and its associated cost (Bird et al., 2022; Hulkko & Abrahamsson, 2005). While opinions on pair programming's impact on productivity or quality are scattered, it is shown that pair programming facilitates increased learning among both students and programmers (Hanks et al., 2011; Hulkko & Abrahamsson, 2005).

Product Overview
A product overview is an introduction to the company's projects or product portfolio, aiming to give the new employee a better understanding of the business context (Buchan et al., 2019). Helping the new employee understand the bigger picture and the connection between tasks and company deliveries makes it less ambiguous (Ju et al., 2021)

Simple Task
Simple tasks were identified by Buchan et al. (2019) as a crucial element for new employees to familiarize themselves with their work and to assess their knowledge gaps. These tasks, which are of lower difficulty and have limited effect on team deliveries, provide a straightforward introduction to the organization's work methods. Simple tasks could be bug fixes or configuration settings (Ju et al., 2021).

Socialization with Other Teams
Organizational-wide socialization is described by Buchan et al. (2019) as gatherings or team celebrations, such as sharing a lunch, celebrating a project, or sharing a cake for a team member's birthday. The author stressed that socialization is a key aspect in gaining trust and respect both in one's team and across teams. Additionally, Gregory et al. (2022) highlight that gaining trust helps new employees to become more confident. Socialization is an important aspect of the work to keep team trust and cohesion.

Stand-Up
Stand-ups are daily, short "time-boxed status" meetings that everyone in the team participates in (Gregory et al., 2022). Moreover, this method is an effective way to give and receive feedback, and as a new employee, it's an opportunity to get daily support and ask questions. Furthermore, it is an opportunity for the team to reflect on the current work, learn from mistakes, and identify improvements (Buchan et al., 2019).

Team/Peer Support
Ju et al. (2021) has found that team support is a critical method regarding learning during onboarding. Support from fellow team members is crucial for answering questions, explaining work aspects, and assisting with tasks (Buchan et al., 2019). Trust from team members further helps the new employee become more confident in their role and tasks (Ju et al., 2021).

Team Retrospective
Team retrospectives allow the team to reflect and review challenges and learnings after every sprint and learn from them (Buchan et al., 2019). The retrospective covers obstacles, feelings, previous actions, background reasons, and plans (Andriyani et al., 2017). Buchan et al. (2019) additionally stated that this meeting helps the new employees better understand how the team thinks and works, and is a safe forum to ask questions.

Training Courses
Attending courses to learn about an organization's key technologies and ways of working is an important method for onboarding (Buchan et al., 2019). This can be achieved through formal courses offered by the organization or through self-directed learning initiatives undertaken by the new employees. Buchan et al. (2019) emphasizes the importance of receiving a formal introduction course, which helps to understand policies and organizational procedures.

2.3.3 Tools

Checklist
A checklist is a tool utilized to assist with remembering important aspects of work and tasks to execute (Buchan et al., 2019). The author further explains that a checklist is useful for keeping track of upcoming tasks during the onboarding. Moreover, it was expressed that a checklist could be utilized to structure what points to look for in following and understanding code.

Internal Documentation
Internal documentation captures local knowledge about data structures, algorithms, and company-specific details (Buchan et al., 2019). All documentation is stored and saved in internal databases for organizational access. It was also identified as one of the most important tools when onboarding new employees. Knowledge databases can be one example of internal documentation, making information about

coding, testing, requirements, work procedures, development tools, and security, and organization-wide information such as policies and organizational structure easily accessible (Buchan et al., 2019).

Online Communities
Online communities imply forums or stack overflows where the new employee can search for or ask technical questions. Ju et al. (2021) found that a dedicated channel or forum to ask questions about their work, helped new employees to have a more effective and successful onboarding.

2.4 Onboarding Barriers

Published research regarding onboarding barriers in software development is scarce. There has been extensive published research on onboarding new employees into open-source software (OSS) development projects, as well as barriers associated with knowledge sharing and learning in agile software development projects. In an agile working environment, Babb et al. (2013) highlight the barrier to knowledge sharing across teams, as each team works independently on their projects. Moreover, in a project-based organization where teams operate as autonomous units, there may be a lack of regular contact between colleagues in different project teams (Scarbrough et al., 2004). Babb et al. (2013) has further identified that low customer interaction is a barrier to knowledge sharing and learning. Employees given more hands-on contact with customers and products get a better understanding and become productive faster (Dagenais et al., 2010). Additionally, remote work has become more standardized since COVID-19, although studies show that remote onboarding causes difficulties regarding information retrieval (Petrilli et al., 2022). There are further increased challenges with social integration between teams and normative learning during remote onboarding processes. Rodeghero et al. (2021) emphasizes that remote onboarding is more challenging compared to on-site, new employees expressed challenges with socialization and connecting with other team members, in addition asking for help and natural contact with teammates was not as easily performed for new employees. Research has identified three main barriers within agile software development projects: knowledge sharing between teams, Customer interaction, and remote work.

Secondly, research regarding barriers for newcomers in OSS development projects has been thoroughly investigated. Steinmacher et al. (2014) has compiled barriers identified by previous research and compiled all barriers into a model, see Figure 2.1. The primary onboarding barriers are social interactions, newcomers' previous knowledge, code issues, finding a way to start, and documentation issues.

The main barrier identified by Steinmacher et al. (2014) was social interactions, including the challenge of socializing with other project members, receiving timely and proper responses, and finding proper expert help and mentors. If the newcomer receives a good mentor, the chances of retention are higher. The second barrier focuses on the newcomer's previous knowledge, meaning lack of domain experience,

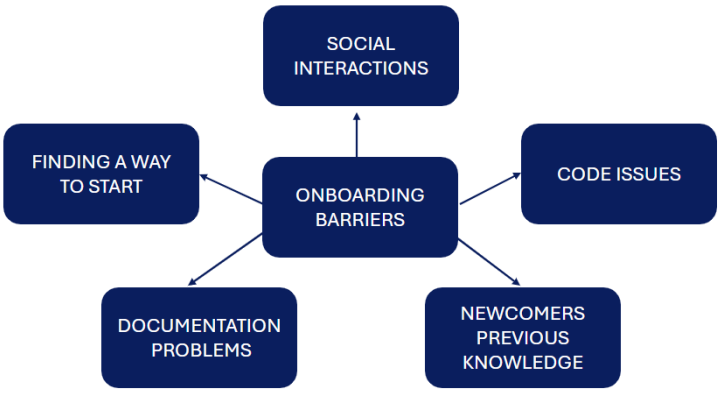

Figure 2.1: Onboarding barriers within OSS-projects, adapted from Steinmacher et al. (2014).

technical expertise, and limited experience from the processes and practice. Previous research furthermore states that newcomers' unfamiliarity with domain knowledge can make the onboarding of newcomers arduous (Balali et al., 2018; Fichman & Kemerer, 1997). Thereafter, Steinmacher et al. (2014) identified finding a way to start as a barrier. Moreover, coming into new settings with new communication channels and scattered information is overwhelming without guidance. The fourth barrier identified is associated with the code base. Code complexity and understanding a project structure and local workspaces can be challenging for newcomers. Park and Jensen (2009) reported that providing the new employees with visualizations of the information would help them understand the existing code. Lastly, documentation problems were identified by Steinmacher et al. (2014) as a barrier. This barrier addresses potential issues of outdated documentation, information overload, and unclear code. This is further emphasized as a challenge when working remotely (Rodeghero et al., 2021). Both authors have reported newcomers experiencing challenges with uncertainty due to outdated documentation. Furthermore, an extensive amount of data is stored and documented, and this has been described as difficult to navigate (Rodeghero et al., 2021).

Moreover, Balali et al. (2018) further investigated barriers faced in OSS projects from a mentor and mentee perspective and identified barriers associated with the process structure and time management. Firstly, mentors have expressed that it is hard to introduce everything to the new employee since there is no standardized process. The lack of a standardized process complicates the onboarding of new employees (Balali et al., 2018). The author further states that the lack of standardization makes it hard to identify appropriate tasks that will help the new employee learn effectively and not become overwhelmed by the complexity. Secondly, time management was identified as a barrier for mentors, where Balali et al. (2018) stated that allocating time between projects, reviewing code, and mentoring is challenging without a clear process. All barriers identified in the literature are displayed in table 2.2.

Table 2.2: Onboarding barriers compared to literature, where the authors acknowledging the barriers are listed in the columns.

Barriers	Agile Teams	OSS
Business Complexity	-	(Balali et al., 2018; Steinmacher et al., 2014)
Code Issues	-	(Steinmacher et al., 2014)
Documentation Issues	-	(Rodeghero et al., 2021; Steinmacher et al., 2014)
Finding a Way to start	-	(Steinmacher et al., 2014)
Knowledge Sharing	(Babb et al., 2013)	(Steinmacher et al., 2014)
Low Customer Interaction	(Dagenais et al., 2010)	-
Mentorship Related	-	(Steinmacher et al., 2014)
Newcomers Previous Knowledge	-	(Balali et al., 2018; Fichman & Kemerer, 1997; Steinmacher et al., 2014)
Process Variation	-	(Balali et al., 2018)
Remote Work	(Petrilli et al., 2022; Rodeghero et al., 2021)	-
Socialization	(Babb et al., 2013)	(Steinmacher et al., 2014)
Time Management	-	(Balali et al., 2018)

2.5 Learning Theory

Learning has been studied from many different perspectives, resulting in numerous learning theories being developed over time (Stewart, 2021). From historical philosophical perspectives of behaviorism, where the focus was on the importance of observations and reflections, in the early 20th century, theories focused on formal education with a front-of-class teacher and a standardized learning approach, and more recently, theories have moved more towards a learner-centered approach to learning (Stewart, 2021). Some of the most influential learning theories are behaviorism, cognitivism, and constructivism.

Modern holistic learning theories are built upon combinations of behaviorism, cognitivism, and constructivism to describe learning in their environments (Ahmad et al., 2020). The experiential learning theory is one modern holistic learning theory

appropriate for complex environments where learners have high cognitive maturity (Ramburuth & Daniel, 2011).

2.5.1 Experiential Learning Theory

Experiential learning theory defines learning as "*The process whereby knowledge is created through the transformation of experience*" (D. Kolb, 1984). The author further states that "knowledge results from the combination of grasping and transforming experience" (A. Kolb & Kolb, 2011). The experiential learning cycle, as seen in Figure 2.2, is therefore visualized as an iterative process with different methods for grasping and transforming experiences into knowledge. The model's two methods of grasping experiences are through concrete experiences and abstract conceptualizations, while the transformation of the same experiences is done through reflective observations and active experimentation (A. Kolb & Kolb, 2011).

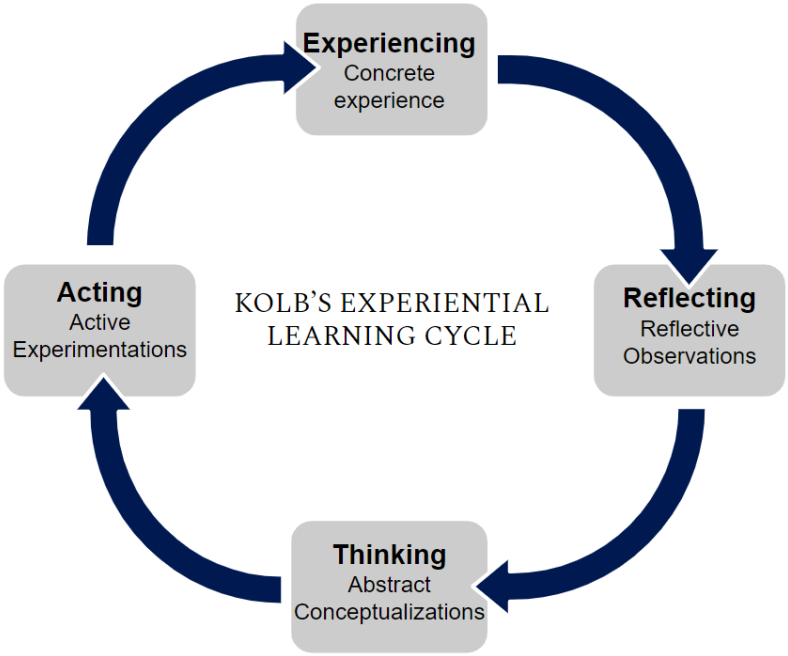

Figure 2.2: Kolb's Experiential Learning cycle.

The learning cycle emphasizes that learning is a continuous process that isn't linear (A. Kolb & Kolb, 2018). To emphasize how each iteration of learning is supposed to build upon previous iterations' learning, the iterative cycles can be viewed as a learning spiral; see Figure 2.3.

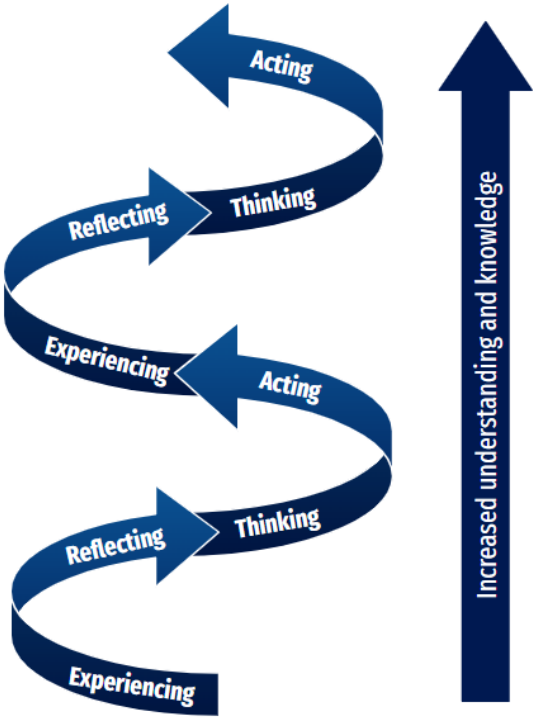

Figure 2.3: Kolb's Experiential learning spiral.

Experiencing concrete experiences and hands-on activities is the recommended start of the experiential cycle, as it is a natural basis for observations and reflections (A. Kolb & Kolb, 2011). Individual and collective reflections facilitate abstract conceptualizations and an increased understanding of complex concepts (A. Kolb & Kolb, 2011). By completing these steps, concepts can be actively tested, creating experiences that start a new learning cycle. A. Kolb and Kolb (2011) further emphasizes that learning is individual, creating the need to adapt the learning cycle based on learners' needs and preferences.

3
Research Methodology

This chapter covers the research methodology utilized during the thesis. Firstly, a motivation behind why a qualitative research strategy was chosen for the study. Secondly, the Case Company will be presented regarding the historical background, operational context, offerings, organizational structure, and current challenges. After that, a detailed plan of how the empirical data was gathered, sampled, and analyzed will be presented. Lastly, research quality is presented in terms of trustworthiness and its four sub-categories: credibility, transferability, dependability, and confirmability.

3.1 Research Strategy

This thesis has been conducted in a business research context where the research questions studied a topic relevant to a specific business situation. In this thesis, one business case has been studied, and a case study design has been utilized. A case study is significant in terms of focusing on a bounded situation or system (Bell et al., 2022). Both qualitative and quantitative methods are suitable for case studies; however, the purpose of this study has been to get an in-depth understanding of the case company and evaluate its processes thoroughly, and therefore Bell et al. (2022) argue that applying a qualitative approach is more suitable for studies of this character. Furthermore, conducting qualitative research with an inductive approach is suitable for business research. Moreover, this approach emphasizes drawing conclusions and generalizations based on observations and gathered data from the empirical phase of the study, further evaluating the relationships between theory and research.

A triangulated method has been used in data collection, meaning multiple data-gathering methods have been utilized to understand the topic at hand and strengthen credibility (Yin, 2015). The following methods have been included: interviews, surveys, observation, and review of internal documents and literature. Patel et al. (2019) argues that qualitative studies aim to get a more in-depth understanding of the studied topic. Therefore, a semi-structured interview approach was utilized.

3.2 Case Study at Boeing Flight Operations

Carmen Systems was founded in 1994 in Gothenburg as a branching-off from *Volvo Data*. The company specializes in complex scheduling optimization in the trans-

port industry. Since *Boeing* acquired *Carmen Systems* in 2006, they have been increasingly focused on scheduling airline operations. What previously was *Carmen Systems* is now part of *Boeing Flight Operations*, which falls under the branches *Boeing Global Services* and *Boeing Professional Services*; see Figure 3.1.

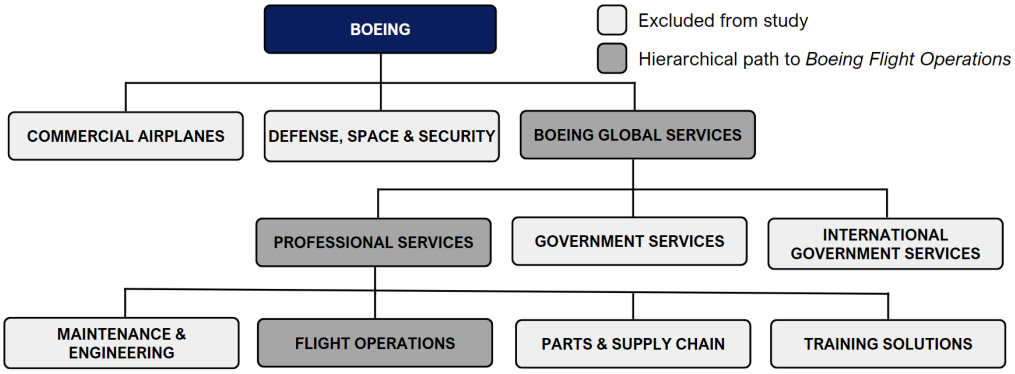

Figure 3.1: Simplified organizational tree, focused on Boeing Flight Operations.

Boeing Flight Operations has approximately 400 employees distributed over five sites worldwide; see Figure 3.2. Their operations are segmented into Americas, EMEA (Europe, Middle East, & Africa), and APAC (Asia & Pacific), with Montreal being responsible for Americas, Gothenburg for EMEA, and Singapore for the APAC region.

Figure 3.2: Visualization of the geographical distribution of *Boeing Flight Operations*.

The operations are further divided into five main business areas supported by support functions to enable a holistic offering, covering advisory & sales, in-house software development, product implementation, and client retention & support; see Figure 3.3. These business areas are Solution Consulting, SE & AT (Software Engineering & Advanced Technology), Implementation, Client Services, and Portfolio Management.

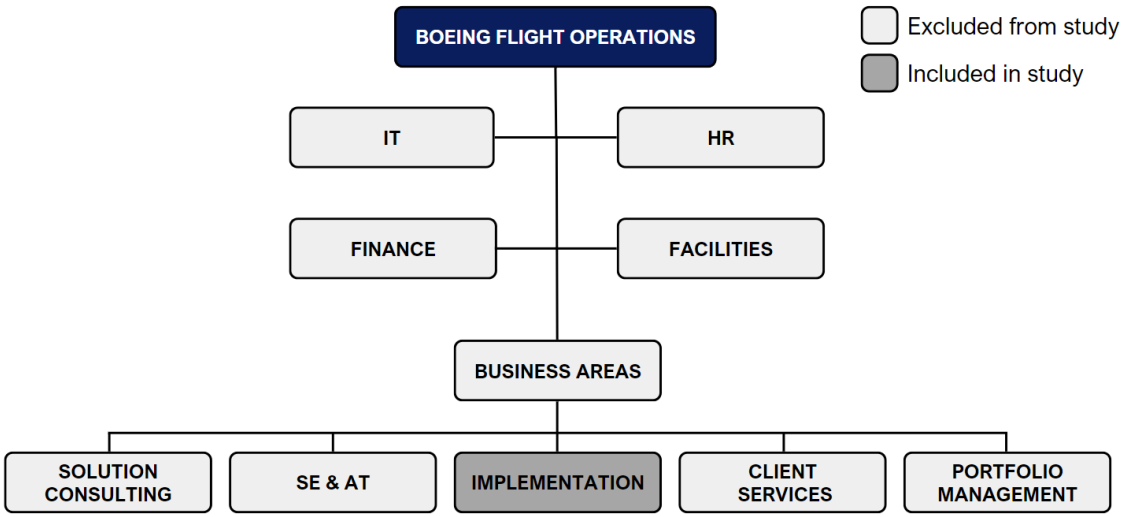

Figure 3.3: Organizational structure within *Boeing Flight Operations*.

SE & AT develops the core of *Boeing Flight Operations* products in-house before the implementation department tailors the product to match each customer's specific needs and implements the product. After successful implementation, the customer is transferred to Client Services for continuous maintenance and customer retention work. The Portfolio Management department manages the product offering to ensure that the offering matches the market demand.

The Solution Consulting department mainly works with pre-sales activities and airline solution consultancy. The pre-sales activities include benchmark studies, product demos, and scoping studies for implementation projects.

3.2.1 Boeing Flight Operations Product Portfolio

Boeing Flight Operations' core focus is to optimize aircraft and airline personnel scheduling to increase airline efficiency. Efficient scheduling for airlines can increase airplane airtime, decrease personnel layovers, and reduce fatigue among personnel. To achieve this *Boeing Flight Operations* has a broad product portfolio for schedule optimization spanning from long-time horizons to operative changes and follow-ups; see Figure 3.4.

Within crew planning *Boeing flight Operations* offer the following products: Manpower Planning, Crew Pairing, Crew Rostering, Crew Tracking, and Crew Bid. Manpower Planning enables airlines to strategically plan for the long term, optimizing headcount, qualifications, and price. The goal is to efficiently manage the long-term needs of staffing the airline.

Crew Pairing aims to optimize crew efficiency by developing efficient scheduling plans. By optimizing crew pairing, costs, planning time, and crew fatigue can be reduced while increasing operational robustness for the schedules. The created pairings are later staffed through the Crew Rostering product. The Crew Rostering

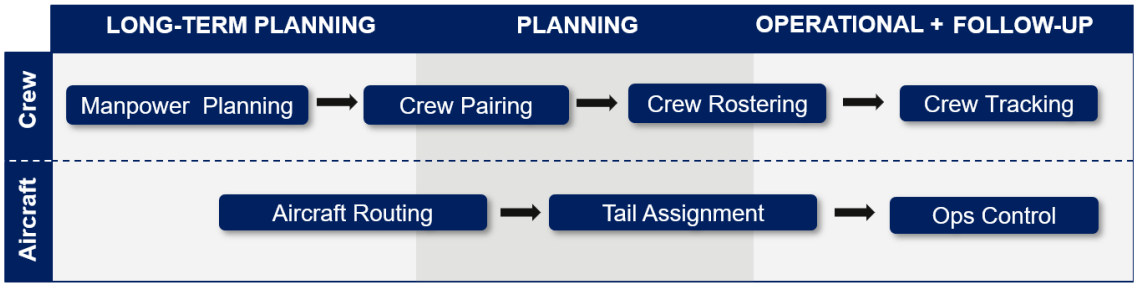

Figure 3.4: *Boeing Flight Operations* main product portfolio divided between crew- and aircraft-oriented products with different planning horizons.

product optimizes rostering based on pre-stated rules for each airline, country, and role. For example, it considers availability, legality, competencies, crew preferences, and the unions. The Crew bid product can further complement it, enabling the crew to bid on schedule preferences. In the operational stage, Crew Tracking handles disrupted airline crew schedules. This includes all operational changes to rosters and is crucial for airlines' daily operations.

Boeing Flight Operations product offering toward aircraft planning comprises Aircraft routing, Tail Assignment, and Ops Control. Aircraft Routing is used for long-term planning and optimizing the routes the airline should fly daily. Tail Assignment is then used to assign specific aircraft to each created route. Ops Control handles all operational changes on the day of operations, ensuring aircraft availability. The complexity of aircraft products is generally lower as they don't include humans. However, optimizing aircraft usage is still crucial as each aircraft is a big investment that needs optimized airtime to maximize profitability.

Furthermore, *Boeing flight Operations* offers services and products within, for example, Calibration and Fatigue Risk Management. They are also currently developing SaaS solutions to enhance their product and service offerings further. The current product portfolio is sold as products, with additional implementation projects and the possibility for long-term support solutions.

3.2.2 Boeing Flight Operations Implementation Department

Boeing Flight Operations Implementation runs the implementation projects for all products being implemented. The implementation is mainly composed of configuring the core product, delivered by SE & AT, to the specific needs of each airline. The configuration includes adapting rules, interfaces, and KPIs (Key Performance Indicators) and integrating the product into the client's current processes and operations. This is primarily done with a combination of Python and their in-house programming language, Rave. The role of the implementation department is internally at *Boeing Flight Operations* visualized through their "Avocado-model"; see Figure 3.5. Emphasizing that changes in the core product can be updated to all clients simultaneously while implementation configures the softer outer layer of the product.

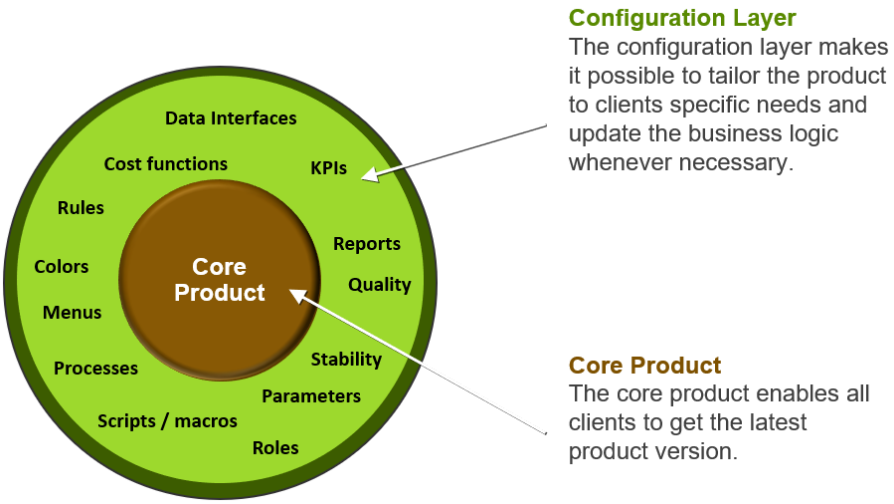

Figure 3.5: The Avocado-Model, dividing the responsibilities of implementation projects between SE & AT and the Implementation department.

The implementation department comprises nine agile project teams specialized in different areas of *Boeing Flight Operations* product portfolio. The team size depends on project and product complexity but generally spans 5-15 people. The projects are run by a PM (Project Manager) and CSO (Client Solution Owner), where the PM is responsible for the overall project delivery and the CSO for the technical solution.

3.2.3 Case Description

Boeing Flight Operations Implementation in Gothenburg has identified the current onboarding time as an area with possibilities for improvements. The process is experienced to be longer than necessary due to the need to combine business understanding with high technical expertise. This, combined with varying previous experiences and different conditions for learning depending on product, project, team, and more potential factors, makes it more difficult to standardize their onboarding process compared to other internal departments.

Due to the differences in operations and variation between internal departments, only the implementation department will be included in the scope. By targeting the most complex onboarding environment *Boeing Flight Operations* aims at being able to conclude learnings applicable to less complex onboardings as well.

A Benchmark study at *Boeing Flight Operations* offices in Montreal and Singapore was conducted to draw learnings from similar processes in similar environments. The Benchmark study facilitated initiatives applicable at a global scale and aligned ways of working within *Boeing Flight Operations Implementation*.

Due to the need to develop both high technical skills and a deep business and customer understanding during the onboarding, *Boeing Flight Operations Implementation* has been deemed a suitable case for understanding the challenges of developing multidisciplinary skills during onboarding. These challenges are inevitable for *Boeing Flight Operations Implementation* due to their products being developed in-house with an internal programming language, making recruiting the exact competencies difficult. They are further operating in a niche market, making the industry expertise hard to recruit. As the biggest office within *Boeing Flight Operations Implementation*, Gothenburg gives a global perspective to challenges when supported by benchmarking from other international regions. *Boeing Flight Operations Implementation* are hereby referred to as the Case Company.

3.3 Literature Study

The primary strategy for gathering insights from prior research was through a narrative literature review. According to Bell et al. (2022), a narrative literature review approach is deemed suitable for qualitative studies and is characterized by its less focused yet comprehensive nature, wide-ranging scope, and capacity to facilitate a more nuanced synthesis of complex research findings. Therefore, using the narrative approach iteratively gave the researchers the advantage of better identifying knowledge gaps that could be investigated and researched further. These identified gaps and emergent new directions enriched the study and contributed additional insights (Bell et al., 2022). The literature review played a crucial role in developing a theoretical framework upon which the subsequent stages of the thesis were established, particularly in shaping the focus areas for the interviews and providing support during the data analysis.

Databases distributed by Chalmers Library, Gothenburg University Library, and Google Scholar were the primary sources for acquiring literature. Since the thesis investigated the onboarding process for an IT company, the main keywords utilized included: *Onboarding Quality, Onboarding Efficiency, Onboarding Process, Onboarding Barriers, Mentorship, Software Development, Learning and IT-Company.* It is important to note that these keywords initiated the literature data collection process. Subsequently, if new and relevant keywords emerged, these were investigated to determine their potential contributions to addressing the research questions under investigation.

3.4 Data Collection

Data collection is an essential part of business research and serves as the main base for the study. This chapter describes the different phases of the empirical process, such as interviews, the survey study, sampling strategies, and corporate documents. Lastly, it presents how the gathered data was structured and analyzed.

3.4.1 Interviews

A qualitative semi-structured empirical study was carried out to understand the current situation at the Case Company. As noted by Bell et al. (2022), semi-structured interviews offer a degree of flexibility, enabling tailored interviews based on the participants' answers. This flexibility facilitated the exploration of spontaneous topics and in-depth discussions and allowed participants to narrate their experiences in their own words. Moreover, it allowed the interviewer to acquire a more personal perspective from the participants regarding the topic under investigation, which Bridges et al. (2008) and Patel et al. (2019) highlight as an upside of conducting semi-structured interviews.

Regarding the selection of participants for the case study, purposive sampling was applied to narrow down the participants to individuals directly related to the research questions. Both criterion-based sampling and a snowball approach were adopted, enabling respondents to recommend other relevant participants within the company to participate in the study. Purposive sampling, criterion-based sampling, and snowball sampling are all highlighted sampling strategies by Bell et al. (2022) for qualitative research. The criterion strategy proved advantageous in identifying areas of expertise relevant to the study. Examples of criteria included individuals who had recently undergone an onboarding process within the implementation division and recent mentors.

The interview process began with three unstructured interviews, with respondents recommended by our steering committee at the Case Company. The interviews consisted of two mentors and one mentee. This initial step facilitated a mutual understanding of their potential challenges and needs. The unstructured interviews laid the foundation for subsequent interviews and helped identify valuable research areas. Following this, a research guide was constructed, primarily comprising open-ended questions for free discussion with the respondents. One guide was made for the mentees, and one was made for the mentors to see the process from two perspectives, see Appendix A. The interview process was ended by conducting five benchmarking interviews with respondents from Montreal and Singapore. The purpose was to get insights into onboarding processes in a similar environment and potential differences between their processes globally. In total, 24 interviews were conducted, divided over three sites, and with varying experience; see Table 3.1.

Table 3.1: An overview of interviews divided into the study's main phases. "NA" is used for respondents not actively working with a specific product.

Phase & ID	Role	Product	Experience	Location
Pre-study				
1	Mentee	Rostering	6 months	Gothenburg
2	Mentor	Tracking	5 Years	Gothenburg
3	Mentor	Rostering	2 years	Gothenburg
Main round				
4	Mentee	Rostering	18 months	Gothenburg
5	Mentor	Ops-control	18 months	Gothenburg
6	Mentee	Ops-control	6 months	Gothenburg
7	Mentee	Manpower	18 months	Gothenburg
8	Mentor	Tracking	2 years	Gothenburg
9	Mentee	Tracking	6 months	Gothenburg
10	Mentee	Rostering	18 months	Gothenburg
11	Mentee	Pairing	6 months	Gothenburg
12	Mentee	Rostering	18 months	Gothenburg
13	Mentee	Manpower	6 months	Gothenburg
14	Manager	NA	5+ years	Gothenburg
15	Manager	NA	5+ years	Gothenburg
16	Manager	NA	5+ years	Gothenburg
17	Mentee	Tracking	6 months	Gothenburg
18	Mentee	Tracking	6 months	Gothenburg
19	Mentor	Ops-control	5+ years	Gothenburg
Benchmarking				
20	Mentee	Manpower	12 months	Montreal
21	Mentee	Rostering	6 months	Montreal
22	Mentee	Tracking	6 months	Montreal
23	Mentor	Manpower	5 years	Montreal
24	Mentee	Tracking	6 months	Singapore

According to Jacobsen et al. (2021), face-to-face interviews are recommended to achieve a rich exchange of information, as this approach enhances the possibility of observing and reacting to body language and facial expressions. Therefore, to the greatest extent possible, all interviews were held at the Gothenburg office, although unforeseen circumstances sometimes necessitated remote interviews via WebEx. Each interview was structured with one main interviewer and a secretary who could participate with follow-up questions if necessary. A setup of this kind allowed the note-taking author to have a more observant role and intervene if the interview was leading in the wrong direction. All interviews were recorded and documented, ensuring accurate prerequisites during the coding process and data visualization, which (Miles et al., 2020; Patel et al., 2019) highlight as crucial to achieving high research quality.

Bell et al. (2022) emphasized the necessity of ensuring comfort for respondents during interviews to secure honest perspectives on potentially delicate topics. Several measures were implemented to uphold the study's integrity and mitigate ethical concerns. Firstly, to reduce the risk of deception, practitioners were thoroughly briefed on the aim of their participation before giving their consent. Furthermore, participants were given the option to decline participation, along with assurances of anonymity to protect their privacy. Moreover, a time limit was communicated to avoid creating a rushed situation. These actions aimed to create a comforting environment, enabling respondents to feel safe to delve deeply into the topic at hand and minimize the risk of harm and invasion of personal privacy.

3.4.2 Survey Study

A structured survey study complemented the semi-structured interviews to evaluate the usage of onboarding methods and tools in the different phases of the onboarding process. The goal was to identify variations between different phases and get elaborations motivating the usage of the tools for each phase. To identify the most prominent methods and tools, respondents were limited to highlighting the five most influential methods and tools per phase for their onboarding experience, divided based on impact on productivity and socialization, see Appendix B. The methods and tools given as alternatives were identified through the pre-study interviews and the identification of influential onboarding methods and tools by Buchan et al. (2019).

The Survey was conducted in the form of structured interviews at the end of the semi-structured interviews to mitigate the downsides of self-completion surveys. According to Bell et al. (2022), self-completion surveys have a greater risk of missing data and a lack of possibility to support respondents and probe for elaborations. Bell et al. (2022) further emphasizes that interviewer variability and respondents' convenience are upsides of self-completion surveys compared to structured interviews. Therefore, the role of the interviewers was the same for each structured interview, and it was conducted right after the semi-structured interviews to limit the inconvenience for respondents.

3.4.3 Corporate Documents

Internal and external corporate documents in Confluence (Web-based corporate wiki) were analyzed to better understand the Case Company and its operations. There is according to Bell et al. (2022) a risk of corporate-produced documentation including biases for specific departments, processes, or overall operations. Cross-referencing between corporate documents, interviews, and observations was employed to mitigate the risk of incorporating biased information into the study. The analysis of corporate documents was further prioritized in the early stages of data gathering to facilitate more critical cross-referencing of information during the interviews. The main documents analyzed consisted of descriptions of the case com-

pany's operation, organizational structure, and onboarding-related documentation. The onboarding-related documentation included company introductions, onboarding checklists, and role descriptions used when onboarding new employees.

3.5 Data Analysis

Qualitative research entails a rich amount of data to analyze, and compromising and identifying patterns in large amounts of unstructured data is difficult without a strategic and systematic approach (Bell et al., 2022). The authors further present grounded theory and thematic analysis, which are the data analysis approaches most utilized in qualitative studies. Grounded theory has been criticized for being too narrow. However, the advantage of this thorough process is that it focuses on iterations of analyzing the data simultaneously as it is being gathered. Thematic analysis, on the other hand, is more flexible, although the primary focus of this strategy is to identify patterns and common themes in the data (Bell et al., 2022). A new method that utilizes these two strategies' advantages is Miles et al. (2020) qualitative data analysis. This analysis consists of three primary stages: Data Condensation, Data Display, and Drawing and Verifying Conditions. These three stages are performed iteratively and cyclically throughout the study; see Figure 3.6.

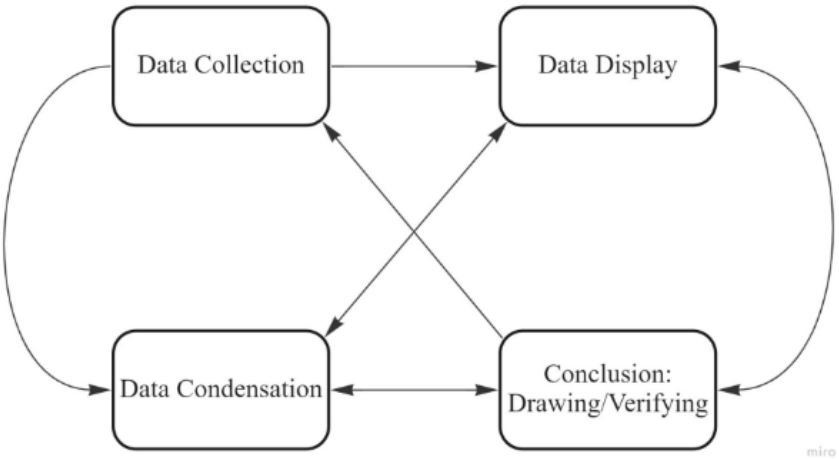

Figure 3.6: Interactive model data analysis components (Miles & Huberman, 2020).

Data Condensation represents the initial phase, where raw data from interview transcripts, notes, and documents are streamlined to facilitate easier selection and abstraction (Miles et al., 2020). Data collection and condensation occurred continuously throughout the study, from the start of conceptualizing the aim of the research until the final report was completed. Miles et al. (2020) argue that the help of data condensation not only structures the data and identifies focal areas in the beginning but is also a continuous iterative approach until the conclusion can be drawn and verified.

Data Display is the second part of the process, focusing on displaying all gathered information. Data was displayed in FigJam (Collaborative web application for visualized brainstorming) by gathering important insights from previously transcribed interviews. The display of data is visualized in Figure 3.7.

Figure 3.7: Display of 286 insights from interviews visualized in FigJam.

Applying a thematic analysis to the presented data in Figure 3.7 was useful for coding and identifying common themes in the gathered data. Thematic analysis was done by searching for, e.g., repetitions, mesopores and analogies, similarities and differences, linguistic connectors, indigenous typologies, and lastly comparing with common themes in related literature, which is the steps recommended by Bell et al. (2022). Seven common themes were identified in the gathered data: mentorship, methods and tools, courses, onboarding processes, project stage, socialization, and learning possibilities. All these were then coded more in terms of positive, negative, improvements, and general aspects related to the theme; see Figure 3.8.

Figure 3.8: Display of themes identified through thematic analysis in FigJam.

Drawing and Verifying Conditions is the third phase of the analysis (Miles et al., 2020). Conclusions in the form of patterns, assertions, explanations, and casual flows were drawn simultaneously during the data collection and data analysis process. Miles et al. (2020) means that the researchers usually hold these contents lightly, although they are later revisited to build upon and verify if they are of essence for the study.

Lastly, Miles et al. (2020) emphasizes the need to verify the conclusion and the patterns identified throughout the process. Therefore, the conclusion was not drawn until data collection was finished and triangulation was possible to verify the findings.

3.6 Research Quality

This section aims to describe the strategy implemented to safeguard the quality of this report. Bell et al. (2022) propose that trustworthiness and authenticity are suitable quality criteria for qualitative studies. Trustworthiness consists of four foundational pillars: credibility, transferability, dependability, and confirmability. These sub-criteria are described below.

3.6.1 Credibility

The first criterion presented by Bell et al. (2022) is credibility. Research credibility contains aspects to ensure that the execution of the research is in compliance with good practice and depicts the social setting correctly (Bell et al., 2022). The authors further describe how the degree of credibility affects the research's acceptability among its recipients, as high credibility ensures a correct interpretation of the social setting of the study. One method recommended by Bell et al. (2022) for achieving increased credibility is triangulation, meaning that multiple methods and sources are combined and cross-referenced to increase the study's credibility.

This study's credibility has been ensured by continuously retaining close connections and communicating with the Case Company's representatives to understand the organizational setting better and provide a correct depiction of it. Triangulation was used to further increase the study's credibility by gathering data through observations, interviews, surveys, and internal documentation, which were cross-referenced during the data analysis.

3.6.2 Transferability

A study's transferability refers to its degree of generalizability (Bell et al., 2022). The authors emphasize the difficulty of achieving high generalizability within qualitative research as the results tend to be based on specific cases and their current situations. Therefore, it can be challenging to generalize to other organizations or even the same organization at different points in time (Bell et al., 2022). One strategy of mitigation is to create a "thick description", which is information to create a

rigid understanding of the Case Company to facilitate the readers to analyze which aspects that could be transferable to their context based on similarities and differences with the Case Company (Bell et al., 2022).

"Thick description" was the main strategy used to increase the study's transferability. This has been deemed additionally important as the operations and organizational structures of the case organizations aren't well documented in other literature.

3.6.3 Dependability

The third criterion within trustworthiness is dependability which regards the stability of the data over time and during constant conditions (Bell et al., 2022). In other words, dependability's main quality focus is to ensure consistency and that the study could be repeated with the same participants in a similar context. To achieve dependability Bell et al. (2022) suggest utilizing an auditing approach; this method builds upon gathering comprehensive records of all phases and processes throughout the study.

All data gathered during the thesis has been stored in a structured and systematic folder system, making it easy to navigate and return to old documents and findings.

3.6.4 Confirmability

Lastly, confirmability is the fourth criterion for building research trustworthiness. Confirmability refers to the objectivity of the research findings. Likewise, this criterion builds upon ensuring that neither the process nor the findings are influenced by research biases (Bell et al., 2022). Objectivity throughout the study is crucial to ensure transparency and authenticity of the findings from the research.

To mitigate biases and establish objectivity, personal values nor theoretical inclinations shall sway the research or findings in a specific manner (Bell et al., 2022). Triangulation has been used to increase confirmability in the thesis by utilizing multiple methods, theories, and sources in addition to cross-checking data. Triangulation has further helped confirm that independent methods or sources lead to similar findings. Secondly, reflexivity is another approach used, in which the researchers document their conclusions and insights to differentiate what is one's perception of the data and what is an objective finding (Bell et al., 2022). Lastly, participants in the interview study were contacted if questions arose during transcription to ensure that the data was correctly interpreted.

4

Results

The following chapter presents the results obtained through the case study. The data collection was comprised of 24 interviews, a survey study, an analysis of internal documentation, and a benchmark study of the Montreal and Singapore offices. The findings are organized into four sections. Firstly, a short description and overview of the onboarding process is presented. After that, the Case Company's onboarding processes are presented in depth and visualized. After that, onboarding barriers and their experienced impact are presented. Lastly, improvement initiatives to mitigate the impact of identified onboarding barriers will be presented.

At the Case Company, the onboarding process aims to integrate new employees into the organizational culture and ensure they efficiently obtain the skills necessary for the new role. Interviews have shown that the time needed to integrate socially and become an efficient team member can vary between 3 and 12 months. The variation depends on multiple factors, including personal-, organizational-, and process-related aspects, either facilitating learning or creating potential barriers to effective learning.

The main personal aspect affecting time to productivity and respondents' experience of the onboarding process has been their previous experience, especially from the aviation industry. Previous experience in the aviation industry has been the greatest indicator of time to productivity, and most respondents have identified business understanding of the aviation industry as one of the most challenging parts of onboarding.

"Learning the business logic was the most challenging for me"
- Mentee

"I find that the business logic is the part that takes the longest time to learn"
- Mentor

"Previous experience from the aviation industry impacts the onboarding time heavily"
- Mentor

Other significant personal aspects impacting the onboarding process have been the personality and interest of the mentee, as well as cultural differences. The diversity of new employees implies that different challenges will be faced during the onboard-

ing. Highlighting why onboarding processes must be adaptable and flexible to both individual needs and organizational requirements.

The onboarding process uses a 12-month mentorship program to help mentees integrate socially and create structured learning. The learning is mainly facilitated by a combination of courses and role-specific tasks within the team. This setup creates freedom and adaptability for each mentee to create a personalized onboarding process. This adaptability has created divided opinions among respondents, where some prefer autonomy and freedom while some highlight the lack of standardization as challenging.

4.1 Onboarding Process

RQ1: What processes are in place for onboarding new employees?

The Case Company currently has two different onboarding processes, one for their talent program *Earn Your Wings* (EYW) together with Nexer and one process for regular onboarding; see Figure 4.1. The processes have similar structure and content, with some additional activities for EYW. The main differences between the processes are presented in section 4.1.1. All onboardings start with orientation activities, aiming to welcome the new employees to the company and their project team. Furthermore, the onboarding activities, primarily composed of mentorship and courses, are presented to give an understanding of the onboarding process. Respondents have experienced a lack of clear goals during their onboarding, making it challenging to manage their own development. Other respondents have highlighted this as a positive aspect as it reduced stress and allowed them to focus solely on their individual development rather than achieving specific goals during their onboarding.

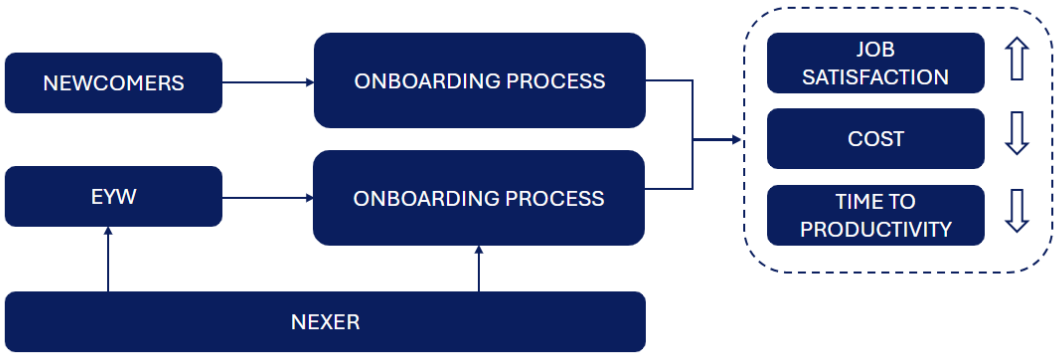

Figure 4.1: Onboarding processes at the Case Company.

The onboarding process at the Case Company in Gothenburg is mainly built upon a mentorship program, where all new employees are assigned a personal mentor. From the first day, the new employee's mentor is the primary person responsible for guiding and helping the mentee carry out their daily work. This includes planning

a structured mentorship, where the new employee can learn their role, work tasks, and business culture.

Mentoring starts when managers assign team members a mentee based on who is willing and deemed suitable for becoming a mentor. Employees can also emphasize a desire to become a mentor for upcoming onboardings. Some mentors have experienced the process of getting a mentee as unstructured as they have been informed of their new role with short notice. This has affected their possibilities to prepare material for the mentee's onboarding. The mentor and mentee are usually part of the same project team, as that has been experienced as the most efficient way of getting time together. There are currently no formal prerequisites to become a mentor regarding neither previous experience nor an employment role. The mentorship generally extends up to 12 months unless otherwise has been stated. Previous mentors have described the mentorship role with the two following statements:

"Mentor is helping with technical things, answering questions, and giving directions to whom to ask questions. A broad responsibility towards helping"
- Mentor

"The goal is always to make the new person as comfortable in the team as possible"
- Mentor

As stated above, the mentor's role is quite broad in integrating the new employee into the team and organization while helping to ensure that the new employee reaches the desired productivity within a specific time frame. Since anyone within a team can become a mentor without prior prerequisites, some uncertainty has been expressed by more junior employees about taking on mentoring roles regarding how to be a good teacher, how to give feedback, and how to navigate hard questions. Furthermore, some mentors have expressed uncertainty regarding what is expected of them and how to navigate the role of a mentor regarding time management and guidance. Nevertheless, all mentors are thrilled to give back to the new employees, independently of their personal onboarding experiences. They aim to provide new employees with a positive experience and enhance the mentorship program for incoming employees. Mentees with a more junior mentor felt more natural connections and relationships with their mentors since they had recently undergone an onboarding. Although more junior mentors might not have answers to all questions, they can easily relate to their own onboarding experiences, which multiple mentees have positively noted.

"In terms of social aspects, I think it was nice that my mentor was relatively new; we worked well together, and it lowered the social bar, so you could take it easy."
- Mentee

"I can ask my mentor who was in my position last year, and who can give me clear and simple answers, as opposed to asking a more senior person who speaks and explains in a way that is harder to understand"
- Mentee

4.1.1 Earn Your Wings

The Case Company and *Nexer Group* hold a Talent Program to recruit new talents to the organization. This year-long program successfully hires around 20 new talents annually. The program starts in August and has a structured schedule with courses and activities planned throughout the onboarding process.

The onboarding process is quite similar to the ordinary onboarding process; however, they differ slightly in course load, networking possibilities, and mentor support. The talent program is initially course-intense, combining the ordinary *Crew Acadamy* courses with ten courses hosted by *Nexer*. The combination of all courses has been stated as overwhelming by some of the new employees in the program. Secondly, the new talents go through the whole program together and get a natural social context and network. Going through the onboarding with fellow new employees has been expressed as very positive, giving all new employees in the program a social network outside their team. Furthermore, it enables a cross-functional network within the organization since the program recruits new talents for the whole organization. Lastly, mentors and mentees have positively emphasized that they get support in the mentorship program. At the beginning of the onboarding, the mentors and mentees are introduced to the basic concepts of mentorship in a workshop, where they can discuss expectations and goals. Therefore, it is easier for both parties to gain as much as possible from the mentorship. Employees who have mentored an EYW mentee have expressed that they appreciated the support and introduction lecture on mentorship provided by *Nexer*, as it helped them understand the expectations and responsibilities of their mentoring role.

4.1.2 Course Structure

Another significant aspect of the onboarding process is the attendance of courses. Most courses are 1-3 days long in-house classroom-based training through *Crew Academy*. The *Crew Academy* courses are developed and conducted by senior employees at the Case Company, taking on headteacher and instructor roles part-time for courses related to their operational roles. This ensures alignment between product and course offerings towards the Case Company's clients. The courses are, therefore, adapted to clients' needs and prerequisites rather than new employees going through the onboarding process. The closest manager is responsible for enrolling new employees in relevant courses and identifying a learning path. This has been experienced as challenging, as the courses are pre-scheduled and need sufficient participants. Most of the courses are available 1-2 times per year. Which has resulted in unsatisfactory alignment between course timing and mentee development. This has been highlighted by multiple respondents, as shown below:

"The Academy courses aren't flexible regarding scheduling"
- Mentee

"It has been a problem for me with delayed courses due to few participants"
- Mentee

"The courses have been poorly scheduled for me as I have completed courses that I feel won't be relevant for me for another six months"
- Mentee

The onboarding process is generally course-intense in the first months to ensure that mentees are introduced to both the technical skills and business understanding needed to work within the implementation department. Combined with limited flexibility in course scheduling, this can create a sense of "information overload" for mentees who lack prior experience in the aviation industry.

These previously known challenges have contributed to developing digital resources to enable self-study of *Crew Academy* courses. Three e-courses and material from physical courses are internally available for self-studying at the Case Company. This transition of digitizing the course offering is currently ongoing. During the interviews, digital resources were highlighted as the most positive aspect of the course offering:

"Easier to tailor and plan the courses in regards to your own onboarding"
- Mentor

"Positive that you can manage the courses and your time on your own"
- Mentee

"Having more digital courses would make it easier to tailor the learning to our current needs and conduct certain courses multiple times if needed"
- Mentee

Respondents have seen a more digital course offering as a possibility to increase flexibility and conduct courses relevant to each mentee's development. However, increased digital offerings reduce social interaction in the courses, which has been highlighted as unfavorable from an onboarding socialization perspective. It is mainly experienced mentors who have underscored that physical courses enable more questions and interactions between mentees, teachers, and clients, as well as being a good forum for meeting new people and socializing:

"Physical course is a good opportunity to meet new people and to socialize"
- Mentor

"Positive to have a combination of internal and external people on the courses, as that can lead to a better variation of questions"
- Manager

"I prefer to have courses in person to enable questions"
- Mentor

4.1.3 Onboarding Methods and Tools

Various methods and tools are used throughout onboarding to facilitate learning and social integration. The influence of each method and tool on mentees' development has been shown to change over time as mentees' skills and needs change. Table 4.1 shows respondents' views on the impact of each method and tool during the onboarding process phases. The answers are divided based on the four phases of onboarding highlighted in the internal onboarding checklist: month 1, months 2-3, months 4-6, and months 7-12.

Table 4.1: Number of respondents highlighting different onboarding methods & tools contribution to productivity during the four phases of the onboarding process. Each respondent highlighted up to 5 Methods & Tools per phase.

Methods & Tools	**Phases (months)**			
	1	**2-3**	**4-6**	**7-12**
Mentorship	15	15	3	1
Training Courses	13	7	1	0
Pair programming	12	8	5	4
Team/Peer Support	7	10	10	4
Simple Task	7	6	3	1
Online Communities	4	6	5	3
Code Review	4	15	10	4
Company Introduction	3	0	0	1
Internal Documentation	3	4	3	0
PM-Support	3	1	2	1
Stand-Up	2	3	4	1
Checklist	1	1	1	0
CSO-Support	1	4	7	3
Socialization with Other Teams	1	2	1	1
Team Socializing	1	1	1	1
Customer Contact	0	1	6	5
Team Retrospective	0	0	4	3

During the mentee's first month, it is evident that mentorship is highly appreciated and viewed as a cornerstone for successful onboarding. As described previously, mentorship gives the mentee a safe relationship with an experienced employee whom they can turn to regarding all questions and uncertainties. Furthermore, Training courses and Pair Programming with 13 respective 12 responses were appreciated methods for learning the work tasks and getting to know the organization and the aviation industry. One mentee described the training courses as *"They have overall been very good for learning"*. Pair programming has been conducted with the mentee and mentors collaboratively writing and discussing code in real-time, facilitating open dialogue. Mentees who did not receive pair programming expressed that its absence was missed: *"I missed pair programming in my onboarding."*. Furthermore, team support and simple tasks were highly appreciated in the first phase. Simple tasks are an easy way to allow new employees to test and learn by themselves and to apply

knowledge gathered through courses. Team support early on has been expressed by new employees as important to feel comfortable asking everyone on the team for help, limiting dependency on only the mentor.

In the second phase, months two and three, respondents still expressed the importance of mentorship, although code review is now the second most appreciated method. Respondent has described Code Review with the following quotes:

"Code reviews have been beneficial for receiving feedback on one's work and learning both technically and gaining a better understanding of various customers in the customers business"
- Mentee

"Much of the technical feedback came through code review and merge requests"
- Mentee

"Code reviews is a good way of learning, both by getting feedback and by reviewing more senior employees code"
- Mentor

Team Support's significance also increased since the new employee worked more integrated with the team during months two and three. Pair programming and courses are still relevant; however, it is more focused on continuing with simple tasks and becoming self-sufficient with the help of Code Reviews. Some respondents also highlighted the aspect of help from internal documentation that can be an alternative to asking the team for help. However, the internal documentation has been described as unstructured and hard to navigate. CSO (Client Solution Owner) support has also been beneficial, although more so further on in the onboarding process.

Code review and team support remain crucial for the productivity of new employees after three months. Nevertheless, as they become increasingly integrated into the workplace and company, the value of customer contact has been highly appreciated. Respondents have described the beneficial aspects of customer contact in the following way.

"Customer contact and getting away and feeling important to the team is very constructive"
- Mentee

"If you've been to some customer meetings, you can take pinpoint observations that you can later incorporate when writing your code"
- Mentee

"It always increases interest and even more so the desire for more customer contact. A few weeks ago, having the opportunity to participate gave me a much greater understanding of what one does and much more insight into seeing one's work and how it contributes to the customer"
- Mentee

Moreover, during months four and six, the focus lies more on becoming self-sufficient and contributing to the team. Support from the CSO, in combination with Customer Contact and team retrospectives, has been identified as helpful methods and activities for increased productivity. These methods can be identified as business as usual and help the new employee integrate into the team and their tasks. Team activities such as stand-ups and Retrospectives are standard in the agile ways of working and have been highlighted by the new employees as effective ways to share their thoughts, questions, and ideas with the team. The team retrospectives have further been described with the following quotes:

"We could give and receive a lot of feedback during retrospectives"
- Mentee

"A natural occasion to share how one feels, get to know each other a bit more"
- Mentee

"A good opportunity to create routines for how we want to work, internal development. How we should conduct our stand-ups, etc."
- Mentee

Moving forward to the last part of the onboarding, there is a considerable decrease in techniques highlighted as significant for productivity, partly because multiple respondents have not yet reached that phase of their onboarding. Secondly, the need for many specific methods and tools decreased because most respondents became self-sufficient between months six and twelve. As visualized in Table 4.1, the focus continuous on the same pattern as in the previous phase, where Customer contact, Code review, team support, retrospectives, CSO- support, and online Communities; essentially, daily operations are the central aspects of creating a good environment for learning and increased productivity.

Based on the survey study, it can be seen that different methods and tools vary in effectiveness based on when they are used. By summarizing mentees' and mentors' experience using the discussed methods and tools, approximate scheduling on when to prioritize which methods and tools can be made; see Figure 4.2.

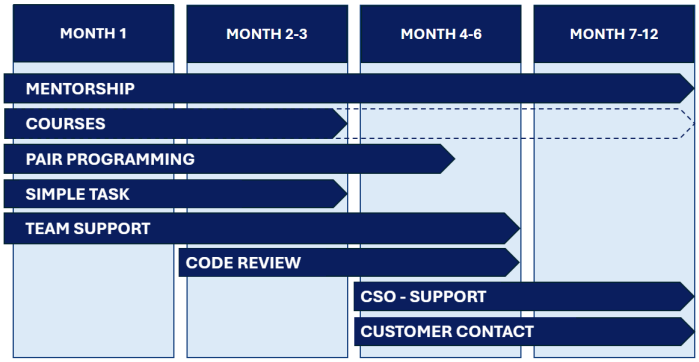

Figure 4.2: Methods & tools integrated into the four phases of the onboarding process.

4.1.4 Benchmark Study

The benchmark study showed considerable similarities between operations in Montreal and Gothenburg. The respondents had experienced similar challenges and valued the social integration. The similarities between Montreal and Gothenburg emphasized that the findings are applicable broader than the specific office of Gothenburg. Some of the main methods highlighted in Montreal are the impact code reviews, pair programming, and simple tasks have on learning during onboarding. The mentor role and roles within projects were further described as similar to those of Gothenburg. The main difference identified was that Montreal has a simulation environment useful for onboarding (training in a box) that ranges over more products than it does in Gothenburg. This could be used globally instead of being developed independently by different sites. Their positive experience of integrating training in a box shows promise in developing it further for Gothenburg as well.

The interview with a mentee in Singapore showed that the differences with Gothenburg are more significant, both regarding processes and culture. In the instance of this respondent, the onboarding process was more individual, with a checklist that gave the mentee a good overview of what to learn during different onboarding stages. Based on analysis of the internal checklist, the Singaporean checklist is experienced as easier for mentees to navigate, potentially making it suitable to draw learnings from when improving checklists in Gothenburg and Montreal.

4.2 Onboarding Barriers

RQ2: What are the barriers to learning associated with an onboarding process?

For the Case Company to achieve its vision of reducing onboarding time for new employees and increasing the process efficiency, various identified barriers must be overcome; see Figure 4.3. The main barriers identified are within the areas of process variation, business complexity, socialization, mentorship, and courses.

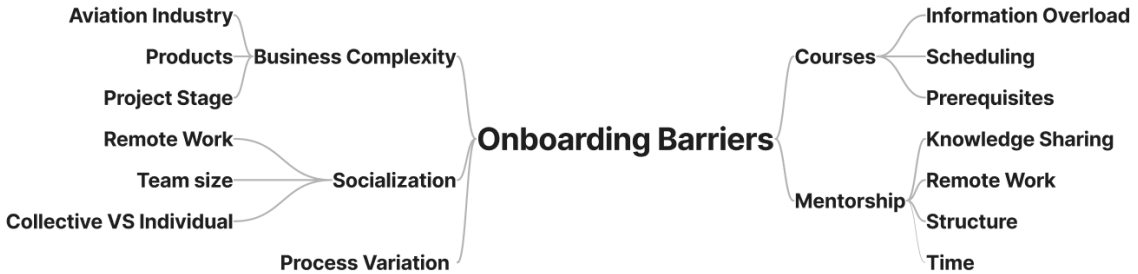

Figure 4.3: Current Onboarding Barriers present at the Case Company.

4.2.1 Process Variation

The natural variation of input to the process, in means of new employees, demands a flexible process that can be hard to standardize. Through interviews, it has been evident that the current process has a high process variation, with most onboardings becoming somewhat unique. This creates a barrier for process improvements and knowledge sharing between onboardings.

4.2.2 Business Complexity

A unique aspect of onboarding within the Case Company is their business complexity. The high complexity expands the curriculum for what is needed to become an effective team member, thereby becoming a potential barrier to efficient onboarding. When joining, the experienced business complexity depends on three main factors: aviation industry knowledge, the product, and the project stage.

The impact of aviation industry knowledge has previously been highlighted as an indicator of time needed to become an effective team member. Showing that a lack of previous experience in the aviation industry can be a barrier to efficient onboarding within the Case Company.

This study has further shown that the stage of a mentee's first implementation project (early-phased, mature projects, close to go-live) impacts the onboarding experience. Respondents overwhelmingly expressed a preference for joining the project in its early phase, rather than a mature phase, as it creates a better learning environment. Some highlighted advantages of joining early-phased projects are that mistakes are less critical, you get to understand customer needs, and you get to follow the whole project process. The negative aspect identified with early-phased projects is that there can be an unclear project structure, which might be stressful for some new mentees.

"I could follow the whole process from the start, and therefore, I feel like I got into everything very quickly"
- Mentee

"As a newcomer, it's good to be involved from the beginning"
- Mentee

"Early in projects, it is still an environment where mistakes are less critical"
- Mentor

The risk of unclear structure at the beginning of projects can be avoided by joining more mature projects. Respondents have also highlighted that getting a holistic overview of the operations through mature projects is easier. However, the increased size of a mature project can make it harder to grasp, creating a barrier to efficient learning.

"The advantage of coming in later was that the team had settled, and they knew what to do"
- Mentee

"Coming in the middle of a module can make it difficult to grasp what one is working on"
- Mentee

Projects are generally intensive closer to go-live, making it harder to set time aside for mentees. Respondents have highlighted that onboarding inexperienced mentees at the end of projects is especially demanding. This is mainly due to the available tasks within the project, its critical stage, and the workload on all team members. However, some respondents have underlined that there is great learning from experiencing a go-live if the project environment and mentee skill set are a good match.

"People have been short on time; initially, people had a bit too much to do"
- Mentee

"Close to the feature release, there are very few sufficiently simple tasks available"
- Mentor

"The team is very busy, and there isn't much time to make mistakes"
- Mentor

The implemented product further impacts the business complexity. Tracking and Manpower have been pointed out as two of the biggest and most complex products to learn. The increased size and complexity raise the bar for what is needed to be deemed self-sufficient. Usually resulting in increased onboarding time.

"Tracking and Manpower are the biggest and most complex products, making it harder to learn everything needed to be self-sufficient"
- Mentor

"Tracking is a big and complex product that takes time to understand from scratch"
- Mentor

4.2.3 Socialization

One of the main strengths of the current onboarding process is the inclusive culture that has enabled smooth socialization and social integration for new employees. The challenging scenarios that have been encountered are related to potential barriers regarding remote work, team size, and collective vs individual onboarding.

Remote work reduces physical interactions between new employees and their colleagues, creating a social integration barrier. Remote work has further made it more challenging to introduce new employees to other teams.

"It has become more challenging to introduce new members to other teams/departments after Covid"
- Mentor

The current social integration focuses on creating a network based on the mentor, project team, and other activities. The team can either facilitate interaction with other teams and departments or limit the new employee to mainly interact with the team. Therefore, dependency on the team can be a potential barrier to social integration. Respondents further highlight that big teams can be harder to make cohesive, further affecting socialization.

Collective or individual onboarding for employees has also been shown to impact socialization. Individual onboarding loses a natural community created during collective onboarding. Potentially creating a barrier to socialization.

The socialization barriers identified are small in the current process, as socialization is a strength in the Case Company. However, the barriers have been present in some instances, especially challenging when multiple socialization barriers are present simultaneously.

4.2.4 Mentorship

The onboarding process at the Case Company is primarily built upon the mentorship program. The barriers to efficient onboarding related to mentorship include remote work, knowledge sharing, structure, and available time. Remote mentorship can complicate learning and socialization, as a close relationship with the mentee is required. Therefore, remote work at the beginning of mentorship is seen as a potential barrier.

"If you're going to be a mentor, I think you should be on-site for at least the first two months"
- Mentee

"As a mentor, it can be harder to be remote since you don't get as close to your mentee"
- Mentor

The current mentorship has a low degree of standardization, making respondents highlight a lack of structure and knowledge sharing as challenging for the mentors. Therefore, the competence of each individual mentor becomes integral. As mentioned before, there are no precise prerequisites for becoming a mentor, creating a wide variety of mentor competencies and backgrounds. These differences are handled by mentors, who get the freedom of adapting the mentorship to match what they can support their mentee with. Low knowledge sharing is, therefore, a barrier to continued improvements of the onboarding process and mentor competence.

"The mentorship was quite unstructured at the beginning"
- Mentee

"Mentorship today looks very different between each team"
- Mentor

"The company could have helped the mentors so they know what to aim for in their way of mentoring"
- Mentee

One of the main barriers to a successful mentorship is the time available for mentoring. Mentors are generally less productive in team deliveries than other team members, as their time is split between multiple responsibilities. Therefore, hectic project stages or part-time work risk limiting the time spent on mentorship.

"The mentor worked part-time, didn't have much time for pair programming"
- Mentee

"I was less productive as a mentor when I had a mentee"
- Mentor

4.2.5 Courses

The broad internal course offering strengthens the onboarding process as the dependency on external courses is eliminated. However, conducting all courses in-house has also shown to come with some challenges during the onboarding, regarding, for example, scheduling, information overload, and prerequisites.

As previously shown, the respondents identified scheduling and timing of the courses as challenging during their onboarding. The constraint of needing at least 4 participants in a course becomes a barrier to efficient course scheduling and learning. However, the constraint is necessary for resource-efficient courses as physical courses aren't feasible without multiple attendees.

"Academy courses can be hard to get the right timing with, therefore good that there are digital resources as well"
- Mentor

"At least four internals are required for a course to proceed"
- Manager

It has further been highlighted that the onboarding is initially course-intense, creating a risk of experiencing an information overload. This could be experienced due to high course volume or lack of prerequisite knowledge. These aspects create barriers to learning as prerequisites aren't clearly stated for onboarding courses, and challenges within scheduling can impact course volume negatively.

"I would have preferred fewer courses in the beginning"
- Mentee

"Can sometimes involve too many courses at the beginning of an onboarding process"
- Mentor

4.3 Improvement Initiatives

RQ3: What initiatives can be undertaken to elevate the quality and efficiency of the onboarding process?

Based on the barriers present in the current onboarding process at the Case Company, improvement initiatives have been developed targeting each barrier to achieve increased quality and efficiency of the onboarding process. The initiatives are visualized in Figure 4.4 and further elaborated below.

Figure 4.4: Improvement initiatives to mitigate and overcome identified onboarding barriers.

4.3.1 Mentorship Initiatives

The mentorship is the focal point of the onboarding process at the Case Company and is unanimously appreciated by the respondents. To improve the mentorship, barriers within knowledge sharing, remote Work, structure, and available time need to be overcome. To mitigate these barriers and improve the current mentorship six initiatives have been identified; see Figure 4.5.

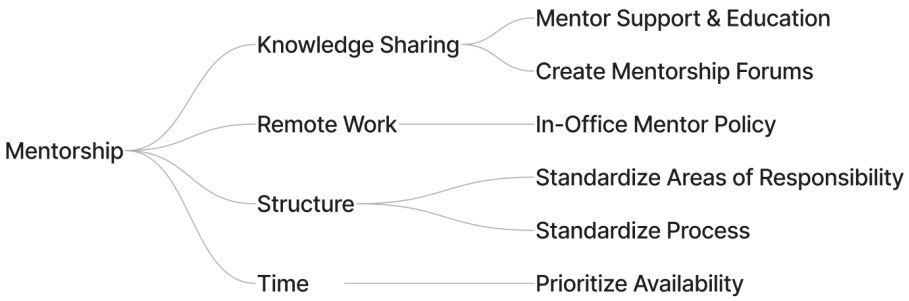

Figure 4.5: Initiatives to mitigate mentorship-related barriers in the onboarding process.

The initiatives aim to give all mentors and mentees the same conditions for success. Therefore, it is necessary to start by identifying which areas should be standardized and which should be adaptable for each unique onboarding. Figure 4.6 visualizes a possible structure with a standardized core and adaptable outer layer with inspiration from the "Avocado model" currently used for implementation projects by the Case Company. The core represents areas that management should be responsible for providing the mentor with, while the mentor and mentee's manager jointly oversees the outer layer.

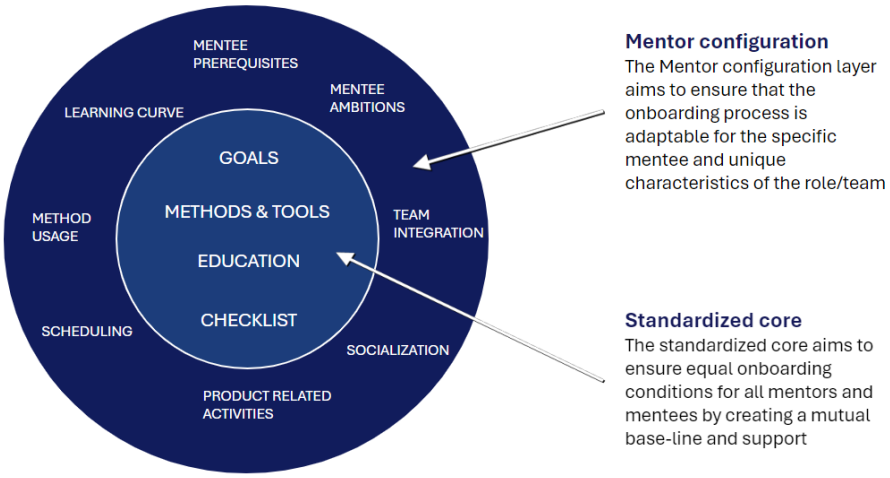

Figure 4.6: Proposed mentorship structure, based on the "Avocado model".

The core focuses on minimizing uncertainty and complexity by providing mentors with checklists, structure, methods and tools, goals, and education, which is essential to enabling a standardized core that gives all mentors and mentees good

conditions to succeed. Mentors have expressed that it is challenging to onboard mentees when it is unclear what is expected from them, emphasizing the need to clearly communicate the expectations for both mentor and mentee. This further entails that the span of responsibility between mentor and manager needs to be clearly stated to increase clarity in the expectations of each role. Formally introducing valuable methods and tools and explaining why they are used during different phases of the onboarding processes is a way of bridging potential gaps in mentorship competence. Clarifying steps and activities for specific phases of the onboarding can be done through onboarding checklists. The current checklist for Gothenburg has faced mixed reactions from respondents. In comparison the checklist in Singapore was highlighted as more easily navigated. Underscoring the possibility of taking some inspiration from the Singapore checklist and focusing on clearly stating who's responsible for each activity in the checklist

To further bridge potential knowledge gaps, it would be recommended that education or workshops be implemented for the mentor and mentee in the initial stages of the mentorship. This is currently done in the EYW onboarding process and has been highly praised by respondents who have undergone their education and workshops regarding mentorship. Nexer currently hosts these activities for EYW, but similar things could be hosted in-house for the other onboarding processes. An additional initiative targeting increased competence among mentors is to create a mentorship forum. This initiative aims to increase knowledge sharing and communication between mentors. This could facilitate a long-term increase in mentor competence through discussing lessons learned and tips & tricks from more senior mentors, continuous knowledge sharing, and contributing to giving all mentorships the same conditions to succeed.

The outer layer of the model focuses on factors that need to be considered when adapting the onboarding to each specific mentee. By providing a workshop for mentors and mentees in mentorships, the mentor and mentee can discuss the expectations and goals of the mentorship. Furthermore, the mentors must adapt the mentorship to the mentee's prerequisites, learning curve, and personality.

Mentors' availability has been identified as a critical factor that can be both a facilitator and a barrier to learning. Therefore, it will be essential that the Case Company values mentor availability highly when selecting a mentor, especially if initiatives to bridge potential knowledge gaps are implemented. Furthermore, mentees highlight that remote work by a mentor becomes a barrier to learning, especially in the early stages of onboarding. To handle this, an in-office policy for mentors for the first months of onboarding would be a potential initiative, at least to match mentees' days in the office. However, one respondent highlighted that the most important thing is that at least one team member is in the office when the mentee is there, highlighting a potential solution where the team can divide the responsibility of matching the mentee's days in the office.

4.3.2 Course Initiatives

As previously highlighted, the academy courses are a significant strength of the onboarding process at the Case Company, but they have some inherent challenges and barriers regarding scheduling, information overload, and prerequisites. To overcome these barriers, initiatives targeting information overload, scheduling, and prerequisites have been identified; see Figure 4.7.

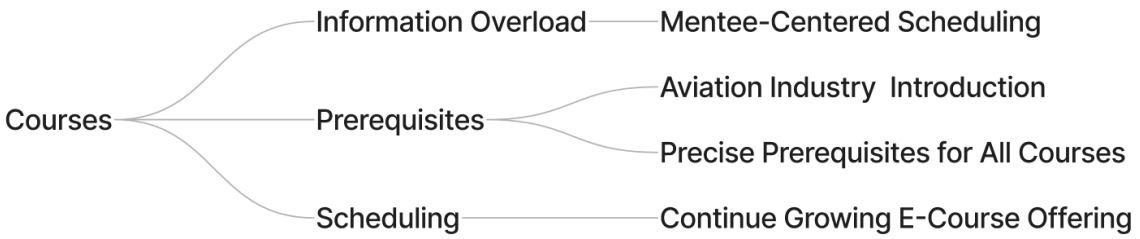

Figure 4.7: Initiatives to mitigate course-related barriers in the onboarding process.

The main downside currently identified by the respondents has been the timing and scheduling of courses. To achieve an efficient onboarding process, a mentee-centered scheduling approach could be adapted for the mentees' courses. This is currently not economically feasible for in-person courses dependent on sufficient enrolled participants. Therefore, the continued digitization of courses could enable mentee-centered scheduling during the onboarding. However, during collective onboarding or when course scheduling aligns, conducting the courses in person can be beneficial to facilitate questions and socialization.

"Having more digital courses would make it easier to tailor the learning to our current needs and conduct certain courses multiple times if needed"
- Mentee

Identifying the optimal timing for specific courses has been challenging due to the variation in previous experience and knowledge among mentees. Therefore, precise prerequisites for each course should be created as part of mentee-centered scheduling. Having precise prerequisites for maximum learning from the courses facilitates more efficient scheduling of each course within the onboarding, ensuring that the course level corresponds to mentees' current knowledge. Furthermore, knowledge within the aviation industry has been seen as a barrier to learning in the courses. By clarifying this as a prerequisite for specific courses, an aviation industry introduction can be developed to ensure that all mentees can meet the requirements and streamline the course learning.

4.3.3 Business Complexity Initiatives

One of the main challenges identified in onboarding new employees to the Case Company is the inherent business complexity. To reduce business complexity-related barriers, initiatives regarding aviation industry introduction, customer contact, and

project stage have been identified; see Figure 4.8.

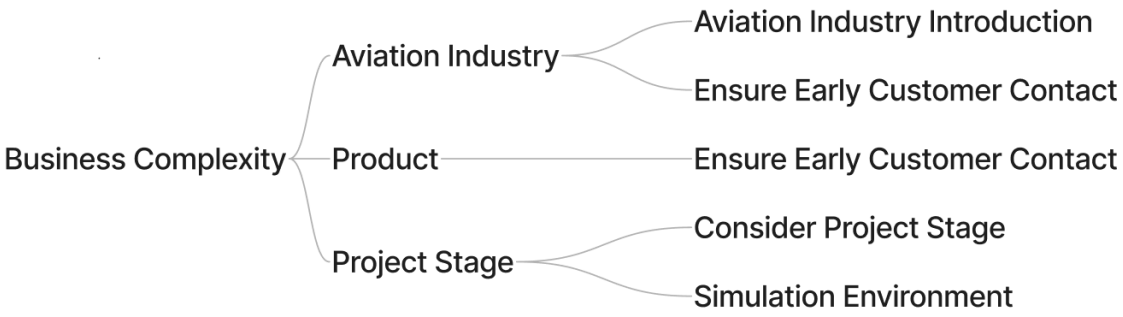

Figure 4.8: Initiatives to mitigate business complexity-related barriers in the onboarding process.

The main business complexity-related barrier relates to a lack of previous aviation industry experience. Aviation industry introductions are currently available for mentees but would benefit from an increased formalization. This formalization can be done through clearly stated prerequisites and goals regarding what aviation industry knowledge is needed to contribute efficiently to projects. This is a central part of the goal-setting initiatives and the onboarding checklist.

Respondents have further highlighted that customer contact has contributed heavily to mentees' learning regarding both aviation industry knowledge and product understanding. Including mentees in customer visits could reduce the business complexity barriers and simultaneously increase interest and motivation. Including customer visits in every onboarding might be challenging depending on project location and stage but would be optimal when applicable.

"I would like for all new employees to have visited a client after one year, but they should have earned it"
- Mentor

"It's important to send new employees on customer visits quickly because it provides a lot of motivation to see the product in a real-life situation"
- Mentor

The final business complexity-related barrier is the impact of the project stage on the onboarding. Therefore, it can be beneficial to consider the project stage to the extent that the team must have time to set aside for onboarding. The challenges for learning in the final stages of an implementation project can be mitigated by having a simulation environment with prepared tasks similar to training in a box or AI-powered learning environments to provide mentees with tasks and solutions. Training in a box is deemed more feasible as it is currently used for most products in Montreal, even though it can be more time-consuming for the team.

4.3.4 Process Variation Initiatives

A high process variation was highlighted as a barrier to learning and knowledge sharing among respondents. It was further emphasized that goal-setting and documentation had high variations between the onboarding processes. There is, therefore, an opportunity for improvement initiatives targeting standardization of documentation and goal-setting; see Figure 4.9.

Figure 4.9: Initiatives to mitigate Process Variation-related barriers in the onboarding process.

As mentorship is a central part of the onboarding process, creating a standardized core within the mentorship aims to reduce process variation. Two specific initiatives to reduce the process variation are standardizing documentation and goal-setting. Goal-setting has been identified as a factor that currently varies between each onboarding, being highly appreciated when working and highlighted as limiting when absent. Mentors have emphasized that clear goals also help them support mentees' learning. Therefore, standardized goals are an initiative that could be undertaken to reduce this variation and ensure that all mentees and mentors know what is expected during the onboarding. Flexibility to adapt goals depending on mentees' previous knowledge is needed to make the goals reasonable for each mentee. Having some standardized goals would further support having prerequisites for specific courses to optimize learning.

Documentation has been highlighted as challenging for mentors and mentees to navigate, sometimes making it overwhelming to get acquainted with all the resources. It would be beneficial to map which resources to focus on to make it easier to navigate, depending on how far the mentee has come in the onboarding process. This would allow mentees to focus on the most relevant resources for the specific onboarding phase.

4.3.5 Socialization Initiatives

Integrating new employees into the organization has generally worked well, with most respondents experiencing the socialization as effortless. The remote work, team size, and collective vs. individual onboarding barriers identified within socialization were seen as minor by most respondents, only creating the need for one improvement initiative within collective onboarding; see Figure 4.10.

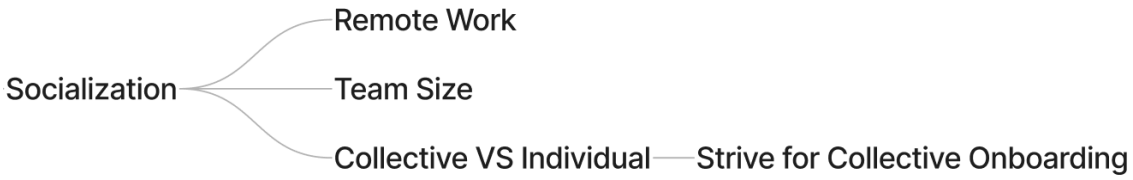

Figure 4.10: Initiatives to mitigate socialization-related barriers in the onboarding process.

Collective onboarding is mainly done through the EYW program. Respondents have highlighted that it provides a natural social context that makes social integration easier. A respondent who wasn't part of EYW but started simultaneously with four other new employees said the same thing, emphasizing that collective onboarding can positively impact socialization even outside EYW. It could be possible to improve the current socialization process further by striving for collective onboarding even outside of EYW. As the goal is to facilitate socialization rather than learning, new employees in different phases of onboarding, different products, or different departments could be grouped to create a sense of togetherness among them.

5
Discussion

The data collection and case study provided insights into the onboarding process from the perspective of mentees, mentors, and managers. In this chapter, the result will be compared to the literature and theory presented in chapter 2. By integrating theory, the result can be further analyzed in terms of generalizability to companies and departments with similar characteristics operating in similar environments. To facilitate generalizable conclusions, the discussion starts with a holistic take on onboarding processes before discussing concrete onboarding barriers and initiatives to mitigate their impact on onboarding quality and efficiency.

5.1 Designing Onboarding Processes

RQ1: What processes are in place for onboarding new employees?

Successful onboarding processes target both learning and social integration (Bauer & Erdogan, 2011; Davila & Pina-Ramirez, 2018). This process is also referred to as becoming an "Organizational insider", which includes gaining organizational knowledge, developing role-specific skills, and understanding the organizational culture (Sharma & Stol, 2020). The learning process to acquire the needed knowledge can be structured in multiple ways depending on the learning environment. For complex environments where learners have high cognitive maturity, like the case study environment, Ramburuth and Daniel (2011) highlight experiential learning theory as a viable way of structuring the learning process. Experiential learning theory is based on iteratively transforming experiences into knowledge (A. Kolb & Kolb, 2011), which can be visualized with Kolb's Experiential Learning Cycle; see Figure 2.2.

5.1.1 Onboarding Methods and Tools

Buchan et al. (2019) identifies multiple methods and tools that can be utilized in onboarding processes in agile software development; see Table 2.1. The methods and tools presented by Buchan et al. (2019) vary in both themes and size, ranging from mentorship as an overarching method for onboarding structure to checklists as a tool. The methods and tools can be categorized into onboarding structure, increase Understanding, technical skills, social interactions, and tools; see Table 5.1.

Table 5.1: Methods & tools categorized into themes.

Theme	Methods & Tools
Onboarding Structure	Mentorship
Increase Understanding	Training Courses Product Overview
Technical Skills	Code Review Pair Programming Simple Tasks
Social Interactions	Stand-Ups Team Retrospectives Team / Peer Support
Tools	Internal Documentation Online Communities Checklists

Onboarding Structure
Mentorship can fill different roles in an onboarding process. It is commonly used for both helping mentees learn role-specific knowledge and guiding social norms and social integrations (Buchan et al., 2019). Hamlin and Sage (2011) highlight that both mentor's and mentee's characteristics and behavior are equally important and that acquiring the needed skills generally requires formal learning. There are currently no formal ways mentors and mentees get trained to maximize mentorship efficiency for onboarding outside the EYW program. Creating a situation where the onboarding conditions for success vary based on each mentor and mentee.

Davila and Pina-Ramirez (2018) further recommend that a mentor should have over three years of experience within the company to create good conditions for onboarding success. Based on the case study, it has been shown that onboarding success isn't purely dependent on mentor experience. Multiple mentees who have had junior mentors have highlighted the lower seniority as a positive aspect, as the mentors can better relate to their mentees.

These findings emphasize that the role of the mentor needs to be clearly defined and interpreted similarly throughout the organization. Depending on the span of responsibility of mentors, two different mentor roles have been identified. The first option is to have a senior mentor manage onboarding 1-on-1 and thereby take holistic responsibility for the process. The second option is to use a 2-on-1 mentorship where a junior mentor manages questions and social integration, with a senior mentor or manager overseeing the process. In the case of a mentor only managing questions and social integration, the role of managing the onboarding process is either put on the closest manager or a senior employee.

The goal of using a 1-on-1 mentorship model with a senior mentor is to have a mentor who deeply understands the business complexity, which is the most challenging part to learn during the onboarding at the Case Company. The downside is that

it is both resource-consuming and potentially difficult to find enough mentors with the needed skills, creating a need to develop a structured process of creating skilled mentors. This mentorship model further decreases productivity for a senior team member, who usually are more integral to project deliveries than junior team members. However, the clear strength is that the mentor can handle most questions and contribute with high expertise and holistic understanding to the onboarding process

Customizing the mentorship can be an effective and efficient technique to help mentees become value-adding and autonomous (Buchan et al., 2019; Sharma & Stol, 2020). It is further stated by Steinmacher et al. (2014) that a good mentor increases the retention rate of new employees. This emphasizes the need to keep mentorship as the core of the Case Company's onboarding process while adjusting the roles to match their mentorship strategy. Based on the strengths and weaknesses of each mentorship strategy, it is recommended to use more junior mentors. This option matches the Case Company's future demand during increased recruitment and reduces the currently experienced strain on mentors.

Increase Understanding
The two methods mainly related to increasing understanding are training courses and product overviews. Buchan et al. (2019) states that courses are essential to learning organizations' key technologies and can either be formal courses or self-directed learning initiatives. The Case Company's training courses are designed for customers, reducing their applicability for onboarding new employees. However, the courses are generally appreciated by mentees, whose main critique regards that courses can't consider individual onboarding processes when scheduling. Buchan et al. (2019) also highlight that it is critical to receive formal introduction courses when starting. Which is something the Case Company has early on in their onboarding processes.

A product overview is further highlighted by Buchan et al. (2019) as important for increasing understanding and giving employees a better understanding of the business context. According to Ju et al. (2021), it is a method that makes continued learning less ambiguous for new employees. The Case Company currently includes product overviews in its courses. Still, due to their high business complexity, a deeper understanding of the business than what a product overview enables would be necessary.

Technical Skills
Code reviews, pair programming, and simple tasks target technical skills highlighted by Buchan et al. (2019). Code reviews ensure that the code meets all requirements and that the delivered code is of high quality (McIntosh et al., 2016). Buchan et al. (2019) further highlights understanding code base design, coding standards, and norms as positive aspects of using code reviews during onboarding. Respondents have also highlighted code reviews as a source of technical learning through getting code reviewed and reviewing others' code. Therefore, all mentees should get and conduct code reviews to maximize learning. This method has mainly been influen-

tial in learning after the first month, as a certain code level and understanding are needed to benefit from code reviews.

Simple tasks are a method used to familiarize with the team's ways of working and assess knowledge gaps (Buchan et al., 2019). Simple tasks have not always been available for all mentees, mainly due to the impact different project phases have on the difficulty of Jira tickets (Tasks organized in the digital agile project management tool). When joining projects in late project stages, mentees have experienced a lack of simple tasks, impacting their learning curve negatively. Therefore, it is recommended to have simple tasks or a simulation environment prepared to enable mentees to work with tasks of appropriate difficulty.

The final method Buchan et al. (2019) identifies for increased technical skill is pair programming. Pair programming at the Case Company is primarily done between the mentor and mentee. Enabling quick feedback from the mentor but resulting in the mentorship being time-consuming. The learning outcomes from pair programming have been highlighted as positive, and respondents who haven't used it have stated that they have missed it. Pair programming is argued to improve productivity, code quality, knowledge transfer, and learning (Banić et al., 2023; Hannay et al., 2009). There are, however, question marks regarding its impact on productivity and code quality due to potential research biases (Hannay et al., 2009; Hulkko & Abrahamsson, 2005). It is, despite question marks regarding the impact on productivity and code quality, shown that pair programming facilitates increased learning and knowledge transfer (Hanks et al., 2011; Hulkko & Abrahamsson, 2005), making it appropriate for learning in onboarding processes.

Social Interactions
Respondents have emphasized socialization as well-working and impactful on learning during onboarding. Three methods used for social interactions are stand-ups, team retrospectives, and team/peer support (Buchan et al., 2019). Daily stand-ups are a good opportunity for new employees to ask questions and get feedback (Gregory et al., 2022). Respondents have further emphasized that it gives good insight into how projects are run and increases socialization. Retrospectives is another good forum to ask questions and reflect (Buchan et al., 2019), facilitating increased understanding and social integration for new employees.

Ju et al. (2021) show that team support is another important method during onboarding, as it enables questions, helps with tasks, and increases employee confidence. For the Case Company, it has further been shown that it is a critical aspect to reduce the workload for the mentor and enable every team member to contribute with their individual expertise.

Tools
Buchan et al. (2019) highlights internal documentation, online communities, and checklists as important tools during onboarding. Internal documentation is used to capture local knowledge and is used to make all necessary information available for

the mentees (Buchan et al., 2019). At the Case Company, there is a lot of internal documentation available. The challenge regarding internal documentation has been difficult navigation, reducing the upside of having internal documentation available during onboarding.

Instead of using internal documentation, many respondents have preferred online communities as they enable more direct answers. Ju et al. (2021) found that online communities helped create successful onboarding by facilitating a good forum for asking questions. The main challenge respondents at the Case Company highlighted was daring to ask questions over Slack (Cloud-based tool for individual and group communication) in the beginning.

The final tool for onboarding identified by Buchan et al. (2019) was checklists. Checklists can create an onboarding structure and ensure that important activities aren't forgotten (Buchan et al., 2019). The Case Company's checklist in Gothenburg has had limited use during onboarding as it hasn't been experienced as sufficiently helpful for mentors. Based on the benchmark study, a big difference was found in Singapore, where their checklist was formulated in a way that clearly stated expected activities and responsibilities. This led to the checklist being experienced as more useful and a good source of inspiration for other sites at the Case Company.

Customer Interaction
One method highlighted by respondents that the literature hasn't emphasized as much is the impact of customer interaction or, preferably, customer visits. Respondents highlighted customer visits as a source of inspiration and a great method for increased business understanding. Ju et al. (2021) emphasizes hands-on experience and holistic understanding as crucial aspects of reducing business complexity. Therefore, including customer visits and customer contact in the onboarding process can mitigate challenges with the inherent complexity.

5.1.2 Methods and Tools for Learning

The methods and tools used for onboarding new personnel have different characteristics. Usually focusing on creating an experience, enabling reflection and conceptualization, or facilitating experimentation. This enables mapping the discussed methods and tools around Kolb's experiential learning cycle to create comprehensive learning during the onboarding; see Figure 5.1. It is important to note that the cycle is iterative and that the steps of the cycle can be completed in multiple ways (A. Kolb & Kolb, 2011), enabling other methods and tools to be used while emphasizing that they best work iteratively. Customer visits, socialization, checklists, and internal documentation are assessed as the methods and tools facilitating experiences and insights. The biggest experience of those is the customer visits, where the most insights are created. Reflection, thinking, and acting are then done based on the experiences (A. Kolb & Kolb, 2011). Reflective observations can be made using team support, code reviews, stand-ups, or retrospectives. The goal would be to understand the previous experience better. Similar methods and tools can then

be used for abstract conceptualization in the "thinking"-step, only swapping team support for online communities. Based on these new insights, active experimentation can be done through pair programming or simple tasks.

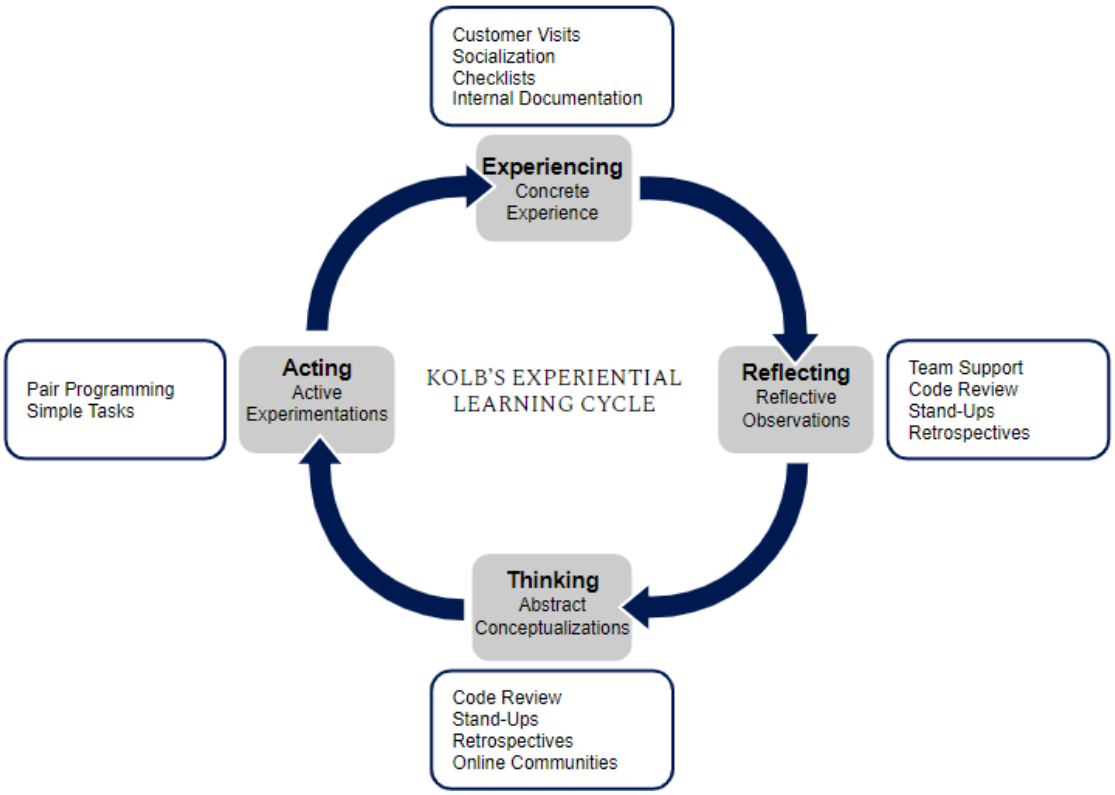

Figure 5.1: Onboarding methods & tools mapped on Kolb's experiential learning cycle.

Mentorship and training courses are not specified to a specific step of the learning cycle, as they should include all steps for more comprehensive learning. This means that the learning cycle presented by A. Kolb and Kolb (2011) should be an integrated part of creating course content and mentorship structure, ensuring that the model is a central part of their learning strategy throughout the onboarding process.

Based on the mapping of methods and tools in Figure 5.1, it becomes evident that there are no significant gaps in the methods and tools used during onboarding. However, as the methods and tools are compiled based on 24 respondents, very few onboardings used all methods and tools efficiently. Creating a need for ensuring that all methods and tools are understood and implemented correctly in each onboarding process. To use these methods and tools efficiently, it will be further essential to understand their impact in different onboarding phases and how to schedule them.

5.1.3 Scheduled Onboarding Methods

Respondents highlighted that current methods and tools are experienced as differently impactful depending on when they are utilized. Based on their answers during

the survey study, current methods and tools could be mapped; see Figure 4.2. This compilation of currently used methods and tools is based on all respondents, showing where they had experienced the most significant impact of each method. As the current standardization is low, very few mentees had their onboarding structured according to the schedule visualized in Figure 4.2.

To align the scheduling of methods and tools with the ambitions of the Case Company, an updated schedule of onboarding methods and tools is created; see Figure 5.2. The changes emphasize that customer contact should be included earlier while lengthening the course time to decrease the risk of information overload. The goal is to facilitate the creation of a standardized core where understanding of the methods and tools used and their impact on learning is mutually understood by all stakeholders.

Figure 5.2: Onboarding methods & tools integrated into the four phases of the onboarding process.

5.2 Onboarding Barriers

RQ2: What are the barriers to learning associated with an onboarding process?

Previous barriers identified by literature correlate in some aspects to the onboarding barriers identified at the Case Company. The main barriers identified in literature regarding agile ways of working were low customer interaction, knowledge sharing between teams, and remote work. The main barriers to OSS projects were social interaction, newcomers' previous knowledge, code issues, documentation issues, finding a way to start, time management, and process variation. Compared to the literature, the barriers identified at Case Company are within the areas of process variation, business complexity, socialization, mentorship, and courses. These barriers are, to some extent, also touched upon by literature. However, the literature discusses barriers from an agile project development or OSS project point of view. Some differences and similarities can be drawn between those two contexts and the

context of the Case Company. The primary distinction among the three contexts is that the Case Company is not an open-source entity but rather a company developing products in-house with a unique in-house programming language. Nevertheless, since their product is based on code and algorithms, new employees encounter challenges similar to those new software developers face in OSS projects. Moreover, the Case Company works with coding in an agile project-based structure, where their daily operations are structured with agile methods, such as stand-ups and retrospectives. Therefore, the literature can help give a broader perspective on the challenge and help understand what causes similar barriers at the Case Company. All barriers identified in the literature and at the Case Company are listed below in table 5.2.

Table 5.2: Onboarding barriers compared to literature. References highlight research identifying barriers within agile teams or OSS projects. Present barriers at the Case Company are visualized by categorizing them by the presence in interviews with: "Low", "Medium", and "High".

Barriers	**Agile Teams**	**OSS**	**Case Company**
Business Complexity	-	(Balali et al., 2018; Steinmacher et al., 2014)	High
Documentation Issues	-	(Rodeghero et al., 2021; Steinmacher et al., 2014)	High
Code Issues	-	(Steinmacher et al., 2014)	-
Course Related	-	-	Medium
Finding a Way to Start	-	(Steinmacher et al., 2014)	-
Knowledge Sharing	(Babb et al., 2013)	(Steinmacher et al., 2014)	High
Low Customer Interaction	(Dagenais et al., 2010)	-	Medium
Mentorship Related	-	(Steinmacher et al., 2014)	Medium
Newcomers Previous Knowledge	-	(Balali et al., 2018; Fichman & Kemerer, 1997; Steinmacher et al., 2014)	Medium
Process Variation	-	(Balali et al., 2018)	High
Remote work	(Petrilli et al., 2022; Rodeghero et al., 2021)	-	Low
Socialization	(Babb et al., 2013)	(Steinmacher et al., 2014)	Low
Time Management	-	(Balali et al., 2018)	Medium

As displayed in the Case Company column, almost all barriers have, to some degree, been experienced by either a mentee or mentor. However, their impact and presence have varied, resulting in a categorization from low to high presence. Finding a way to start and code issues has not been evident as significant barriers in terms of onboarding. Some challenges related to the project stage and business complexity may initially pose difficulties. However, tasks are available, ensuring that all new employees at the Case Company have work assignments from day one.

Moreover, as shown in Table 5.2, course-related barriers were identified at the Case Company, a challenge not previously discussed in the literature about onboarding into either agile teams or OSS projects. Courses are an essential part of the onboarding at the Case Company. Nevertheless, as described in chapter 4.3.2, challenges with information overload, prerequisites, and schedules are tightly connected to the course-related barriers at the Case Company. The feeling of information overload connected to programming and learning has previously been identified by Steinmacher et al. (2014) as a challenge connected to poorly documented information. To minimize the risk of information overload in internal documents and course structures, it is crucial to investigate ways to organize them for easier comprehension and to avoid overwhelming new employees. Furthermore, low customer interaction was identified by Babb et al. (2013) as one main barrier when working in agile teams. The impact of customer interaction and its positive effects in terms of better understanding the context and minimizing business complexity were highlighted by both mentors and mentees at the Case company. This is supported by Dagenais et al. (2010), who show a connection between customer interaction and time to productivity within agile projects. Moreover, remote work was identified by Babb et al. (2013), Petrilli et al. (2022), and Rodeghero et al. (2021) and by the Case Company as a barrier. Mentees expressed that it would be beneficial if the mentor and mentee could be on-site during the first onboarding period, as it positively impacts learning and socialization.

Besides the stated differences between literature and Case Company, the remaining barriers stated by Balali et al. (2018) and Steinmacher et al. (2014) are common for both OSS projects and the onboarding at Case Company. In a programming context, it is evident that whether or not it is open-source programming or programming internally, there are learning barriers in terms of socialization, knowledge gaps, knowledge sharing, documentation issues, process variation, time management, mentorship, and business complexity. All barriers identified are not applicable in the agile project-based context. However, knowledge sharing, socialization, and previous knowledge are barriers to onboarding in all three contexts.

5.3 Initiatives for Improved Onboarding Processes

RQ3: What initiatives can be undertaken to elevate the quality and efficiency of the onboarding process?

Considering the barriers identified through this study, three main improvement areas have been identified as crucial initiatives to achieve increased onboarding quality and efficiency. Firstly, a formalized onboarding process, including clarified mentor responsibility, should be ensured. Secondly, the current course structure and available learning alternatives should be addressed through mentee-centered learning. Lastly, targeting the inherent business complexity within the Case Company. These improvement initiatives are the primary recommendations derived from this study.

Formalized Process and Mentor Role
The current mentorship has a high variation depending on who the mentor is due to low standardization and different interpretations of the mentor role and its responsibilities. The internal documentation states that a mentor should assign 1 hour per day to mentorship, which equals 8% of a business week. However, the study shows that most mentors devote approximately 25-50% of their time to the mentorship. The varied interpretations of what is expected from the mentor result in a high variation in what the different mentors deliver. However, it is essential to note that no mentorship could be 100% identical, as there must be adaptation based on mentee needs and mentor strengths.

Moreover, mentors primarily draw learnings from within their project teams, creating knowledge silos. Knowledge sharing has been highlighted by Babb et al. (2013) as a barrier to learning in agile teams, emphasizing the need for cross-functional knowledge sharing to improve the current working methods. Therefore, by creating a shared mentors forum, the mentors could share information between teams and learn from each other's knowledge and insights.

To achieve long-term improvements and enable scale-up, a more formalized onboarding program should be implemented (Bauer, 2010). New employees undergoing a more formalized onboarding with a clear structure result in a higher success rate (Britto et al., 2020). Creating a successful mentorship is essential in achieving efficient onboarding processes (Sharma & Stol, 2020). The proposal is therefor to standardizing the core of the mentorship program and formalizing it to enhance efficiency. By ensuring that mentors and mentees have the necessary prerequisites, the Case Company can streamline the process and optimize the use of resources. It would be critical that all stakeholders have a shared understanding and interpretation of the responsibilities assigned to each role.

Mentee-Centered Learning
All new employees have different backgrounds and prerequisites; nevertheless, there have been some common challenges, such as being overwhelmed and having too much information to grasp in the beginning. The challenge at hand is that there are a lot of courses available and courses necessary to take to learn and understand the role. However, the physical courses offered at the Case Company are designed for the customers and are, therefore, not always available. To address this, we suggest an initiative where courses are offered as digital resources. Thus, new employees can take the courses at their own pace and when suitable for them. It will further mitigate the risk of low attendance on the available courses and free up resources. On the downside, this takes away the chance of physical interactions and socialization. Therefore, it would be recommended to complement the courses with Q&A sessions or workshops, facilitating deeper discussions with senior experts to increase learning. Moreover, this will free up resources and increase flexibility regarding when to conduct the workshops as it is less time-consuming compared to the physical courses. Subsequently, this can lead to mentees having more time for learning and social integration in the beginning.

Business Complexity
Business complexity has been identified as one of the major barriers to becoming a productive team member. The inherent business complexity comprises aviation industry complexity, complex products, and the impact of joining late project stages. Respondents have unanimously highlighted the aviation industry understanding as the most challenging area to learn if you lack previous experience. To ease aviation industry learning, a structured aviation industry introduction is needed. This is currently done through digital skills library courses, which haven't succeeded in fully bridging the knowledge gap to achieve sufficient prerequisites to understand business processes and maximize learning from academy courses. Therefore, early customer contact and visits are recommended to complement the skills library courses to create a learning experience and deepen mentees' understanding of their customers and business processes. This, combined with increased mentee adaptability through expert Q&As, aims to reduce the business complexity challenges regarding aviation industry understanding.

The project and product complexity further impacts the business complexity experienced by mentees. Therefore, it would be positive to aim to onboard mentees to lower-complexity projects, which usually are projects in earlier phases or less complex products. Starting with less complex products creates an additional challenge of moving more senior employees to more complex products. As these moves can have complications regarding lost competence, focusing on early project stages would be the recommended action to reduce project complexity during onboarding.

Finally, the experienced business complexity is connected to the internal documentation, which has been described as hard to navigate. By structuring the documentation in a way that matches the learning process of new employees, the complexity can be experienced as lower. Enabling more individual learning through easily navigated internal documentation would further make the onboarding less time-consuming for mentors, thereby making it a more scalable process.

6
Conclusion

This study investigated how to improve the quality and efficiency of onboarding processes at IT companies and evaluate methods and tools utilized for learning and onboarding. To achieve this, current onboarding barriers were analyzed through a case study.

RQ1: What processes are in place for onboarding new employees?

Currently, the Case Company has two different onboarding processes: Earn Your Wings, which is organized with Nexer, and individual onboarding, which the Case Company organizes. The onboarding processes are mainly based on mentorship and academy courses. No onboarding should be identical to account for individual differences and varied knowledge levels. However, the process variation has been experienced as greater than necessary, mainly due to mixed interpretations of mentorship structure and mentors' roles. This variation makes the process hard to accurately evaluate regarding time to productivity and improvement initiatives' impact.

RQ2: What are the barriers to learning associated with an onboarding process?

Five main areas of barriers were identified at the Case Company: process variation, mentorship, courses, business complexity, and socialization. These barriers are identified as important areas to be cautious of when improving onboarding in terms of quality and efficiency. Firstly, due to limited clarity regarding the onboarding process, a high process variation has been experienced at the Case Company. This has further led to a greater variety in mentorship, where knowledge sharing between mentors, remote work, and structure has been experienced mentorship-related barriers. Secondly, the barriers related to academy courses were primarily focused on scheduling, information overload, and unclear prerequisites. Emphasizing the need for a more seamless integration of courses in the onboarding process. Moreover, grasping the aviation industry and product complexity constituted major business complexity barriers to becoming self-sufficient. Lastly, socialization is essential to becoming confident in a role. The inclusive culture at the Case Company has contributed to successful socialization. Nevertheless, keeping the potential barriers within remote work and collective onboarding in mind is important to create an efficient and optimized onboarding.

RQ3: What initiatives can be undertaken to elevate the quality and efficiency of the onboarding process?

Optimizing the onboarding process requires multiple initiatives, with the common goal of enhancing quality and efficiency through formalization. The three initiatives assessed as most impactful on the onboarding targets are formalized process, mentee-centered learning, and reduced business complexity. Firstly, addressing the mentorship structure with a formalized process creates a support structure for mentors, facilitating equal conditions for onboarding success. The role of the mentors will further need to be formalized to create clear areas of responsibility for the process stakeholders. Secondly, addressing the current course-related barriers with more online courses complemented with workshops and Q&A to facilitate discussion with experts aims to create a more mentee-centered onboarding and increased resource efficiency. Lastly, new employees should initially be included in lower-complexity projects and introduced to customers early to decrease the experienced business complexity. It is further recommended that new employees be included in customer visits and interactions to create a learning experience that facilitates learning based on the experiential learning cycle. To enhance the quality and efficiency of the onboarding process, it is crucial to recognize that the initiatives are closely interconnected and will achieve maximum effectiveness when implemented collectively.

6.1 Limitations

Due to the case study being conducted at a single organization, some limitations on generalizability are inherent. To some extent, these limitations have been mitigated through a benchmark study in Montreal and Singapore. One remaining limitation lies in the culture's impact on onboarding processes, limiting generalizability to organizations and countries with distinct and unique cultures. It is further important to note that the barriers and initiatives identified might have lower applicability in settings where the needed competencies are recruitable or where the inherent business complexity is lower.

Furthermore, optimizing individual learning through learning styles and personalities has been left outside the study's scope, potentially impacting identified barriers and recommended actions. The impact of emerging technologies, such as AI, on onboarding processes has not been the primary focus of this study. Resulting in a need for future research to evaluate its impact on both onboarding processes and this study's findings.

6.2 Future Research

The scope and time constraints of the study enable future studies to gain a more comprehensive understanding of the optimization of onboarding processes. Due to time constraints, implementing and testing the theory was not feasible. Therefore, conducting a longitudinal study, researching the implications and effects of imple-

menting the suggested initiatives, and evaluating the methods and tools in the specific environment would be recommended. It would further be beneficial to broaden the scope to include all departments and sites to research how to streamline the onboarding process for a whole organization. Researching the whole organization would be more time-consuming, but it would enable the study to include economies of scale and potential implications of having different onboarding processes between the departments. This study mainly used other sites for benchmarking; incorporating them more closely would require an increased focus on cultural differences.

It would further be beneficial for organizations to consider incorporating different learning styles in the onboarding processes. Learning styles can be efficiently integrated with the learning theory presented in chapter 2.5. However, further research regarding the adaptation of the onboarding process to facilitate the integration of learning styles would be needed. By expanding the scope of learning, optimization of continuous professional development after the onboarding process could be researched and connected to onboarding research. This potentially results in a holistic learning process arching both onboarding and continuous development.

Finally, the role of AI in optimized onboarding processes should be researched further. Respondents have frequently highlighted AI as an intriguing tool for onboarding but with a need for extensive research that wasn't within the scope of this master thesis. Throughout the interview study, respondents highlighted AI pair programming, documentation navigation, and AI as a teacher as three areas where AI could have an impact. Current literature on AI co-pilot for pair programming shows limitations and that it isn't a quick fix for onboarding processes. Similar findings could likely be seen by researching other usage areas of AI, emphasizing the need for a robust onboarding process where AI can be a tool rather than the whole solution. Future research on the subject would be necessary to gain a more in-depth understanding of AI's implications on onboarding processes.

Bibliography

Ahmad, S., Sultana, N., & Jamil, S. (2020). Behaviorism vs constructivism: A paradigm shift from traditional to alternative assessment techniques. *Journal of Applied Linguistics and Language Research*, *7*(2), 19–33. https://api.semanticscholar.org/CorpusID:214706863

Andriyani, Y., Hoda, R., & Amor, R. (2017). Reflection in agile retrospectives. In H. Baumeister, H. Lichter, & M. Riebisch (Eds.), *Agile processes in software engineering and extreme programming: 18th international conference, xp 2017* (pp. 3–19). Springer International Publishing. https://doi.org/10.1007/978-3-319-57633-6

Babb, J. S., Hoda, R., & Nørbjerg, J. (2013). Barriers to learning in agile software development projects. In H. Baumeister & B. Weber (Eds.), *Agile processes in software engineering and extreme programming: 14th international conference, xp 2013* (pp. 1–15). Springer. https://doi.org/10.1007/978-3-642-38314-4_1

Balali, S., Steinmacher, I., Annamalai, U., Sarma, A., & Gerosa, M. A. (2018). Newcomers' barriers... is that all? an analysis of mentors' and newcomers' barriers in oss projects. *Computer Supported Cooperative Work (CSCW)*, *27*, 679–714. https://doi.org/10.1007/s10606-018-9310-8

Banić, B., Konecki, M., & Konecki, M. (2023). Pair programming education aided by chatgpt. In *2023 46th mipro ict and electronics convention (mipro)* (pp. 911–915). IEEE. https://doi.org/10.23919/MIPRO57284.2023.10159727

Bauer, T. N. (2010). Onboarding new employees: Maximizing success. *SHRM Foundation's Effective Practice Guidelines Series*, 1–54. https://www.researchgate.net/publication/336409384_SHRM_Foundation's_Effective_Practice_Guidelines_Series_Onboarding_New_Employees_Maximizing_Success

Bauer, T. N., & Erdogan, B. (2011). Organizational socialization: The effective onboarding of new employees. In S. Zedeck (Ed.), *Apa handbook of industrial and organizational psychology. maintaining, expanding, and contracting the organization* (3rd ed., pp. 51–64). American Psychological Association. https://doi.org/10.1037/12171-002

Bell, E., Bryman, A., & Harley, B. (2022). *Business research methods* (6th ed.). Oxford University Press.

Bird, C., Ford, D., Zimmermann, T., Forsgren, N., Kalliamvakou, E., Lowdermilk, T., & Gazit, I. (2022). Taking flight with copilot: Early insights and opportunities of ai-powered pair-programming tools. *Queue*, *20*(6), 35–57. https://doi.org/10.1145/3582083

Bridges, J., Gray, W., Box, G., & Machin, S. (2008). Discovery interviews: A mechanism for user involvement. *International journal of older people nursing*, *3*(3), 206–210. https://doi.org/10.1111/j.1748-3743.2008.00128.x

Britto, R., Cruzes, D. S., Smite, D., & Sablis, A. (2018). Onboarding software developers and teams in three globally distributed legacy projects: A multi-case study. *Journal of Software: Evolution and Process*, *30*(4). https://doi.org/10.1002/smr.1921

Britto, R., Smite, D., Damm, L.-O., & Börstler, J. (2020). Evaluating and strategizing the onboarding of software developers in large-scale globally distributed projects. *Journal of Systems and Software*, *169*(1). https://doi.org/10.1016/j.jss.2020.110699

Buchan, J., MacDonell, S. G., & Yang, J. (2019). Effective team onboarding in agile software development: Techniques and goals. In *2019 acm/ieee international symposium on empirical software engineering and measurement (esem)* (pp. 1–11). IEEE. https://doi.org/10.1109/ESEM.2019.8870189

Cambridge Dictionary. (n.d.). *Onboarding*. Cambridge University Press. https://dictionary.cambridge.org/dictionary/english/onboarding

Cawyer, C. S., & Friedrich, G. W. (1998). Organizational socialization: Processes for new communication faculty. *Communication Education*, *47*(3), 234–245. https://doi.org/10.1080/03634529809379128

Dagenais, B., Ossher, H., Bellamy, R. K., Robillard, M. P., & De Vries, J. P. (2010). Moving into a new software project landscape. In *In proceedings of the 32nd acm/ieee international conference on software engineering* (pp. 275–284). Association for Computing Machinery. https://doi.org/10.1145/1806799.1806842

Davila, N., & Pina-Ramirez, W. (2018). *Effective onboarding*. ATD Press.

DeJovine, B. B., & Harris, E. R. (2001). Developing the mentor/protégé relationship. *Healthcare Executive*, *16*(4), 52–52. https://www.proquest.com/trade-journals/developing-mentor-protege-relationship/docview/200333501/se-2?accountid=26301

Eby, L. T., Rhodes, J. E., & Allen, T. D. (2007). Definition and evolution of mentoring. In L. T. Eby & T. D. Allen (Eds.), *The blackwell handbook of mentoring: A multiple perspectives approach* (pp. 7–20). Blackwell Publishing Ltd. https://doi.org/10.1111/b.9781405133739.2007.x

Fichman, R. G., & Kemerer, C. F. (1997). The assimilation of software process innovations: An organizational learning perspective. *Management science*, *43*(10), 1345–1363. https://doi.org/10.1287/mnsc.43.10.1345

Ghosh, R. (2013). Mentors providing challenge and support: Integrating concepts from teacher mentoring in education and organizational mentoring in business. *Human Resource Development Review*, *12*(2), 144–176. https://doi.org/10.1177/1534484312465608

Graybill, J. O., Taesil Hudson Carpenter, M., Offord Jr, J., Piorun, M., & Shaffer, G. (2013). Employee onboarding: Identification of best practices in acrl libraries. *Library Management*, *34*(3), 200–218. https://doi.org/10.1108/01435121311310897

Gregory, P., Strode, D. E., Sharp, H., & Barroca, L. (2022). An onboarding model for integrating newcomers into agile project teams. *Information and Software Technology*, *143*. https://doi.org/10.1016/j.infsof.2021.106792

Hamlin, R. G., & Sage, L. (2011). Behavioural criteria of perceived mentoring effectiveness: An empirical study of effective and ineffective mentor and mentee behaviour within formal mentoring relationships. *Journal of European Industrial Training*, *35*(8), 752–778. https://doi.org/10.1108/03090591111168311

Hanks, B., Fitzgerald, S., McCauley, R., Murphy, L., & Zander, C. (2011). Pair programming in education: A literature review. *Computer Science Education*, *21*(2), 135–173. https://doi.org/10.1080/08993408.2011.579808

Hannay, J. E., Dybå, T., Arisholm, E., & Sjøberg, D. I. (2009). The effectiveness of pair programming: A meta-analysis. *Information and software technology*, *51*(7). https://doi.org/10.1016/j.infsof.2009.02.001

Hegstad, C. D., & Wentling, R. M. (2005). Organizational antecedents and moderators that impact on the effectiveness of exemplary formal mentoring programs in fortune 500 companies in the united states. *Human Resource Development International*, *8*(4), 467–487. https://doi.org/10.1080/13678860500199808

Hulkko, H., & Abrahamsson, P. (2005). A multiple case study on the impact of pair programming on product quality. In G.-C. Roman (Ed.), *Proceedings of the 27th international conference on software engineering* (pp. 495–504). Association for Computing Machinery. https://doi.org/10.1145/1062455.1062545

Jacobsen, D. I., Thorsvik, J., Sandin, G., & Larson, P. (2021). *Hur moderna organisationer fungerar* (5th ed.). Studentlitteratur.

Johnson, M., & Senges, M. (2010). Learning to be a programmer in a complex organization: A case study on practice-based learning during the onboarding process at google. *Journal of Workplace Learning*, *22*(3), 180–194. https://doi.org/10.1108/13665621011028620

Jones, G. R. (1986). Socialization tactics, self-efficacy, and newcomers' adjustments to organizations. *Academy of Management journal*, *29*(2), 262–279. https://doi.org/10.5465/256188

Ju, A., Sajnani, H., Kelly, S., & Herzig, K. (2021). A case study of onboarding in software teams: Tasks and strategies. In *2021 ieee/acm 43rd international conference on software engineering (icse)* (pp. 613–623). IEEE. https://doi.org/10.1109/ICSE43902.2021.00063

Kolb, A., & Kolb, D. (2011). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. *The SAGE handbook of management learning, education and development*, *7*(2), 42–68. https://doi.org/10.4135/9780857021038.n3

Kolb, A., & Kolb, D. (2018). Eight important things to know about the experiential learning cycle. *Australian educational leader*, *40*(3), 8–14. https://doi.org/10.3316/informit.192540196827567

Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development.* Prentice-Hall.

London, M., & Sessa, V. I. (2006). Continuous learning in organizations: A living systems analysis of individual, group, and organization learning. In F. Yammarino & F. Dansereau (Eds.), *Multi-level issues in social systems* (5th ed., pp. 123–172). Emerald Group Publishing Limited. https://doi.org/10.1016/S1475-9144(06)05006-5

McIntosh, S., Kamei, Y., Adams, B., & Hassan, A. E. (2016). An empirical study of the impact of modern code review practices on software quality. *Empirical Software Engineering*, *21*(1), 2146–2189. https://doi.org/10.1007/s10664-015-9381-9

Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative data analysis : A methods sourcebook* (4th ed.). SAGE.

Mordi, A., & Schoop, M. (2020). Making it tangible-creating a definition of agile mindset. In F. Rowe, R. El Amrani, M. Limayem, S. Newell, N. Pouloudi, E. Van Heck, & A. El Quammah (Eds.), *28th european conference on infor-*

mation systems - liberty, equality, and fraternity in a digitizing world. ECIS. https://aisel.aisnet.org/ecis2020_rp/175

Mullen, C. A., & Klimaitis, C. C. (2021). Defining mentoring: A literature review of issues, types, and applications. *Annals of the New York Academy of Sciences*, *1483*(1), 19–35. https://doi.org/10.1111/nyas.14176

Park, Y., & Jensen, C. (2009). Beyond pretty pictures: Examining the benefits of code visualization for open source newcomers. In *2009 5th ieee international workshop on visualizing software for understanding and analysis* (pp. 3–10). IEEE. https://doi.org/10.1109/VISSOF.2009.5336433

Patel, R., Davidson, B., & Jacobson, J. (2019). *Forskningsmetodikens grunder - att planera, genomföra och rapportera en undersökning* (5th ed.). MTM.

Petrilli, S., Galuppo, L., & Ripamonti, S. C. (2022). Digital onboarding: Facilitators and barriers to improve worker experience. *Sustainability*, *14*(9). https://doi.org/10.3390/su14095684

Ramburuth, P., & Daniel, S. (2011). Integrating experiential learning and cases in international business. *Journal of Teaching in International Business*, *22*(1), 38–50. https://doi.org/10.1080/08975930.2011.585917

Rodeghero, P., Zimmermann, T., Houck, B., & Ford, D. (2021). Please turn your cameras on: Remote onboarding of software developers during a pandemic. In *2021 ieee/acm 43rd international conference on software engineering: Software engineering in practice (icse-seip)* (pp. 41–50). IEEE. https://doi.org/10.1109/ICSE-SEIP52600.2021.00013

Scarbrough, H., Swan, J., Laurent, S., Bresnen, M., Edelman, L., & Newell, S. (2004). Project-based learning and the role of learning boundaries. *Organization studies*, *25*(9), 1579–1600. https://doi.org/10.1177/0170840604048001

Sharma, G. G., & Stol, K.-J. (2020). Exploring onboarding success, organizational fit, and turnover intention of software professionals. *Journal of Systems and Software*, *159*. https://doi.org/10.1016/j.jss.2019.110442

Sim, S. E., & Holt, R. C. (1998). The ramp-up problem in software projects: A case study of how software immigrants naturalize. In *Proceedings of the 20th international conference on software engineering* (pp. 361–370). IEEE. https://doi.org/10.1109/ICSE.1998.671389

Snell, A. (2006). Researching onboarding best practice: Using research to connect onboarding processes with employee satisfaction. *Strategic HR Review*, *5*(6), 32–35. https://doi.org/10.1108/14754390680000925

Steinmacher, I., Silva, M. A. G., & Gerosa, M. A. (2014). Barriers faced by newcomers to open source projects: A systematic review. In L. Corral, A. Sillittis, G. Succi, J. Vlasenko, & A. I. Wasserman (Eds.), *Open source software: Mobile open source technologies: 10th ifip wg 2.13 international conference on open source systems* (pp. 153–163). Springer. https://doi.org/10.1007/978-3-642-55128-4

Stewart, M. (2021). Understanding learning:: Theories and critique. In L. Hunt & D. Chalmers (Eds.), *University teaching in focus* (2nd ed., pp. 3–28). Routledge.

Tokarčíková, E., Malichová, E., Kucharčíková, A., & Ďurišová, M. (2020). Importance of technical and business skills for future it professionals. *Amfiteatru Economic*, *22*(54), 567–578. https://doi.org/10.24818/EA/2020/54/567

Van Maanen, J., & Schein, E. (1977). *Toward a theory of organized socialization.* Massachusetts Institute of Technology (MIT).

Wanberg, C. R., Welsh, E. T., & Hezlett, S. A. (2003). Mentoring research: A review and dynamic process model. *Research in personnel and human resources management*, *22*(1), 39–124. https://doi.org/10.1016/S0742-7301(03)22002-8

Yin, R. K. (2015). *Qualitative research from start to finish* (2nd ed.). Guilford publications.

A
Interview Guide

A.1 General Introduction

What is your role at Boeing? And how long have you worked as it?

Which team are you a part of?

- What product do you work with?
- Which customers do you work with?

Could you describe your previous backgrounds?

A.2 Mentee specific interview guide

Introduction Mentorship
How much time was spent on the mentorship?

Who was your mentor?

How long has your mentor worked at Boeing?

Has your mentor been a mentor before your mentorship?

How long would you estimate it took before you felt self-sufficient?

Mentorship Structure
Could you describe how *Boeing Flight Operations* provides support to you in your relationship with your mentor?

- Regarding: courses/learning opportunities, expectations, and activities?

Could you describe how you (together with mentor and manager) worked towards achieving the "onboarding goals"

- Including the timing and nature of these discussions

(If multiple mentees:) What are your thoughts on the dynamics and effectiveness of having multiple mentees assigned to a single mentor?

How would you describe the channels in which feedback is communicated?

- How frequently does it take place?
- In what situations/contexts is it conducted?

Onboarding Process
Could you describe the onboarding process and its phases?

Could you describe the courses you have completed as part of the onboarding process?

Questions regarding project maturity

- At what stage of maturity was the first project you were involved in as a new employee?
- Could you describe both the challenges and the positive aspects you experienced at this stage of the project?"
- Could you describe which tasks was assigned to you in the project?

What is your estimate of the time required for you to reach a point where you both contribute value and operate independently?

- Is there a difference between products?

What factors do you believe contribute to the duration of the onboarding process?

Could you discuss any potential challenges or obstacles you faced during the onboarding process and how you addressed them?

How would you evaluate the balance between the pace of onboarding, and the availability of productive activities to minimize idle time?

Could you highlight the positive aspects of the onboarding process from the perspectives of the individual new employee, the team, and the mentor, detailing how each benefits from this experience?

Could you suggest any improvements for the onboarding process?

Socialization - And becoming integrated into a new team

Could you describe your experience with integrating into the team and culture, including the timeline for this process?

Is there anything you want to add that we haven't touched upon? Or areas that we can examine further during our thesis?

A.3 Mentor specific interview guide

Introduction Mentorship
How many times have you been a mentor?

How much time have you put aside for the mentorship?

How long did you work at *Boeing Flight Oeprations* before becoming a mentor?

Which products were the first your mentee/ mentees introduced to?

How long time would you estimate it took for your mentee to become self-sufficient?

Mentorship Structure

Could you describe your previous knowledge of mentoring?

Could you describe how *Boeing Flight Operations* provides support to you in your role as a mentor?

- Regarding: courses/learning opportunities, expectations, and activities?

Can you describe how you set and communicated performance expectations with your mentee, and how you both worked together to achieve their onboarding goals?

- Regarding the timing and nature of these discussions

How would you describe the channels in which feedback is communicated?

- How frequently does it take place?
- In what situations/contexts is it conducted?

Onboarding Process
Could you describe the onboarding process and its phases?

Questions regarding project maturity
- At what stage of project maturity was the first project in which your mentee participated as a new employee?

- Could you describe both the challenges and the positive aspects your mentee experienced at this stage of the project?"

- Could you describe which tasks you assigned your mentee in the project?

What is your estimate of the time required for a mentee to reach a point where they are both contributing value and operating independently?

- Does different products affect productivity?

What factors do you believe contribute to the duration of the onboarding process?

Could you discuss any potential challenges or obstacles you faced during the onboarding process and how you addressed them?

What challenges do you think are most common for someone taking on the role of a mentor for the first time?

What challenges do you think are most common for someone taking on the role of a mentor for the first time?

How would you evaluate the balance between the pace of onboarding, and the availability of productive activities to minimize idle time?

Could you highlight the positive aspects of the onboarding process from the perspectives of the individual new employee, the team, and the mentor, detailing how each benefits from this experience?

Could you suggest any improvements for the onboarding process?

Socialization - And becoming integrated into a new team

Could you describe your experience with integrating a new employee into the team and culture, including the timeline for this process?

Could you elaborate on the impact that new team members have on the team's productivity and culture from your perspective?

Is there anything you want to add that we haven't touched upon? Or areas that we can examine further during our thesis?

B

Survey Study

B.1 Survey - Onboarding Methods and Tools

What is your name?

What team do you belong to?

What is your role?
- Mentor
- Mentee
- Other

What product did you work with during your onbording?
- Rostering (studio)
- Paring (studio)
- Tracking (Atrium)
- Manpower
- Tail-assignment (Atrium)
- Ops-control (Atrium)

During what stage of completion did you/mentee enter the first project? (In percent)
- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 80 - 90
- 90 - 100

How much time would say it took before you became self-sufficient? (In months)
- < 3
- < 6
- < 9
- < 12

Can you choose five onboarding techniques that significantly contributed to your/your mentee's productivity in the first month? *

Can you choose five onboarding techniques that significantly contributed to your/your mentee's productivity (Month 2-3)? *

Can you choose five onboarding techniques that significantly contributed to your/your mentee's productivity (Month 3-6)? *

Can you choose five onboarding techniques that significantly contributed to your/your mentee's productivity (Month 6-12)? *

Can you choose five onboarding techniques that played a crucial role in integrating you into the team and culture (Month 1-2)? *

Can you choose five onboarding techniques that played a crucial role in integrating you into the team and culture (Month 3-6)? *

* = Alternatives available to choose from:

- Mentorship
- Online Communities (Ex: Slack)
- Team Support
- Team Activities
- Training Courses
- Code Review
- Internal Documentation (Ex: Confluence)
- Pair Programing
- Checklist
- Stand-Ups
- Simple Tasks
- CSO Support
- PM Support
- Team Retrospective
- Review Expectations
- Company Introduction
- Customer Contact
- Socializing with Other Teams
- Earn Your Wings
- Gaming Room
- Other (possibility to add an option in free text)

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