"The Role of Knowledge Transfer [KT] and Mentoring Programs in Enhancing the Hybrid Onboarding Processes in Industry"

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Preface

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I, Evangelos Margaritopoulos, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the work.

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List of Symbols & Acronyms

- Architecture, Engineering, and Construction – [AEC]
- Artificial Intelligence [AI]
- Enterprise resource planning – [ERP]
- Face-to-Face – [F2F]
- Knowledge Management – [KM]
- Knowledge Sharing – [KS]
- Knowledge Transfer – [KT]
- Virtual Reality – [VR]

Abstract

Nowadays, it is a fact that there is an extremely high demand for hiring people almost every three months in the industry, so companies need to improve mentoring programs and accelerate the onboarding of new hires, particularly in hybrid work environments. This research study explores actionable interventions to enhance Knowledge Transfer [KT] using mentoring programs in the onboarding process supporting hybrid work environments, using ElvalHalcor as a case study.

After assessing the existing literature and specific models such as SECI and ADKAR, the research conducts a qualitative analysis through interviews to identify the challenges and coping strategies related to onboarding and Knowledge Transfer [KT]. These challenges, exacerbated by hybrid work models and informal onboarding processes, are addressed by proposing structured mentorship programs and advanced technologies to streamline the process.

Through the integration of suitable types of mentoring (peer, one-on-one, virtual) and incorporation of a new dual-mentor approach in the industry, combined with AI-driven tools and blockchain technology, and VR either for mentor-mentee pairing or for securing progress tracking, the industry can fill gaps in its current practices. These solutions are designed not only to enhance Knowledge Transfer [KT], boost employee engagement, and accelerate the time it takes new hires to reach full productivity but also to support a shift from traditional onboarding to a more adaptive, digital-friendly approach. By embracing digital and hybrid onboarding processes, organizations maintain synergy while investing in flexible options and interoperable software tools, promoting an agile and connected workplace.

Ultimately, the findings underscore the potential for industrial construction and manufacturing companies to enhance organizational efficiency and foster a culture of continuous learning in hybrid work environments. In an industry where complex projects demand rapid team integration, this research highlights the benefits of a structured, adaptive onboarding approach that improves safety, boosts productivity, and strengthens team cohesion from day one.

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1. Introduction

Nowadays, dozens of people begin new jobs (Arnstrand, 2023; Einar H., 2023). Also, there is no doubt that public institutions and companies should provide attractive working environments to attract new talents and to improve their retention rates. Many studies state that 1 out of 3 new hires choose to leave their organization due to the dissatisfaction an ineffective onboarding process (Borowski, 2020; Brødsjø et al., 2023; Karambelkar & Bhattacharya, 2017). Therefore, digital transformation is reshaping industries and playing a vital role in the functionality of organizations, emphasizing the need for digital and analytical skills in many jobs, especially as traditional roles in sectors like Architecture, Engineering, and Construction-[AEC] face challenges (Liu et al., 2024). This shift brings generational gaps to the fore, with differences in technology use and thinking potentially hindering collaboration and knowledge management within organizations. Embracing a workforce that includes digital-native Millennials and Generation Z can bridge these gaps, fostering innovative, flexible management practices which help the improvement of the effective onboarding process (Liu et al., 2024). Such diversity enriches teams with a variety of skills and perspectives, crucial for adapting to and thriving in a rapidly evolving digital landscape (Karambelkar & Bhattacharya, 2017; Liu et al., 2024).

It is a fact that organizations aim to offer many feasible opportunities for new employees to engage them in innovative work tasks with the long-term goal of demonstrating their skills and broadening their knowledge further. Therefore, it is necessary that newcomers should feel welcomed and supported by colleagues but at the same, they should receive suitable training and instructions to adapt to the company's needs and culture in the best way (Brødsjø et al., 2023). As a result, the onboarding process plays a vital role in the ensuring smooth and successful operation of companies.

In parallel, it is equally significant to highlight the importance of Knowledge Management – [KM] in organizations and how they are trying to transfer knowledge between employees and general departments (Davenport et al., 1998). Furthermore, it is proved that Knowledge is an intangible resource which offers high value for companies through effective use, and it is necessary to be managed optimally and dynamically to maintain companies competitive in markets (Pinho et al., 2012). Consequently, it is concluded that ensuring a seamless flow of

knowledge between organisations and their employees is essential to maximise the productivity, and innovation powers of companies but and the same time minimize misunderstandings that could lead to delays (Borowski, 2020; Yang et al., 2021).

1.1 Problem Statement & Existing Gap

According to the literature it is observed that there is a research gap which is related to the onboarding process in the industry (Haave et al., 2023). More specifically, it is mentioned that both KT strategies and hybrid working environments are influencing the onboarding process. In more detail, it is a fact that after the pandemic Covid-19, many companies started to adopt new working regime which promotes new innovative proportions of working hours between office and home (Haave et al., 2023). As a result, this could influence the onboarding process of new employees as there is no possibility for the newcomers to socialize with colleagues and build strong relationships having face-to-face interaction (Haave et al., 2023). Therefore, not only they do not have the opportunity to understand their job roles but also, they do not have the chance to enhance their knowledge through the exchange of thoughts with their colleagues (Knowledge Sharing - KS). To sum up, the research gap that needs to be highlighted is the correlation of the existing typical onboarding process between KT and Hybrid working environments since up until recently there has not been conducted analysis in which it is addressed. However, many scientific articles mention the influence of these two challenges (a) COVID-19 and (b) KT could be moderators for providing any possibility to standardise specific tasks of onboarding new employees in companies.

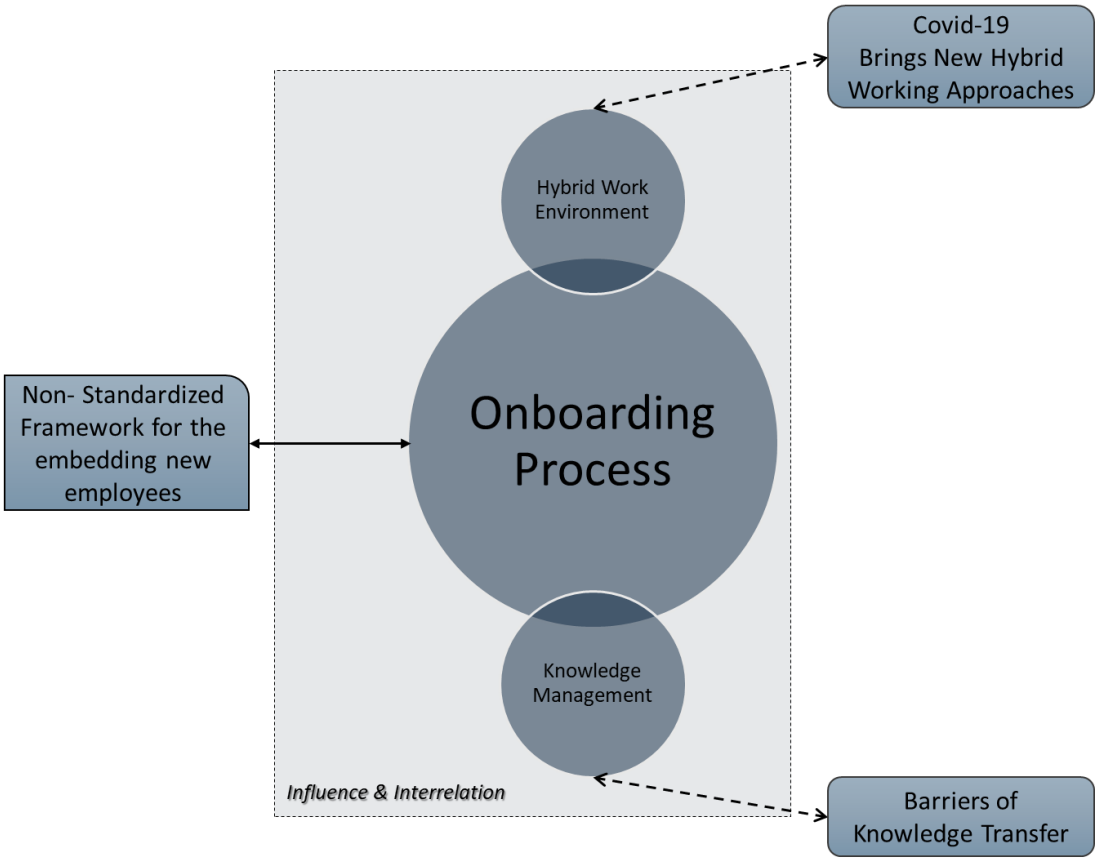

Figure 1: *Influence & Interrelation of KM and Hybrid working approach on the onboarding process*

1.1.1 Conceptual Framework

In this section, a conceptual framework is presented setting the concept of study to provide a clear path of the following research ensuring that the study will remain relevant to the established objective (Imenda, 2014; Van der Waldt, 2020). Furthermore, this conceptual framework helps in clarifying the variables to be studied and the relationships among them, thus enhancing the coherence and understanding of the research (Johnson & Christensen, 2014).

In this research, the role of the conceptual framework is to map out the problem and the process which will be followed by researchers to fill the existing gap leading to the expected outcome. Figure 2 presents the two basic research objectives (KT and onboarding process). Moreover, it illustrates some specific components that have interlinkage with two of these objectives. The aim is to map out the critical objectives and the variety of elements that could influence the relationship between KT and the onboarding process. In this way, it is easier to

understand deeply the problem and to set the concept to structure the research questions and plan what will be the next steps.

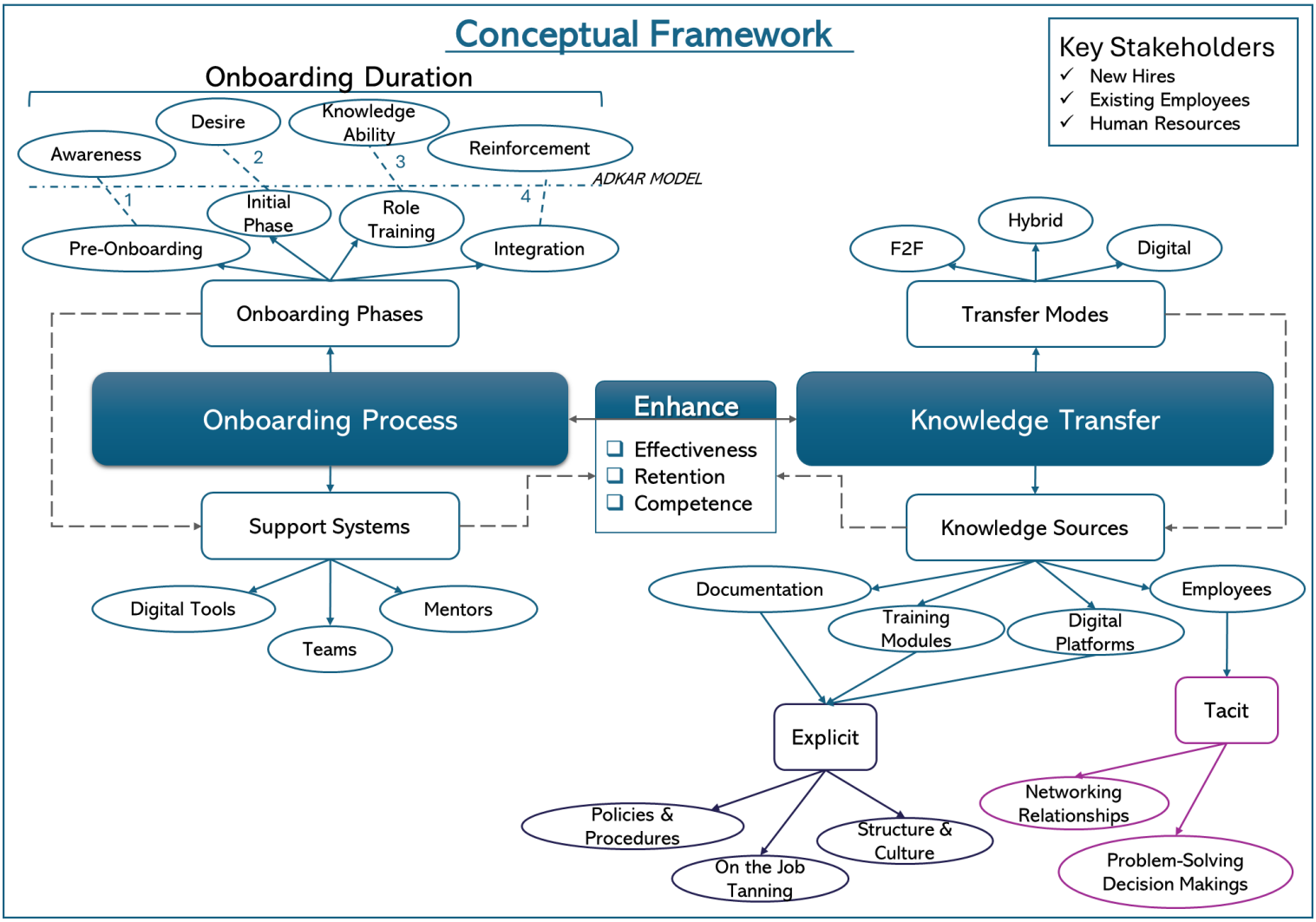

Figure 2: *Conceptual Framework*

The conceptualisation of the research scope is a significant step in the stability and progress of the research because could help to overcome possible vague, ambiguities and challenges that could arise in the future (Johnson & Christensen, 2014; Van der Waldt, 2020).

1.2 Expected Outcome

1.2.1 Research Objective and Questions

According to the above, it would be mistaken to ignore the essence of creating a feasible onboarding process for new employees that could adapt to companies needs to escalate productivity while focusing on KT. Consequently, the purpose of this thesis report is to examine and conduct a comprehensive research analysis of the existing Know KT strategies

and onboarding processes in the industry and how these two could be used effectively in order to improve the embedding process which could help newcomers to maximise their skills reducing waste time and miscommunications due to misunderstanding because of the bad manage of knowledge between employees (Haave et al., 2023).

Subsequently, the thesis report that follows aims to address the primary research question and accompanying sub-questions:

Main Research Question: What interventions should ElvalHalcor implement to address Knowledge Transfer - KT and hybrid work environments challenges enhancing the onboarding process?

S-Q1: What are the Knowledge Transfer – KT barriers which could influence the onboarding process of ElvalHalcor and what are the coping measures to overcome the barriers?

S-Q2: How does the shift to hybrid work environments impact the ElvalHalcor onboarding process?

S-Q3: How could a mentorship program positively influence the Knowledge Transfer - KT supporting hybrid work environments during the onboarding period, analysing the onboarding process of ElvalHalcor company?

To address these challenges and respond to the above research questions either a literature review or interview method might be most appropriate.

Firstly, focusing on the **main research question** is structured according to the other three sub-questions and the main way to reply to this is to respond to the sub-questions.

Regarding **sub-question 1**, the **literature review** will be the main way to analyse and respond to it because this question focuses on identifying specific barriers and solutions that many studies have analysed in the past. However, the **interview** method will be used as a supplement to include this question to compare the findings from the literature with HR professionals, managers and employees' experience with the long-term goal of considering them in the analysis and at the same time validating the data from the literature.

In terms of sub-question 2, it is equally important to use data gathered through **interview methods**. This question benefits from understanding broad trends and existing research on hybrid work environments. To address the challenges related to the unique experiences of employees, gathering feedback through interviews is crucial. This incorporates the perspectives of employees, helping to identify the best practices for onboarding and KT in hybrid settings. Interviews offer valuable insights into real-world experiences and provide a deeper understanding of the specific challenges faced by the workforce.

Finally, the approach for the **sub-question 3** is the **interviews and literature findings**. More specifically, this approach allows for in-depth discussion on how mentorship is integrated into the onboarding process and its effectiveness, which is often subjective and varied across different organizational cultures. This method provides deep insight into personal experiences and qualitative results about the impact of mentorship programs in organizations. The identified issue is that the limited number of participants could cause biased responses.

1.2.2 Research Outcome

The research on how KT affects the onboarding process could greatly improve how companies operate and how satisfied employees are across different industries. By identifying the main challenges to effective, figuring out the best-supported systems of remote work and examining the role of mentorship programs. This study could lead to specific improvements and set new standards for the industry. These findings are expected to help companies speed up their onboarding process, enhance employee satisfaction, and give them an edge over competitors. Additionally, this research could influence policymakers, providing them with data-driven insights to develop guidelines that improve human resource practices industry-wide. Specifically, in the field of construction project management, where rapid team integration is critical, these insights can improve project coordination, ensure compliance with safety standards, and enhance overall project efficiency. This will foster ongoing enhancements that benefit both organizations and their employees, ultimately shaping industry practices for the better.

Consequently, the purpose of this thesis report is to examine and conduct a comprehensive research analysis of the current challenges. By answering these questions, it would be

innovative to offer reliable results for the industry to improve the onboarding process of embedding new employees in companies, using suitable mentorship programs and effectively transferring the knowledge by applying a hybrid approach which will promote a remote working model. Finally, another significant outcome is the assessment of the current onboarding process in the case of ElvalHalcor, which led to the creation of a new onboarding strategy tailored for industrial companies. This strategy includes specific interventions designed to enhance KT and improve the onboarding experience, making it more effective and adaptable to modern challenges, such as hybrid work environments.

1.3 Company Context

ElvalHalcor S.A. stands as a prominent leader in the aluminium and copper industries, formed through the merger of Elval and Halcor. Headquartered in Athens, Greece, and listed on the Athens Stock Exchange, the company is driven by a commitment to innovation and sustainability, employing approximately 2,335 people. It actively pursues advancements in circular economy and climate neutrality, aiming to lead in the production of sustainable aluminium and copper solutions (ElvalHalcor, 2024).

The company's core values of integrity, respect, and innovation shape its operations and strategic goals. ElvalHalcor is dedicated to enhancing customer value through high-quality, competitive, and innovative products, while prioritizing environmental responsibility and social engagement. Looking to the future, ElvalHalcor prioritizes the development of sustainable aluminium and copper products, supporting industries ranging from transportation and construction to renewable energy. This strategic focus not only enhances their market presence globally but also underscores their commitment to responsible growth and the welfare of local communities (ElvalHalcor, 2024).

1.5 Thesis Outline

The structure of this thesis report consists of six main chapters that dive into the keystones of the research process and findings concerning the onboarding process and KT practices within the hybrid work environment. Additionally, the ElvalHalcor case study was investigated and evaluated regarding the current onboarding process and KT practices considering the hybrid working options in the analysis. The structure of the thesis is organised as follows:

- Chapter 1, introduces the research problem, focusing on onboarding and Knowledge Transfer. It also outlines the research objectives, goal and company context.
- Chapter 2 reviews relevant literature, discussing onboarding processes and the ADKAR model. Also, it presents the SECI KT model, KT barriers and coping strategies. Finally, there is a special mention of the integration of mentorship programs, especially in the context of hybrid work.
- Chapter 3 explains the research methodology, detailing the ElvalHalcor case study, data collection, and analysis. Also, it presents a section about the triangulation of the results.
- Chapter 4 presents results and findings after the analysis of collected data using the Atlas.ti software for the qualitative approach.
- Chapter 5 interprets the results addressing the research questions of the thesis study, discussing their theoretical and practical contributions. This chapter concludes the synthesis of the results to provide reliable and comprehensive solutions and findings for enhancing onboarding and KT practices regarding the ElvalHalcor case study, considering also the transition from traditional working environments toward hybrid remote options. Also, they are presented the limitations of the research study and future recommendations for further research.
- Chapter 6 completes the summary of the research highlighting the most important concluding remarks.

2. Literature Review

2.1 Theoretical Framework

Before diving into the literature review and more specifically how the existing literature could apply and connect to the current problem statement in order to fill the existing gap it is essential to present the following definition:

According to Karambelkar & Bhattacharya (2017) who mention that the Society for Human Resource Management define the **Onboarding Process** as the process by which new hires get acclimatized to all aspects of their jobs rapidly and easily, while at the same time they learn the Knowledge, Skills, Abilities and Behaviours which are required to function effectively within an organization.

In addition, it is necessary to define **Knowledge Management [KM]** and **Knowledge Transfer [KT]** and to highlight the difference between these two which are interconnected concepts within the field of organizational studies, focusing on the systematic handling of knowledge within an organization (Argote & Ingram, 2000; Corso et al., 2009; Pinho et al., 2012; Zheng et al., 2010):

Corso et al. (2009) mentioned that **KM** is about "creating an environment that encourages people to learn and share knowledge by aligning goals, integrating bits and pieces of information within and across organisational boundaries, and producing new knowledge that is usable and useful to the organization".

Zheng et al. (2010) argued that **KM** "encompasses the managerial efforts in facilitating activities of acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups".

The conceptual process model for long-term **KT** builds on generic KM activities defined as a process in which employees or employers share their skills, information, experience, or ideas with other departments or other individuals in a business. Generally, **KT** is the ability to formally transfer **tacit and explicit** specialized knowledge held by individuals and/or business units within an organization (Argote & Ingram, 2000; Hellebrandt et al., 2018; EHRC, 2023; Gallemard, 2023).

However, it is equally important to clarify the difference between Explicit Knowledge and Tacit Knowledge.

According to EHRC (2023)*"**Explicit Knowledge** is articulated knowledge, expressed and recorded as words, numbers, codes, mathematical and scientific formulae, and musical notations. Explicit knowledge is easy to communicate, store, and distribute and is the knowledge found in books, on the web, and other visual and oral means and **Tacit Knowledge** is the unwritten, unspoken, and a hidden vast storehouse of knowledge held by practically every normal human being, based on his or her emotions, experiences, insights, intuition, observations, and internalized information."*

2.1.1 Onboarding Process

The Onboarding Process is a complex procedure for each organization who are trying to make new hires feel welcomed into the organization and prepare them for their new tasks to contribute as soon as possible to the company's mission (Abbas et al., 2018; Arnstrand, 2023; Becker & Bish, 2021; Haave et al., 2020, 2023; Karambelkar & Bhattacharya, 2017). According to literature and annual reports of variety of organizations inefficient onboarding process leads to one in three of newcomers leaving the company in the next few months (Abbas et al., 2018). As a result, this causes a negative impact on the organizations in different aspects which are related to productivity, performance, and workforce stability but at the same time this leads to extremely high costs (Abbas et al., 2018). The implications of effective onboarding on employee performance, satisfaction, and retention are profound and multifaceted, reflecting on social aspects of newcomers to jobs quickly, smoothly and knowledge management strategies (Abbas et al., 2018). Hence, effective onboarding processes play a crucial role in the integration of new employees with the organizational culture, goals, and dynamics, which in turn influences their performance, satisfaction levels, and the likelihood of their long-term retention within the organization (Abbas et al., 2018; Arnstrand, 2023; Arsamakov, 2022; Karambelkar & Bhattacharya, 2017; Martyniuk Teaching et al., 2021).

Moreover, many studies have consistently shown a positive correlation between comprehensive onboarding programs and enhanced job performance. More specifically, Karambelkar & Bhattacharya (2017) in their research interconnect the change management

approach and project management to the onboarding process, applying the change management ADKAR model, emphasising the significance of addressing awareness, desire, knowledge, ability, and reinforcement to facilitate a seamless transition for new employees. This approach not only simplifies the adaption process but also, promotes better job satisfaction by equipping employees with suitable tools and understanding of their roles. Apart from that it is easy to understand the significance of job satisfaction of newcomers into any organization in order to acquire a sense of belonging somewhere and start to be productive this is also mentioned in several studies (Haave et al., 2020, 2023; Vold & Haave, 2019) in the research on onboarding during the COVID-19 in which it is highlighted the role of effective onboarding in mitigating uncertainty.

However, it is proven according to studies that the development and integration of Knowledge Management [KM] strategies within onboarding processes play a critical role in the success of the processes. More specifically, Haave et al. (2020) in their research highlighted the critical significance of transferring both explicit and tacit knowledge during the onboarding, which not only accelerates the productive engagement of new employees but also, enhance the deeper connection among employees and the organization. The ADKAR change management framework which discussed by Karambelkar & Bhattacharya (2017) consider the integration of KM strategies within onboarding processes and through this model these strategies could enable the sharing knowledge and best practices, significantly enhancing the onboarding experience and facilitating the integration of new employees into the organizational culture. Therefore, better employee performance, satisfaction, and retention rates may be directly impacted by an efficient onboarding process, especially when combined with strategic knowledge management strategies (Arnstrand, 2023; Becker & Bish, 2021; Martyniuk Teaching et al., 2021).

2.1.1.1 Onboarding Challenges, Phases and Framework

As it has already been mentioned the onboarding process is a crucial and complex task for an organization since it presents numerous challenges for both employees and organizations. Newcomers often face boundaries in acquiring the necessary organizational and specific job knowledge, especially in hybrid working environments (Gregory et al., 2022). Moreover, it was discovered that in hybrid working environments, it is extremely difficult to maintain connections with colleagues and understand internal communication, although structured

planning can enhance the onboarding process (Hannah, 2023). Subsequently, the remote onboarding process gives the chance to organizations to adopt a dynamic approach enhancing their flexibility and gaining access to broaden talent sources. However, this could be a trap and transform into a weakness as increases the difficulty of the acculturation process and internal communications (Hannah, 2023). In parallel, in the literature, it is mentioned the moderator role of mentorship, particularly in structured mentoring programs, could support the transfer of the culture of the organization, enabling newcomers to socialise and become productive members quickly (Dixon et al., 2012). Mentorship programs provide personalized guidance and support which accelerate professional development. The result of this, according to the recent studies that they are mentioned by the literature, shown that an effective onboarding process with structured mentorship programs could improve retention rates by up to 58%. This is very significant for organization which have a special interested in enhancing the retention rates (Dixon et al., 2012). In addition, considering the KT in the onboarding process, it is shown the significance of KT into organizations. An effective KT strategy could ensure that new hires have the necessary understanding of their roles and the company culture to contribute effectively. In more detail, Dixon et al. (2012) mention that a framework that supports KT might include mentorship programs, structured feedback sessions, and regular interactions with colleagues, team leaders and managers. It is proven that these elements help in embedding new employees into the company's fabric, increasing their sense of belonging and being part of the team from day one (Dixon et al., 2012). For instance, the integration of structured mentoring within onboarding processes has demonstrated improvements in performance and retention rates (Dixon et al., 2012).

Organizations should adopt a hybrid onboarding model to provide benefits such as flexibility but also the possibility for with in-person support and integrate agile practices giving weight to adaptability, continuous feedback, and iterative development (Borowski, 2020; Bullock & Sullivan, 2022; Gregory et al., 2022). Additionally, implementing a strong mentoring program will help new hires to take the advantage of the expertise knowledge of the mentor to understand easily and faster not only the organizational culture but also to facilitate smoother adaption(Minnick et al., 2014).

Therefore, according to literature and empirical findings it is proposed onboarding framework which it is consisted of 5 basic steps such as initial orientation, role-specific training,

continuous mentorship, and periodic reviews to assess adaptation and performance of newcomers (Abbas et al., 2018; Alexander, 2023; Arnstrand, 2023; Arsamakov, 2022; Becker & Bish, 2021; Dixon et al., 2012; Gregory et al., 2022; Hannah, 2023; Karambelkar & Bhattacharya, 2017; Leksono & Yulianti, 2022; Martyniuk Teaching et al., 2021). This framework focuses not only on addressing new employees' immediate functional needs but also their long-term career development and satisfaction within the company to avoid creating volatility in retention rates.

1. **Initial Phase → Orientation and Desire:**

   Begin with a comprehensive orientation session that introduces new hires to the company's mission, values, and culture, as well as specific job responsibilities. This should be followed by job-specific training that addresses both the technical and soft skills required for the role (Hannah, 2023).

2. **Add Mentor → Structured Mentoring:**

   The second step consists of the implementation of a structured mentoring program that pairs new hires with experienced mentors. This approach facilitates quicker cultural absorption and provides ongoing support for feeling welcome and skills development (Dixon et al., 2012).

3. **Role Training → On-Job and Continuous Learning:**

   The third significant step focuses on the specific job-training. Also, in this step it is equally important to invest on the continuous learning of newcomer. Giving this possibility allows new hires to upgrade their skills and adapt to new technologies and methods within the company. This could include workshops, online courses, and participation in industry conferences (Gregory et al., 2022).

4. **Feedback Loop → Performance Monitoring and Checklist:**

   Regularly review the performance of new hires through formal assessments and informal feedback sessions. This helps in identifying any gaps in skills or knowledge and provides a basis for continuous improvement (Hannah, 2023).

5. **Integration → Reinforcement and Recognition:**

Reinforce positive behaviours and achievements with formal recognition programs and informal praise. This not only boosts morale but also encourages new hires to align closely with the company's goals and values (Gregory et al., 2022).

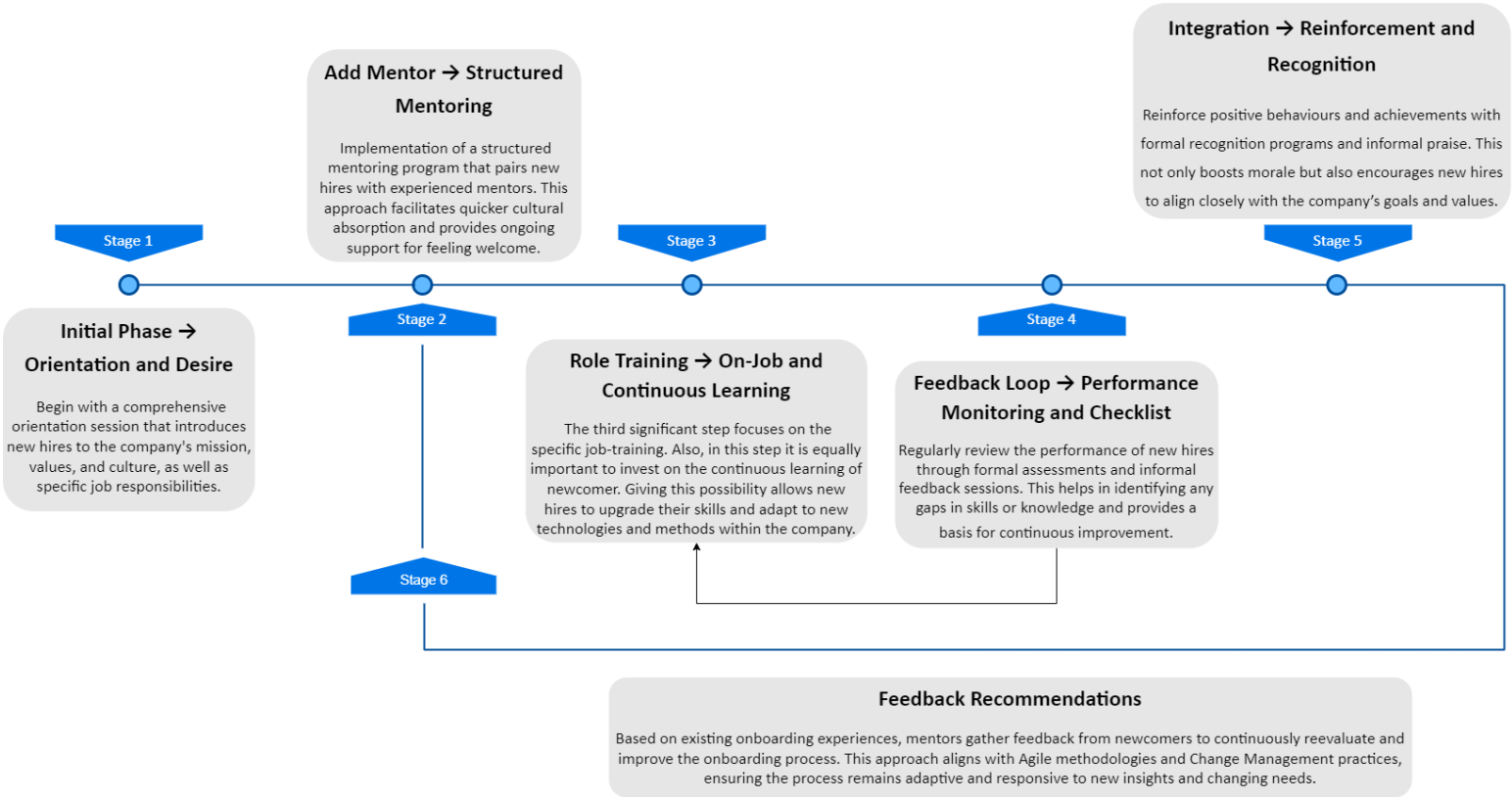

Figure 3: *Illustration of the typical steps of onboarding in the industry.*

2.1.2 Knowledge Transfer [KT]

The transfer of knowledge, as argued by Argote & Ingram (2000), is foundational for competitive advantage, necessitating a systematic approach to onboarding that leverages Knowledge Management - KM to optimize new employee integration. At the same time, it is proven that The Knowledge-Based Theory suggests that knowledge is the most strategic resource of a firm, critical for gaining a competitive edge in the modern business landscape. Also, this theory recommends that the effective management of knowledge within an organisation can significantly enhance its ability to innovate, respond to environmental changes promote adaptivity, and sustain a competitive advantage over time (Argote & Ingram, 2000; Zheng et al., 2010). Argote & Ingram (2000) highlight the variable effectiveness of KT across organisations, pointing to the strategic significance of developing robust KM strategies that support organisational learning and adaptability. As a result, knowledge

constitutes an asset for any company that they are trying on a daily basis to maintain and enhance it consequently, it is a matter of great importance that they do not lose this asset during the integration of new employees (Pinho et al., 2012).

According to the above and in the context of enhancing onboarding processes, KT strategies serve as blueprints for the systematic capture, distribution, and effective utilization of organizational knowledge (Zheng et al., 2010). Therefore, until recently, one fundamental framework which presents an extremely high interconnection to this sector is Nonaka and Takeuchi's SECI Model, which points out the dynamic process of knowledge transformation from tacit to explicit and vice versa across four modes: Socialization, Externalization, Combination, and Internalization (Hoe, 2006). This model underscores the beneficial role of knowledge in fostering innovation and enhancing organizational capabilities, constituting a knowledge transferring strategy with the onboarding process (Hoe, 2006). More specifically, the socialization phase can facilitate new hires' adaption and interconnection into the company's values and tacit knowledge sources through interactions with colleagues and mentors (Haave et al., 2020; Hoe, 2006; Yao et al., 2023). Consequently, the SECI model mentions the significance of informal knowledge processes, especially socialization and internalization, in developing a learning organization, as Hoe (2006) explains. As a result, by implementing the SECI model, businesses can create onboarding initiatives that infuse new hires with the company's strategic insights and cultural values (Hoe, 2006; Zheng et al., 2010). This creates a strong basis for long-term competitive advantage and organizational agility (Argote & Ingram, 2000).

2.1.2.1 SECI Model

In this section will become a special detailed mention about SECI model in into the onboarding process. As it has already mention SECI model developed by Nonaka and Takeuchi in 1995. The integration of the SECI model into the onboarding process could active the effectiveness of KT, ensuring the adoption of both explicit and tacit knowledge for the role of newcomers (Hoe, 2006). This model consists of four interrelated phases Socialization, Externalization, Combination, and Internalization. as it presented following in the Figure 4 (Hoe, 2006):

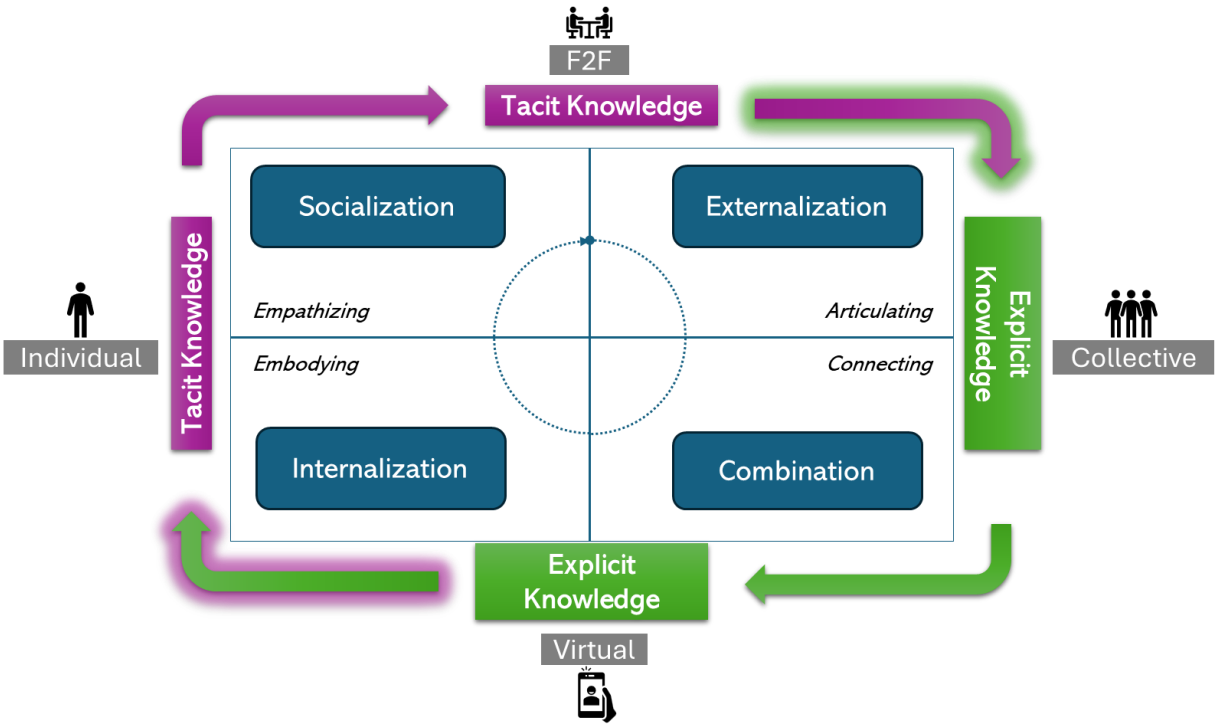

Figure 4: Illustration of SECI model

- **Socialization** ***[Tacit to Tacit]:*** This involves sharing experiences and tacit knowledge through direct interaction. For new employees, this stage is crucial as it involves absorbing the unwritten, often cultural and experiential, knowledge through interactions with colleagues and mentors. This direct engagement helps to dive into a foundational and inherent understanding of the organizational values and workplace dynamics.
- **Externalization** ***[Tacit to Explicit]:*** Regarding this stage, it happens the articulation of tacit into explicit knowledge, which can be crucial during onboarding. More specifically, newcomer have the opportunity through open-dialogues and reflections to share their understanding or questions about their roles in more structured forms, such as written documents or presentations. This process not only helps them clarify their own understanding but also, contributes to the collective expertise knowledge into organization, making tacit insights accessible to others. This collective knowledge is typically stored in both formal systems, like databases and documentation, and informally through the culture and social interactions among employees. By effectively managing this knowledge, organizations can improve efficiency, enhance decision-making, and maintain a competitive edge.

- **Combination** ***[Explicit to Explicit]:*** An effective onboarding involves synthesizing various explicit knowledge pieces from training modules, manuals, and other documentation. This helps new hires integrate information across different domains, forming a comprehensive understanding of their role and its interconnections within the organization. This stage is vital for helping new employees see beyond their immediate roles and appreciate the broader organizational objectives and functions.
- **Internalization** ***[Explicit to Tacit]:*** *In this stage it is* completed the cycle by translating learned explicit knowledge into tacit knowledge through practical application. As new hires start to engage in their day-to-day tasks, the previously formal knowledge becomes a personal skill set that they adapt and refine through hands-on experiences.

Consequently, the SECI model not only streamlines the flow of knowledge but also, this ensures that knowledge is retained and utilized effectively (Hoe, 2006). For instance, a study highlighted in Nonaka & Takeuchi (1995) shows how a technology firm in Japan implemented the SECI model to enhance their engineers' onboarding experience, leading to a 50% reduction in the time required for new engineers to reach full productivity and a 30% increase in productivity within the first year (Nonaka & Takeuchi, 1995).

Finally, integrating the SECI model into onboarding has been shown to significantly reduce employee turnover (Hoe, 2006). According to a case study of a Norwegian healthcare provider, it is shown that using systematic KT approaches, particularly in the socialization and externalization phases, led to a 25% decrease in new hire turnover rates during the first 18 months (Haave et al., 2020). This improvement was mostly related to new hires becoming more easily integrated into the firm and quickly adapted to their roles (Hoe, 2006).

2.1.2.2 Knowledge Transfer Modes during Onboarding

As it is mentioned in various literatures there are three specifics modes of KT, for both transferring tacit and explicit knowledge, namely, **Face to Face [F2F], Hybrid and Online** (Haave et al., 2020; Hoe, 2006; Zhou et al., 2023).

Regarding the **F2F** mode, the interactions are critical for transferring tacit knowledge which includes valuable knowledge based on the experience of employees. As a result, it is essential to give the possibility of close and daily communication in order to transfer skills, behaviours and cultural norms. This way of communication could be achieved through mentoring, and on-the-job training, allowing newcomers to observe and practice in real time. It is observed

that the elimination of F2F could increase the negative impact in tacit KT compared to explicit KT. Since it is more difficult to communicate this kind of thing without daily interaction there is a possibility for direct interaction allowing for immediate feedback and clarification. On the other hand, newcomers could acquire explicit knowledge through F2F communication following structured training sessions and workshops (Haave et al., 2020, 2023; Zhou et al., 2023).

The second mode of KT could be **Hybrid**, the combination of F2F and online interaction. Hybrid approaches combine virtual and face-to-face contacts to enable the transfer of tacit knowledge through irregular in-person encounters and virtual meetings. This approach works well for companies with a distributed staff or flexible work policies. The hybrid model integrates live, interactive sessions where employees can communicate and discuss content with trainers and coworkers to acquire explicit knowledge, while also using online platforms for the sharing of formal documents, policies, and e-learning modules (Hannah, 2023; Pinho et al., 2012).

Also, the third way of transferring knowledge is completely **Online**. In this mode, online methods can transfer tacit knowledge through video, and virtual reality setups that simulate a variety of real-life scenarios (Corso et al., 2009; Hannah, 2023). Online methods can transfer tacit knowledge through video demonstrations, interactive simulations, and virtual reality setups that mimic real-life scenarios. Online onboarding is mostly used to share explicit knowledge effectively across the globe using structured e-learning courses, extensive digital libraries, and webinars that employees may access remotely. However, due to COVID-19 changes many companies in the industry are trying to use online onboarding methods to be more attractive and take advantage to attend new high-level talents (Arsamakov, 2022; Scott et al., 2022). So, it is observed that the industry is inclined to be more adaptive modifying a strategy based on change management transitioning from traditional approaches (Bullock & Sullivan, 2022; Hannah, 2023; Hoe, 2006; Petrilli et al., 2022; Scott et al., 2022).

2.1.2.3 Types of Knowledge Transferred in Onboarding

Additionally, as has been already described above, the onboarding process can be divided into four phases, each focusing on specific types of knowledge for supporting a comprehensive and well-rounded integration of new hires (Gorman, 2002; Hutchinson, 2024; Star & Stylianides, 2013):

- **Declarative / Propositional Knowledge**: This is knowledge of facts and information, such as understanding the organization's mission and values. It is focused more on "What".
- **Procedural Knowledge**: This is knowledge of how to perform tasks or processes, like knowing the steps to complete a project report or how to use specific software.
- **Compliance Knowledge**: This involves understanding and adhering to rules, regulations, and standards, such as safety protocols in construction or legal requirements in data handling.

More specifically, the pre-onboarding phase introduces propositional knowledge about the company's mission, values, and structure, helping new hires build a foundational understanding of the organization. Additionally, procedural knowledge related to administrative tasks, such as filling out forms and accessing internal systems, familiarizes employees with initial processes. Conducting this phase online before the start date ensures that employees arrive with a clear sense of company values and practical readiness.

In the initial orientation phase, procedural knowledge is further emphasized, as new hires are trained on role-specific tasks and standard operating procedures. This hands-on training ensures that employees understand how to perform essential job duties. The phase also introduces compliance knowledge, essential in industries like construction and project management, where adherence to safety protocols and regulatory standards is critical. Both procedural and compliance knowledge establish the foundational skills and understanding necessary for employees to operate confidently and safely within their roles.

In the last phases, role training and integration & continuous learning, shift the focus toward explicit and tacit knowledge. In the role training phase, explicit knowledge (technical manuals, training guides) provides structured support for technical skill acquisition, while tacit knowledge is developed through experiential learning, mentorship, and real-world practice, enabling adaptability to complex tasks. During the integration phase, employees gain contextual knowledge to understand how their tasks align with broader organizational goals, and strategic knowledge to contribute proactively to long-term objectives. This phased approach ensures that employees transition smoothly from foundational learning to practical

application, strategic alignment, and continuous growth, preparing them to contribute effectively to both daily operations and organizational success.

2.1.2.4 Barrier of Knowledge Transfer [KT] during Onboarding

According to the above there is no doubt that understanding the role of KT within the onboarding process is fundamental for enhancing the efficiency and integration of new hires (Zhou et al., 2023). Since, KT facilitates a smoother adaption into the organization, reducing the onboarding time and equipping newcomers with the necessary skills and knowledge to perform effectively. Effective KT ensures that both tacit and explicit knowledge is communicated, helping new employees understand organizational processes and culture, which in turn reduces turnover and training costs (Haave, Vold, & Kaloudis, 2020). However, there are several barriers that could influence the KT during the onboarding process, and this creates internal volatility in organizations.

Therefore, it is a priority to identify and then understand these barriers before finding ways to mitigate their impact on newcomer's adaption. The most common barriers impacting the effective KT, as identified in the literature, are frequently compounded by a series of interconnections. Firstly, zero guidance can lead to ambiguities and a lack of role clarity, making it unclear for employee's what knowledge needs to be shared and how (Haave et al., 2023; Zhou et al., 2023). This uncertainty, combined with inadequate onboarding structures, can exacerbate information overload, leaving employees overwhelmed and unsure of where to focus (Haave et al., 2020; Zhou et al., 2023).

Additionally, cultural barriers and social isolation can prevent the formation of effective communication channels, further complicating the knowledge-sharing process (Dixon et al., 2012; Haave et al., 2023; Zheng et al., 2010; Zhou et al., 2023). Moreover, withholding information due to hiding behaviour is another essential barrier which depends on the working environment and on the competitiveness among employees (Weng et al., 2020; Yao et al., 2023; Zhou et al., 2023). Finally, the resistance to change also significantly obstructs the flow and adoption of essential knowledge within the organization (Leksono & Yulianti, 2022).

In Figure 5, it is presented the list of KT barriers during the onboarding process.

Uncertainty and Lack of Role Clarity	• Newcomers often face ambiguity regarding their roles, which can hinder their ability to integrate knowledge effectively.
Inadequate Onboarding Structure	• Poorly designed onboarding programs that lack clear objectives and structured learning paths can fail to facilitate effective knowledge transfer.
Information Overload	• Bombarding new hires with too much information too quickly can overwhelm them, leading to poor retention of important details.
Social Isolation	• Especially in remote settings, the lack of informal interactions can prevent the sharing of tacit knowledge.
Cultural Barriers	• Differences in cultural background can lead to misunderstandings and ineffective communication, complicating the KT process.
Witholding Information due to Hiding Behaviors	• Existing employees might withhold critical information to safeguard their status or out of mistrust, disrupting knowledge sharing.
Resistance to Change	• Newcomers may resist new organizational methods and practices, especially if they feel disconnected from the organization's values or the onboarding process.

Figure 5: *List of KT barriers during the Onboarding of new hires.*

Consequently, it is required to overcome these barriers following strategic interventions to deal with specific challenges with the long term to increase the effectiveness of KT and enhance the onboarding process into organizations (Haave et al., 2020).

In Figure 6 it is presented the list of interventions to address the barriers of KT.

Figure 6: *List of interventions to deal with barriers of KT during the Onboarding of new hires.*

Addressing the barriers to effective KT through targeted strategies not only enhances the onboarding experience but also boosts overall organizational efficiency and employee satisfaction. By strategically implementing structured onboarding programs, fostering mentorship, and ensuring cultural integration, organizations can significantly improve the outcomes of their KT efforts. Finally, Brødsjø et al. (2023) mentions Siakas & Georgiadou (2006) model which can used as a strategy for sharing knowledge and this encourages the KT, with specific steps. This procedure is presented in the following Figure 7. This valuable strategy creates an environment which promotes open communication and effective KT which leads to aligning new employees with a company's goals and culture. This can significantly enhance operational efficiency and decrease employee turnover.

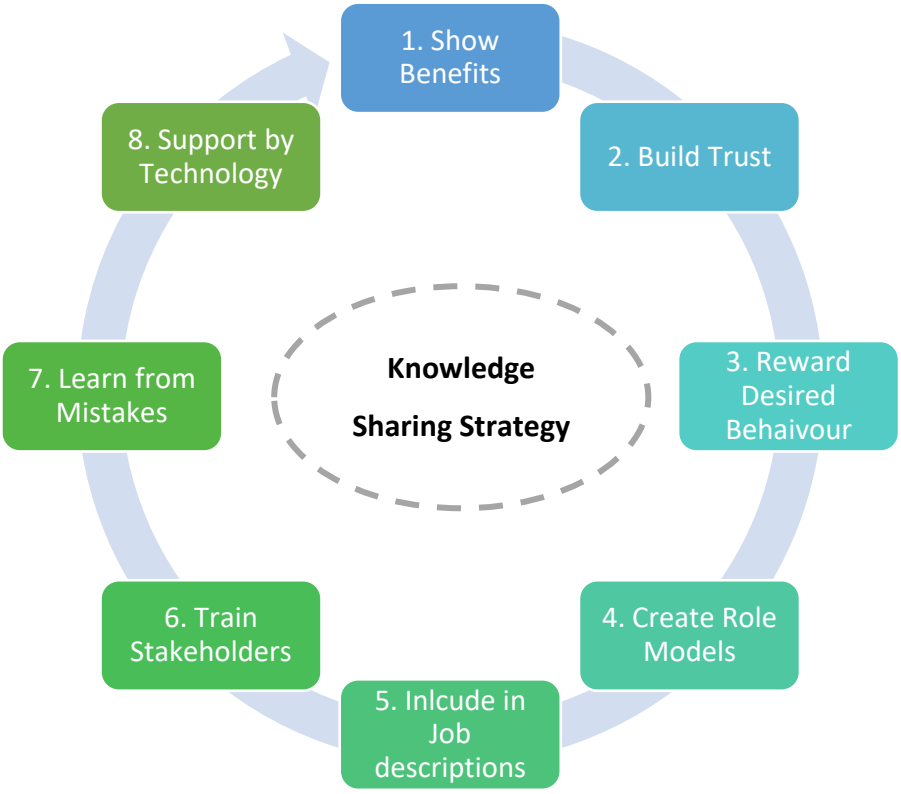

***Figure 7**: Knowledge Sharing Strategy step by step based on Siakas & Georgiadou (2006)*

2.1.3 ADKAR Model

The ADKAR model, developed by Prosci, is a powerful framework designed to guide organizational change management by focusing on five critical elements namely Awareness, Desire, Knowledge, Ability, and Reinforcement (Hiatt, 2006; Karambelkar & Bhattacharya, 2017). Applying the ADKAR model to the onboarding process can significantly enhance KT and facilitate the smooth integration of new employees into an organization, ensuring that employees are prepared, motivated, and capable of embracing new initiatives (HiPeople, 2024; Karambelkar & Bhattacharya, 2017; Leksono & Yulianti, 2022).

To effectively implement the ADKAR model in the onboarding process, organizations should focus on each of the following stages (Jaaron et al., 2022; Karambelkar & Bhattacharya, 2017; Leksono & Yulianti, 2022):

1. **Awareness**: This stage emphasizes making individuals aware of the necessity of change. This involves clear communication about why the change is necessary and the benefits it will bring to the organization. For onboarding, this means helping new hires

understand the organizational culture, their role expectations, and the specifics of their job functions.

2. **Desire:** This stage fosters a personal motivation among new employees to engage with and support the organizational culture and their new roles, highlighting both personal and professional benefits. In onboarding, this translates to inspiring new employees to integrate fully into their roles and the organization, highlighting personal and professional benefits they can gain.
3. **Knowledge:** Providing knowledge on how to adapt to the new role and organization, this stage covers training and education about tasks, tools, and processes necessary for success in the organization.
4. **Ability:** This stage translates the knowledge provided into action. It includes practical training and mentoring, equipping new employees with the necessary resources and skills to perform their roles effectively. This step is crucial for applying what they have learned in real-world scenarios.
5. **Reinforcement:** The final stage ensures that the new behaviours and skills are sustained through feedback, recognition, and rewards, thereby embedding new skills and enhancing job satisfaction and retention. For onboarding, it ensures that new hires continue to feel supported and valued, which increases retention and job satisfaction.

The ADKAR model presents an extremely high interconnection with Project Management activities. and highlights the significance of a custom-designed onboarding process since this can benefit new employees to be engaged easily, resulting in higher productivity (Karambelkar & Bhattacharya, 2017). In the following Table 1, it is presented the correlation of the stage of the ADKAR model with Project Management activities and the key activities for the implementation of the model.

Table 1: *Phases of ADKAR model and project management with each key activity (Karambelkar & Bhattacharya, 2017).*

ADKAR phases	Change Management	Project Phases	Project Management	Key Activities
1	Awareness	*1*	Requirements	*Communication*
2	Desire	*2*	Design	*Coaching/Resistance Management*
3	Knowledge	*3*	Implementation	*Coaching, Mentoring and Training*
4	Ability			
5	Reinforcement	*4*	Post-implementation	*Mentoring*

Applying the ADKAR model's stages to the onboarding process can be beneficial in several aspects (Karambelkar & Bhattacharya, 2017). The ADKAR model is in perfect alignment with the stages of onboarding because it focuses on increasing awareness of the company culture and job responsibilities, encouraging a desire for both personal and professional growth, building knowledge through thorough training, developing abilities via mentorship, and reinforcing positive behaviours (Hiatt, 2006; Jaaron et al., 2022). As a result, newcomers can immediately understand the company's values, goals, and expectations through this organized method which provides enhanced employee integration by promoting smoother transitions and faster adaption. In addition, addressing professional development ambitions and transmitting necessary knowledge and skills improves engagement, which boosts the motivation and dedication of newcomers (Karambelkar & Bhattacharya, 2017). Also, until recently, the implementation of the ADKAR model in onboarding processes has been empirically shown to generate significant improvements and several clear benefits in employee onboarding and generally to organizational performance. More specifically, according to Leksono & Yulianti (2022), a study found that applying the ADKAR model not only could lead to an improvement in overall training effectiveness by 25% but also, this could benefit the participant's satisfaction rates presenting a rise of 30%. Also, Shepherd et al. (2014) mentioned that integrating the ADKAR model into the onboarding process at a healthcare institution reduced the time for newcomers to reach full productivity by 50%. In addition, there was a 20% decrease in turnover during the first year of employment, highlighting the role of the Reinforcement stage in sustaining long-term employee engagement and retention. Finally, the application of the ADKAR model in the construction industry showed a 40% increase in the speed of BIM adoption among engineers and project managers after systematic training and reinforcement were implemented (Jaaron et al., 2022). This indicates that clear awareness and desire stages can significantly accelerate the uptake of new technologies.

In parallel, it is a fact that through several real case studies and practical applications, the ADKAR model has proven to be a valuable tool for navigating change, fostering a culture of continuous improvement and in general for use in the onboarding process since various multinational companies have implemented this model (Hiatt, 2006; HiPeople, 2024; IvyPanda, 2019; Jaaron et al., 2022; Leksono & Yulianti, 2022; Shepherd et al., 2014; Stein &

Christiansen, 2010). Cisco Systems, for instance, used the ADKAR model to address the challenges of rapid expansion and technological advancement. Cisco maintained that new personnel were educated by emphasizing increasing awareness through pre-boarding programs, stimulating desire with a mentorship program, and acquiring knowledge through e-learning and in-person training (Hiatt, 2006). Practical hands-on training and regular feedback sessions enhanced their ability, while a feedback loop and recognition programs reinforced the changes. As a result, Cisco experienced higher new hire satisfaction, quicker productivity ramp-up, and improved retention rates (Hiatt, 2006; HiPeople, 2024; Stein & Christiansen, 2010). Similarly, Procter & Gamble (P&G) utilized the ADKAR model to support its global workforce, ensuring new hires aligned with the company's values and strategic goals (IvyPanda, 2019). P&G's comprehensive onboarding portal provided essential information, while onboarding workshops and social events increased engagement and desire among new employees. Structured training programs and practical project assignments enhanced their knowledge and ability, supported by mentoring from experienced colleagues (IvyPanda, 2019). Continuous feedback and recognition programs reinforced the onboarding process, leading to seamless integration, improved performance, and increased employee engagement (Hiatt, 2006; IvyPanda, 2019).

Summarizing all the above, it is concluded that the ADKAR model significantly enhances onboarding processes in organizations by effectively structuring the integration of newcomers (Hiatt, 2006; Karambelkar & Bhattacharya, 2017). This model ensures that new employees are well-prepared and supported as they transition into their roles, leading to smoother adaptation, increased engagement, and higher productivity (HiPeople, 2024). This not only speeds up the time it takes for newcomers to become productive but also trigger the overall employee engagement and organizational productivity. The empirical evidence strongly supports the ADKAR model as a vital strategy for modern human resource management, crucial for fostering a positive onboarding experience and long-term employee retention (Hiatt, 2006; HiPeople, 2024; Shepherd et al., 2014; Stein & Christiansen, 2010).

2.1.4 Synergizing Models for Integrating KT in Onboarding Process

The synergy between Nonaka and Takeuchi's SECI model and the ADKAR change management model provides a robust framework for onboarding (Hoe, 2006; Karambelkar & Bhattacharya,

2017). In more detail, the SECI model emphasises the cyclic transformation between tacit and explicit knowledge offering a dynamic approach to KT that is essential during the onboarding phase. In parallel, the SECI model provides the notion that knowledge is a strategic asset, making the effective management and diffusion of this knowledge through onboarding processes critical for sustaining competitive advantage in the market. Considering all the above, the ADKAR model complements these theories by providing a structured approach to managing the human aspect of change during onboarding, emphasizing the sequential steps of Awareness, Desire, Knowledge, Ability, and Reinforcement (Karambelkar & Bhattacharya, 2017).

To sum up, the integration and combination of Nonaka and Takeuchi's SECI model and the ADKAR change management model into the onboarding process not only enhances the effectiveness of KT but also, play a vital role in the positive impact on organization's success and an employee's embedding and productivity making systemic and proactive onboarding (Becker & Bish, 2021; Brødsjø et al., 2023; Davenport et al., 1998; Karambelkar & Bhattacharya, 2017; Pinho et al., 2012; Yao et al., 2023). As a result, it is a fact that this holistic approach could ensure that newcomers are fully equipped to contribute to their new organization's objectives, aligned with values and goals, and sustain its competitive advantage (Karambelkar & Bhattacharya, 2017). This holistic approach highlights the strong interconnectivity and interoperability between these models and the strategic onboarding process (Karambelkar & Bhattacharya, 2017).

2.1.3.1 Remotely Working Environment

This research will be considered for analysis another significant aspect which is related to the remote working environment and how this affects the onboarding process, especially after the pandemic. The worldwide pandemic hastened the move towards remote and hybrid working models, compelling a thorough rethink of conventional employee induction methods. This change underscores the importance of adopting digital tools in management strategies, helping businesses to adapt to changing conditions, manage performance efficiently, and bolster their overall capabilities (Arsamakov, 2022; Liu et al., 2024; Petrilli et al., 2022; Scott et al., 2022). This situation leads to a transition from traditional processes to more adaptive management processes, requiring from AEC industry and general the

organizations to create more innovative approaches to integrate newcomers effectively, ensuring that they could embed the new members of the team despite the lack of physical presence and mentorship (Arsamakov, 2022; Karambelkar & Bhattacharya, 2017; Liu et al., 2024). Also, it is significant to find out the most optimal practices to address remote work's unique challenges for effective transferring of Knowledge (Corso et al., 2009; Yang et al., 2021) . Therefore, there is no doubt that this creates an impact not only on the organizations and procedures but also, generally on the industry. Remote work environments demand organizations to gain more digital tools and software in order to convey organizational culture, expectations, and knowledge (Arsamakov, 2022; Yang et al., 2021).

Regarding the onboarding part, Petrilli et al. (2022) mention that digital onboarding needs the necessary tools in order to ensure the smooth embedding and socialization of new employees. This research focuses on activities such as compliance, clarification, culture, and connection as essential components of digital onboarding, aiming to foster a sense of belonging and alignment with organizational values from afar (Petrilli et al., 2022). Furthermore, the reliance on digital communication platforms introduces challenges in building relationships and teamwork, as highlighted by the research on Microsoft's workforce, indicating that the depth of interactions can be compromised in a virtual setting (Yang et al., 2021).

On the other hand, it is equally important for organizations to find the most optimal way to ensure the flow of knowledge in remote onboarding (Arsamakov, 2022; Corso et al., 2009; Yang et al., 2021). Hence, the integration of KT into the remote onboarding process is critical for ensuring that new hires gain the necessary knowledge and skills to succeed in their new roles. However, the main advantage of Hoe's research for the SECI model is that the knowledge conversion can be applied in the case of remote work, with emphasis not on the shared context in the physical sense but on the continuous transformation of tacit and explicit knowledge enabled through digital means (Yang et al., 2021). For instance, socialization may take place with the help of virtual meetups while internalization is being supported with online training sessions and simulations. The role of technology in the process could be proven catalytic by providing tools such as collaborative software, and virtual reality equipment with the long-term goal to enhance the way of knowledge sharing within onboarding (Arsamakov, 2022; Corso et al., 2009; Petrilli et al., 2022; Yang et al., 2021).

In conclusion, the transition to hybrid work environments demands a strategic approach to onboarding that incorporates digital tools and KT practices to overcome the inherent challenges of remote work reconfiguring traditional practices. To adapt to this new circumstance, three major factors for new employee success are arised by Scott et al. (2022) analysis: (1) building knowledge and confidence, (2) creating social connection, and (3) supporting employee well-being. This comprehensive approach not only enriches the onboarding experience but also contributes to the overall resilience and adaptability of the organization in the face of future disruptions otherwise this could affect the performance and connection of employees with the long-term possibility of leaving the organization (Arsamakov, 2022; Scott et al., 2022).

2.1.3.2 Mentorship Programs

Regarding the mentorship programs, it is a fact that they could play a crucial role in both Knowledge transferring process and onboarding processes (Minnick et al., 2014). They could be used as a strategy for creating environments for open dialogue and building trustworthy relationships between personnel through the right guidance which will help to overcome behaviour such as hiding (Weng et al., 2020; Yao et al., 2023). Additionally, it is proven that mentorship programs in onboarding not only have a positive effect on the practical aspects of role adjustment but also, significantly enhance the emotional and cultural integration of new hires into organizations by supporting and helping them gain organizational cultural competence (Dixon et al., 2012).

However, as it has already been mentioned above there are three modes of KT which present an interconnection with mentorship programs (Ahmed, 2021; Alexander, 2023; Arnstrand, 2023; Minnick et al., 2014; Petrilli et al., 2022):

- Face to Face Mentorship
- Hybrid Mentorship
- Online Mentorship

Traditional face-to-face mentorship offers the most direct and personal form of interaction, but hybrid and online mentorships have distinct advantages.

Hybrid mentorship combines in-person and digital interactions, providing flexibility while maintaining a personal connection crucial for cultural and social integration. This is an

attractive advantage both for companies and newcomers. On the other hand, online mentorship is especially valuable for organizations with a geographically dispersed workforce, ensuring consistent support and guidance for all new hires, regardless of their location. In both options, the use of digital tools is demanded.

Investigating the literature in more detail, they identified several advantages regarding the beneficial aspect of mentorship programs in onboarding. The most significant was that a well-structured mentorship program could **accelerate learning and productivity**, **enhance the KT and Cultural Integration** and **improve retention rates** (Ahmed, 2021; Alexander, 2023; Baan, 2024; Dixon et al., 2012; Minnick et al., 2014; Zaharee et al., 2018). More specifically, regarding accelerated learning and productivity, mentorship programs can reduce the time it takes for new hires to adapt and become productive. For example, a structured mentoring program integrated into an automobile manufacturing company's onboarding process led to faster ramp-up times for new engineers, reducing the time to full productivity by about 50% within the initial 18 months (Dixon et al., 2012).

Moreover, in terms of enhanced KT and Cultural Integration, mentors help new hires understand the unspoken norms and values of the organization, facilitating smoother cultural assimilation and more effective KT. This is especially vital in hybrid and online settings where in-person communication and informal learning opportunities are limited. This is something that creates a special interested in the industry as after the pandemic the shift towards hybrid and fully online onboardings has determined making the mentorship programs a viable tool to mitigate the potential risks of this shift.

Finally, focusing on improved Retention Rates, organizations that implement mentorship programs see lower turnover rates among new hires since the presence of a mentor provides a support system for new employees, which is crucial for maintaining engagement, satisfaction (Dixon et al., 2012).

Karambelkar & Bhattacharya (2017) analysing the ADKAR model highlighted the role of mentorship in this model. More specifically, they emphasize the significance of guiding properly the newcomers through the change inherent in joining a new organization. In this model, there are four pillars of application for onboarding (awareness, desire, knowledge, ability, and reinforcement) which align with creating a supportive environment for transferring tacit knowledge through direct interactions and guidance from more experienced

employees (Karambelkar & Bhattacharya, 2017). This structured approach to mentorship improves a newcomer's onboarding experience, making the adaptation phase a less difficult task and more efficient (Minnick et al., 2014).

In parallel, it seems that two barriers to KT which hurt the general Knowledge Management of an organization, leading to an unsuccessful onboarding process for newcomers, are Shadowing and Storytelling (Abbas et al., 2018; Arnstrand, 2023; Arsamakov, 2022; Haave et al., 2023; Karambelkar & Bhattacharya, 2017; Petrilli et al., 2022). Except from the typical situation the domination of pandemic on the planet brought to surface new unique challenges for onboarding (Arsamakov, 2022; Petrilli et al., 2022; Scott et al., 2022). This highlights the need to find and create new innovative and more adaptive approaches in order to maintain the effective KT in remote environments (Haave et al., 2023; Petrilli et al., 2022). Also, the SECI model from Nonaka and Takeuchi sets a theoretical framework that puts into sharp focus the criticality of building environments for the support of people in sharing knowledge (Hoe, 2006). Translated into the onboarding context, this means that mentorship programs should be designed in a way that new employees are encouraged to take part in such social interactions, sharing their experiences and thereby having the chance to internalize the explicit knowledge that they are given and helps to clarify the expectations of new employee (Minnick et al., 2014). This way, smoother organizational integration occurs (Haave et al., 2020). These models and strategies collectively suggest that a well-structured mentorship program supported by an understanding of the SECI model, and the principles outlined in the ADKAR model, can lead to a more effective onboarding experience for new employees (Hoe, 2006; Karambelkar & Bhattacharya, 2017). A well-structured program not only reduces the time required for new employees to become fully productive but also, increases their engagement, and commitment to the organization and add extra value both to organizations and new hires (Minnick et al., 2014).

To summarise, mentorship programs are essential for effective onboarding, particularly in hybrid and online settings where direct communication may be limited (Minnick et al., 2014). They are vital for transferring mainly tacit knowledge, fostering cultural integration, and building professional networks (Alexander, 2023; Dixon et al., 2012). As organizations adapt to post-pandemic realities, strategically implementing mentorship within onboarding

processes is key to driving employee success and enhancing organizational resilience (Bullock & Sullivan, 2022; Minnick et al., 2014; Petrilli et al., 2022).

2.2 Summary

In this chapter, they have explored various models and KT modes in onboarding processes. Summarizing all the above theories of the literature regarding the main onboarding phases, the ADKAR model and the KT, they are presented in the following Table 2 to make a comprehensive overview of the literature research making it more accountable and understandable the following gap which caused by non-structured hybrid onboarding processes of the industry. This makes the onboarding experience for newcomers problematic leading to additional time and cost for companies.

Table 2: *Correlation between onboarding phases, ADKAR models within transfer modes and mitigation tools of KT to overcome the most significant barriers in each phase.*

Onboarding Phase	ADKAR phases	Function in Onboarding	Barrier of KT	Transfer Mode of KT	Mitigation
Pre-boarding	Awareness	Introduces company culture & expectations	Lack of clear communication	Online	Interactive onboarding portal
Initial Phase	Desire	Builds connection & Motivation	Resistance to change & Withholding Information	Hybrid	Mentorship program
Role-Specific Training	Knowledge / Ability	Provides necessary skills & job knowledge	Inadequate training resources	F2F & Online	E-learning platform & workshops
Integration	Reinforcement	Ensures skills & behaviours are sustained	Lack of feedback	Hybrid	Regular check-ins & feedback sessions

By integrating these KT methods within the ADKAR framework during the onboarding process, organizations can ensure a smooth transition for new hires, from gaining initial awareness to achieving full productivity and integration into the company culture. This comprehensive approach aids in retention and builds a resilient and well-informed workforce, prepared to face the dynamic challenges of today's work environments.

3. Research Methodology

3.1 Case Study - ElvalHalcor

In this dissertation, the overarching methodology is a case study. Case studies are an investigative approach where the researcher conducts an in-depth exploration of a program, event, activity, process, or individual (Creswell, 2009). These cases are defined by specific timeframes and activities, with the researcher gathering comprehensive information through multiple data collection methods over an extended period (Creswell, 2009).

The purpose of this case study is to discover the challenges and the weaknesses of the current onboarding process and KT methods in the company for new hires in the industry (Creswell, 2009). By focusing on these issues, the goal is to investigate deeply how these variations impact productivity and the KT to suggest remedies to deal with them.

Consequently, ElvalHalcor company participated by providing useful insights into the organizational and contextual factors affecting the research problem, which are critical for understanding issues such as onboarding processes and KT barriers. In more detail, ElvalHalcor gave accessibility to conduct interviews by sharing the list of participants and their roles to involve the personnel in the research maximising the effectiveness of the research. Also, ElvalHalcor provided details related to the year of hiring each of the participants to examine the impact of the pandemic which brought new working regimes in the industry.

In addition, ElvalHalcor shared multiple secondary data sources such as the current induction process diagram of new employees, observations and internal policy documents to create a robust and holistic view of the research object.

Table 3: *List of secondary data that ElvalHalcor provided*

Secondary Data	Description	Purpose and Method Analysis
List of Participants	Details of each participant's role and department & hire date.	Used to group interview data by role & paired participants by department.
Onboarding Process Flowchart	Visual of each step in the company's onboarding process.	Mapped stages to participant feedback on onboarding to evaluate alignment between process and feedback.

Secondary Data	Description	Purpose and Method Analysis
Onboarding Manual	Explanation of each step in the onboarding process.	Cross-checked with interview data for consistency, supporting the accurate interpretation of the process. Used for understanding the induction process flowchart and identifying tasks and processes included in each step.
Onboarding Checklist	Checklist of onboarding tasks & training (e.g., health & safety, role training); includes tracking, noting completed tasks and existing skills to skip unnecessary sessions. Both new hires and managers need to sign this document.	Assessing the checklist's effectiveness by comparing it with employee experiences to identify gaps between documented tasks and actual practice.

In Figure 8, it is presented the newcomers' onboarding checklist that ElvalHalcor use to monitor and schedule tasks that need to be implemented during the onboarding period.

Newcomers Induction-Onboarding Checklist

The following list includes items/tasks related to the department's actions and procedures. Mark with ✓, ☒ or N/A to indicate whether the new employee has received, has not received, or does not need to receive information on the respective item.

Department's Items

YES	NO	N/A	Date & Trainers Name/Surname/Signature	ITEM/TASKS

Cross Departmental Items

YES	NO	N/A	Date & Trainers Name/Surname/Signature	ITEM/TASKS (Ctrl)

Signature Manager Signature of New Hire

Figure 8: *Newcomer's induction - onboarding checklist*

The current induction-onboarding process is presented in Appendix A.

3.2 Research Design

The most reasonable approach for the research study was to use a combination of an extensive literature review and semi-structured interviews. The study aimed to gather the necessary qualitative data, which was then analysed using a thematic analysis approach (Rosala, 2022). Thematic analysis is a method of analysing qualitative data. The collected data is coded using Atlas.ti software to identify the keywords which reflect the research scope to have a reliable interpretation of the data (Atlas.ti, 2024; Rosala, 2022). This approach offered a holistic view of the onboarding process, facilitating more informed decision-making for future enhancements.

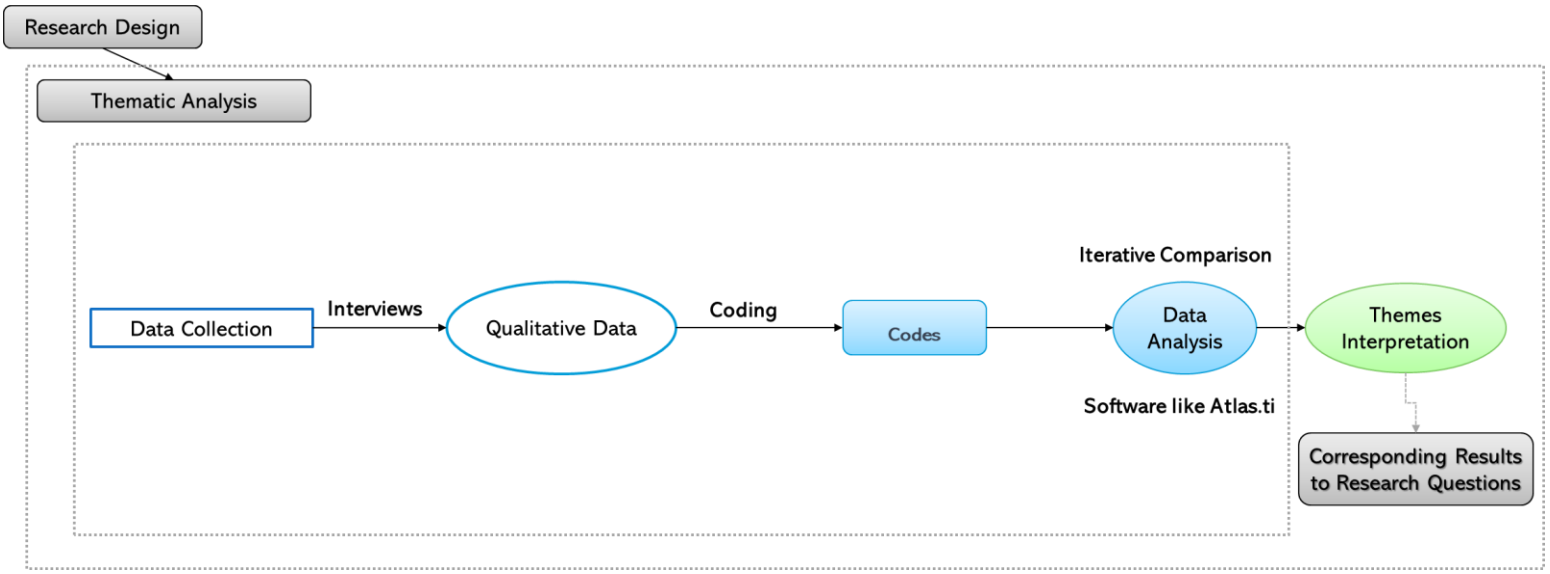

Figure 9: *Research Design Flow Chart*

In Figure 9 above, it is presented the research design of the study.

3.1.1 Sampling

The success of the research study depends on the quality of the collected data. Therefore, it was necessary to define the best target group for participating in interviews. The target population were approached with non-probability sampling methods, following the purposive sampling method (Campbell et al., 2020; Flower, 2014; Palinkas et al., 2015). Purposive sampling is a method where researchers intentionally choose participants who are deemed significant and can offer valuable insights into the study's topic (Campbell et al., 2020; Palinkas et al., 2015). As a result, this approach was very promising as it allowed finding out and

categorizing the respondents in three steps: the first step included the creation of a target group that can be sampled, the second step, the creation of the lists of specific members of the groups that have been chosen, from which it will be sampled in more depth, and afterwards, the final step was to pair the members of the groups according their department that they are working (Campbell et al., 2020; Flower, 2014).

Regarding the first step, it could easily be conducted as the target group should consist of young talents and senior employees. Then, it is necessary to classify new employees into three categories to have data from employees who were hired before, after and during the pandemic. In this way, it will be possible to understand in depth the challenges and issues which arise using the remote approach for the onboarding procedure of new employees and how this influences the whole process.

Finally, it was equally important to pair employees from the same department to avoid any potential misinterpretations. This was necessary because the departments at ElvalHalcor have different roles and responsibilities, leading to variations in their onboarding processes. Some jobs are more complex and require additional time for onboarding due to the nature of the work, while others are simpler and require less time. By pairing employees within the same department, we ensured that the specific needs and challenges of each role were accurately reflected in the study.

To sum up, in more detail, the selection of the interview participants consisted of a diverse mix of managers and employees for interviews to gain a broad view of the onboarding experience, including perspectives from before and after the pandemic (Campbell et al., 2020; Creswell, 2009; Flower, 2014; Palinkas et al., 2015). As a result, it was necessary to engage managers for insights on the onboarding design, pandemic-induced changes, and future directions. Subsequently, employees who were onboarded post-pandemic were engaged to understand their personal experiences, assess the process's effectiveness in remote or hybrid settings, and identify areas that needed improvement or where support had excelled (Creswell, 2009; Flower, 2014).

In Table 4, it is presented the selection requirements of participants and the reason.

Table 4: *Participants' selection and why*

Selection Requirements	Reason
Managerial vs. Employee Perspectives	To capture diverse viewpoints on the onboarding process, with managers providing insights on overall strategy and employees sharing personal experiences.
Managers with Extensive Onboarding Experience	To understand how experienced managers view the evolution of onboarding processes and the effectiveness of new methods.
Employees Recently Onboarded	To gain insights into the challenges and successes of recent onboarding experiences, particularly in hybrid work environments.
Involvement in Remote or Hybrid Work Onboarding	To assess the impact of remote and hybrid work on onboarding effectiveness, social integration, and KT. Especially, to compare the differences in onboarding processes before and after the pandemic, assessing changes in practice and effectiveness.
HR Manager and Talent Acquisition Specialist	To understand the strategic and operational perspectives on onboarding practices, including policy changes, recruitment, and their integration with broader talent management strategies.

3.1.2 Data Collection

In that case, semi-structured online interviews have been organised as it was the most effective approach to gather comprehensive data about the onboarding process, because it was very interesting to include different perspectives from managers and specific employees. For instance, it was very beneficial for this research to collect data from employees who found jobs before and after the pandemic to show the changes after the pandemic.

Therefore, twelve interviews have been conducted to gather detailed feedback on personal experiences regarding the effectiveness of KT and the current onboarding processes in ElvalHalcor. The participants were divided into three distinct groups to ensure a comprehensive perspective. Two HR professionals will describe the current onboarding process, and they will contribute insights on the design and implementation of onboarding

strategies, highlighting how these processes facilitate or impede effective KT. In continuous, 6 managers (Team Leaders – TL) will provide practical feedback on the transfer of knowledge during onboarding, particularly noting any adjustments post-pandemic. Lastly, 4 employees (Team Members – TM) or direct employees will discuss their direct experiences with the onboarding process, focusing on how well knowledge is transferred in different settings (in-person/hybrid) and during various periods (pre- and post-pandemic). This approach is designed to gather reliable data for scientific research.

Finally, although these divisions it was critical to pair the participants according to their roles and departments to compare the functionality and the needs of each department. Taking into consideration these steps it was increased the validity of the results.

Table 5: *Participants List*

Department: Financial Department		
Position Level	**Role of Employee**	**Pandemic Covid-19**
FIN-TL1	Financial Planning, Controlling & Costing Senior Manager	Before
FIN-TL2	Financial Planning & Reporting Manager	Before
FIN-TM1	*Financial Analysis Specialist*	*After*
Department: Manufacturing and Engineering / Process Engineering Department		
Position Level	**Role of Employee**	**Pandemic Covid-19**
PROC-TL3	Manufacturing & Process Engineering Manager	Before
PROC-TL4	Production Manager	After
PROC-TM2	*Technical Specifications Specialist*	*After*
Department: Logistic Department		
Position Level	**Role of Employee**	**Pandemic Covid-19**
LOG-TL5	Warehouse Operations Manager	After

LOG-TM3	*Order Management Supervisor*	*Before*
LOG-TM4	*Area Sales*	*Before*
Department: Business Department		
Position Level	**Role of Employee**	**Pandemic Covid-19**
IT-TL6	Business, Industrial Applications & Bi Manager	Before
Department: HR Department		
Position Level	**Role of Employee**	**Pandemic Covid-19**
HR-TL7	HR Senior Manager	Before
HR-TM5	*Talent Acquisition Specialist*	*Before*

3.1.3 Interview Questions

To ensure the reliability of interviews it was structured some specific questions which were correlated with target groups with specific characteristics. Regarding the **interview process** for managers (Team Leaders or Department Leaders), it was necessary to focus on key areas which could help in gathering essential insights efficiently. The aim was to structure questions for different respondents but with the same characteristics, attitudes, and opinions to align the answers with the same way of thinking. Following this specific pattern, it was easier to manage the volume of data and to transmit them to something that would provide interpretable results for the research (Campbell et al., 2020; Flower, 2014; Palinkas et al., 2015). Hence, it was beneficial for the conducted research to design questions for employees to assess and identify the critical problems and advantages of a specific onboarding process. This was achieved through careful consideration of the various aspects of the onboarding experience. The goal was to gather actionable insights that can help improve the process for future employees and to assess the possibility of standardising specific tasks of the whole onboarding process considering the high demand for the effective transfer of knowledge offering in the industry the powerful to minimise the waste of time. As a result, the structure of the questions is presented in Appendix B.

3.2 Data Analysis

Another important part of the whole research was the integration of findings from the interviews. The analysis of this qualitative research was conducted using **thematic analysis** (Rosala, 2022). This section outlines the systematic approach employed to analyse the qualitative data derived from interviews.

The goal of the research is to interpret the qualitative data to identify strengths and areas through the thematic analysis method for providing a reliable result for improvement of the onboarding process (Creswell, 2009; Flower, 2014). This approach gives the option to code line by line and interpret qualitative data with high complexity which is gathered through conducting semi-structured online interviews (Rosala, 2022). The approach is divided into two cycles of coding processes (Rosala, 2022; Saldaña, 2021). Before starting the coding process, the transcripts translated to the English language as the interviews were conducted in the Greek language.

The analysis involved the 1st cycle of coding the data, which focused on the identification of basic codes which are related to the research topic. Then, the next step was the 2nd cycle of coding. In this step, the process was repetitive to define the codes, reading the transcripts line by line. The next was to merge them into broader categories and develop themes, all facilitated by Atlas.ti software (Atlas.ti, 2024; Saldaña, 2021). The objective was to identify key patterns and themes relevant to the research questions, which focus on KT, and onboarding processes. In continuous during the 2nd cycle of coding, the process was repetitive to define the codes, categories and themes more clearly. It was primarily to highlight codes which reflect the conceptual framework, making the analysis adaptable to the research topic.

In this way, it would be feasible to provide a sustainable solution for the upgrade of the existing onboarding process in the industry and in general to provide scientific and reliable results (Rosala, 2022).

3.2.1 Coding Process

The coding process was initiated with a thorough review of the interview transcripts to achieve a deep understanding of the content. More specifically, the interviews were conducted in Greek language and then the transcripts were translated into English to proceed with analysis. During this phase, familiarization was key to setting up effective coding. Also,

the use of Atlas.ti software was instrumental in organizing the extensive volume of qualitative data, ensuring a systematic analysis. It played a pivotal role in facilitating the coding process, with its tools enabling efficient categorization and retrieval of data, thus simplifying the management of large quantities of qualitative information.

- **Initial Coding [1st Cycle of Coding]**

  The data was initially coded using a combination of inductive (data-driven) and deductive (theory-driven) approaches. In more detail, inductive coding allowed for the identification of patterns and concepts that emerged directly from the interview data, while deductive coding ensured alignment with existing theoretical frameworks and research questions (Creswell, 2009; Johnson & Christensen, 2014; Rosala, 2022; Saldaña, 2021).

In the Figure 10 below, it is presented the 1st cycle coding of qualitative analysis.

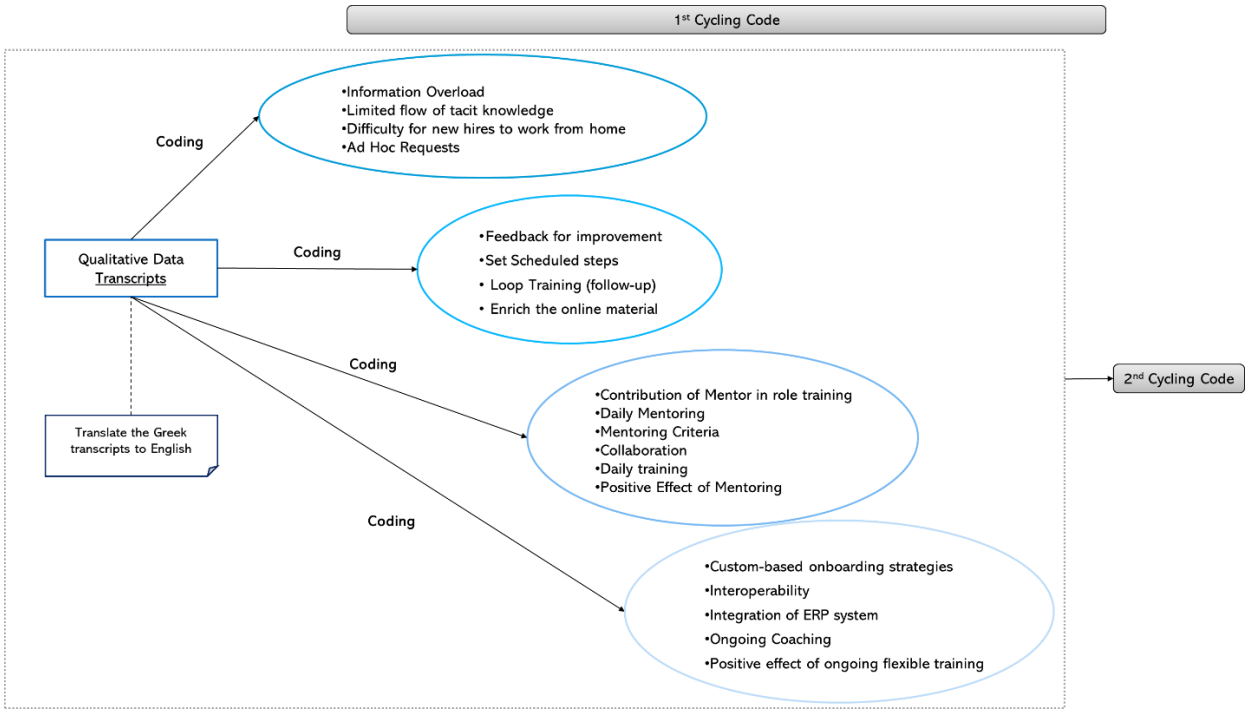

Figure 10: *Mapping out of Thematic Analysis,1st coding process and categorisation of broader themes.*

- **Initial Coding [2nd Cycle of Coding]**

  During this 2nd phase, specific responses were carefully examined, and initial codes were generated by analysing the transcripts line-by-line (Saldaña, 2021). Codes such as "Information Overload" and "Due to Workload limited availability of help" emerged as participants repeatedly referenced challenges in understanding company structures and

procedures, and the lack of structure of KT and onboarding plans as well. Figure 11 below, was exported by Atlas.ti software in cloud form, presenting the main codes and categories after the coding process.

Figure 11: *Snapshot of codes and categories, exported from Atlas.ti software (Atlas.ti, 2024).*

- **Categorizing of codes**

In more detail, after generating the final codes, they were refined and consolidated to enhance their clarity and relevance. In addition, criteria for this refinement included the frequency of the codes, their relevance to the research gap and objective, and their ability to capture the essence of the participants' experiences and perspectives (Saldaña, 2021). For instance, codes such as “Information Overload,” “Due to Workload limited availability of help,” “Specific Terms,” and “Withholding Information” were consolidated under broader categories related to KT barriers. As a result, the primary codes identified were grouped into broader categories to facilitate data organization. These categories are presented in detail in the following Table 6.

In Figure 12, it is presented the 2nd cycle coding of qualitative analysis. Also, they depicted the broad categories and themes that will be analysed in the following section 3.2.2.

Finally, in Appendix C, the picture is presented in a bigger size to be more readable.

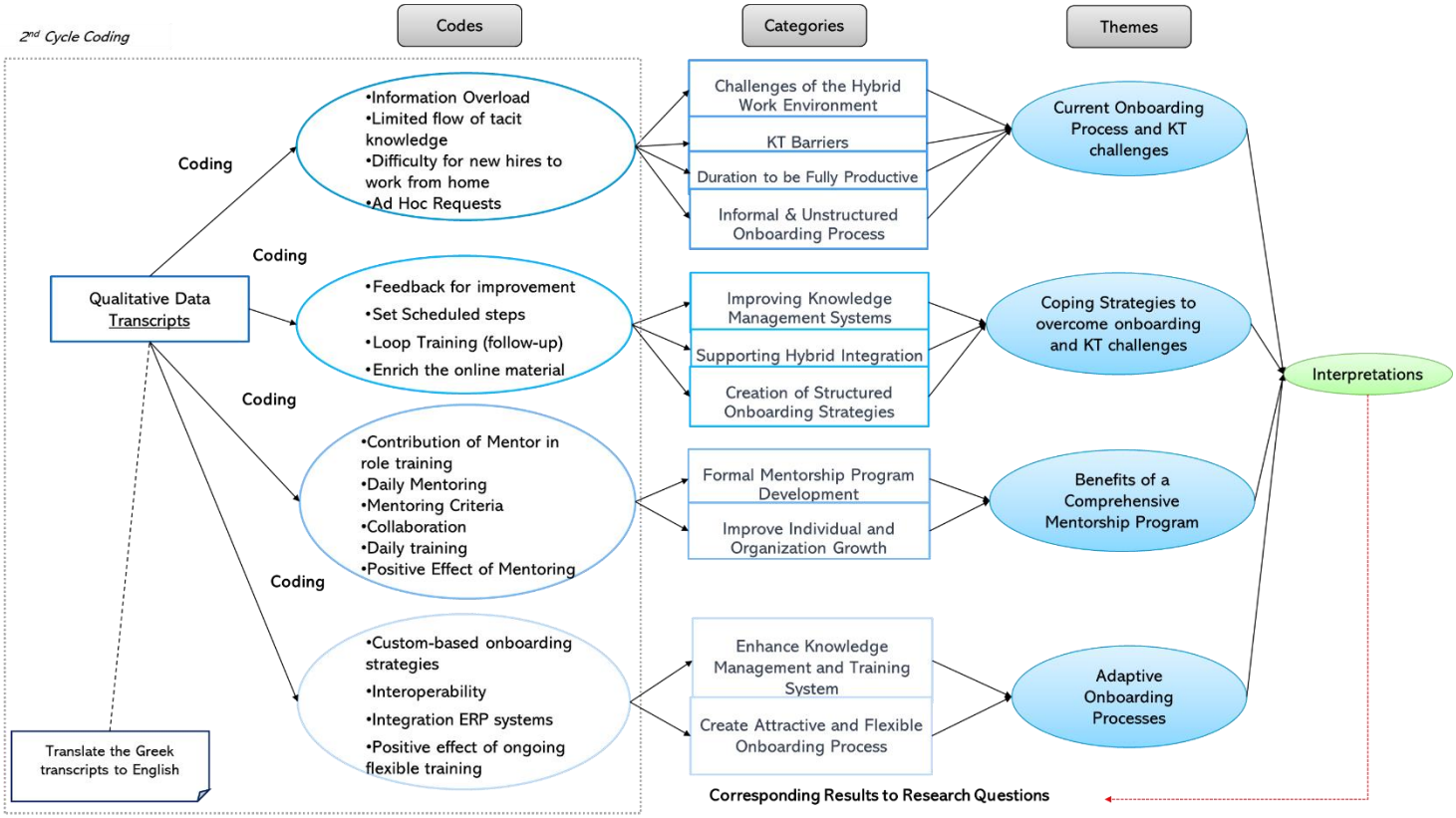

Figure 12: *Overall overview of 2nd cycle of the coding process, presenting the main correlated categories and the four significant themes.*

3.2.2 Theme Development

Following the coding process (coding and categorizing), themes were identified focusing on the refined codes and categories. In this way, related categories were grouped into themes that encapsulated the key patterns and insights from the interviews (Saldaña, 2021). The scope was to discover themes that are aligned with the research questions and objectives (Palinkas et al., 2015; Rosala, 2022; Saldaña, 2021).

- **<u>Identification of Themes:</u>**

  Themes were developed by examining the relationships between different codes and grouping them based on their similarities into broader categories (Rosala, 2022; Saldaña, 2021). Consequently, the categories of **KT barriers**, **Informal & Unstructured Onboarding Process, Challenges of the Hybrid Work Environment, and Duration demanded to Be Fully Productive** led to the creation of a border theme 1, "**Current Onboarding Process and KT challenges".** This theme captured both the common KT and onboarding challenges that new hires faced during their integration. In addition, the ability to create networks of codes and themes in Atlas.ti enabled a clearer understanding of how different aspects of

the onboarding process were interconnected, making it easier to identify and resolve overlaps and ambiguities.

- **Refinement of Themes**

  The themes were refined through an iterative review process. More specifically, each theme was re-examined to ensure that it accurately reflected the qualitative data. This review involved merging overlapping categories and codes to define more clearly the difference between themes. Finally, the guideline that was followed was to ensure that each theme was distinct and relevant to the research questions (Rosala, 2022; Saldaña, 2021).

- **Review and Refining of Themes**

  Moreover, it was a necessary final step of the analysis process to review each theme and refine it by cross-checking with the interview data to ensure they accurately represented the experiences of the participants. This step was essential to maintain the integrity and accuracy of the analysis. Then, themes were adjusted to ensure clarity and focus, particularly on issues such as the need for formal mentoring programs, onboarding structures and coping strategies to deal with challenges (Rosala, 2022; Saldaña, 2021).

Consequently, by grouping and combining in the right way broader categories and through careful refinement and organization, the analysis effectively identified key themes namely:

Theme 1: Current Onboarding Process and KT challenges

This theme addresses the current onboarding challenges and KT barriers reflecting on sub-question 1 and highlights the impact of hybrid work environments on these processes which is related to sub-question 2.

Theme 2: Coping Strategies to overcome onboarding and KT challenges

This theme proposes coping strategies to overcome these barriers and adapt to hybrid work settings reflecting on both sub-question 1 and sub-question 2.

Theme 3: Benefits of a Comprehensive Mentorship Program

This theme highlights the significance of a formal and structured mentorship program in supporting new hires, helping them navigate challenges, and accelerating their path to full productivity. This theme is related to sub-question 3.

Theme 4: Adaptive Onboarding Process

This theme offers insights and interventions to enhance the onboarding process, especially into the analysed case study ElvalHalcor. This directly addresses the main research question. Each sub-question contributes to the overarching goal of this theme, which is to provide reliable findings to make constructive interventions in the existing onboarding process of ElvalHalcor giving the space for potential value and strengthening in the future for the organization. Generally, theme 4 is fed by theme 1,2 and 3.

As a result, the whole analysis is presented in the following Table 6. This table consisted of codes, categories and broader themes. It is an overall overview of the analysis.

Table 6: *Final codes, categories and broader themes. An overall overview of the analysis.*

Theme 1: ● Onboarding, KT and Remote Working Challenges
Category 1: ● Informal & Unstructured Onboarding Process
● Ad Hoc Requests
● Company structure
● Different Personalities
● Elimination of Feedback
● Lack of a formal Mentoring Program
● Non-Set Scheduled Steps
● Non-Strict Existing Onboarding Strategy
● Supervising by Manager
● Transition of the academy to work Environment
Category 2: ● Knowledge Transfer Barriers
● Complex Systems and Procedures
● Due to Workload limited availability of help
● Information Overload
● Information Request
● Limited flow of tacit Knowledge
● Non-openness
● Possibility of not Distributing the Knowledge
● Resistance to change
● Specific Terms
● Withholding Information
Category 3: ● Challenges of the Hybrid Work Environment
● Difficulty for new hires to work from home
● Limited connection
● Limited Socialisation
● limited use of home office during onboarding
● No Remote Work Environment
Category 4: ● Duration demanded to Be Fully Productive
● 1-3 Months to Be Productive
● 3-6 To be Productive
● 6-9 to be Productive

● 9-12 months to be productive
●12-15 months to be productive
Theme 2: ● Coping Strategies to overcome onboarding and KT challenges
Category 1: ● Creation of Structured Onboarding Strategies
● Clear Define of the Role
● Feedback for improvement
● Follow-up Training
● Fundamental Training and Socialising
● Health & Safety Training
● Introductory Day
● Investing in the Education and Training of Employees
● Set Scheduled steps
● Social Events
● Standardize Tasks
● Training New hires before they Start
Category 2: ● Improving Knowledge Management Systems
● Daily Meetings for KT
● Documentation
● Encourage KT
● Knowledge Transfer between peers is more effective
● Open Dialogue
● Recording Meetings
● Share a Folder with interesting and useful information
Category 3: ● Supporting Hybrid Integration
● Enrich the online material
● Increase Social Events
Theme 3: ● Benefits of a Comprehensive Mentorship Program
Category 1: ● Benefits of Formal Mentorship Program Development
● Increase the Collaboration
● Contribution of Mentor in Role training
● Daily Mentoring
● Mentoring Criteria
● Positive Effect of Mentoring – Adding Value
● Willingness for Mentoring
Theme 4: ● Adaptive Onboarding Process
Category 1: ●Integrate Attractive and Flexible Options
● Career development
● Creating Value
● Custom-based onboarding Plans
● Flexibility in Approaches
● Synergy [Interoperability]
● Ongoing Process
● Positive Effect of working from Home
● Video Lectures and Training
Category 2: ● Enhance Knowledge Management and Training System
● Accessibility in Real-Time
● Combining input from two different sources (colleagues: same& higher level)
● Integration ERP system
● Positive effect of ongoing Training & Coaching
● Seminars for enringing skills

3.3 Deal with validity threats

To address potential validity threats and ensure the reliability of the research findings, the researcher conducted a presentation of the preliminary results to a focus group (Creswell, 2009). This focus group consisted of two team leaders from different departments and two members of the HR department. As a result, the focus group consisted of 4 in total members and the total duration of discussion into the group was around 1hour.

The inclusion of these participants was intentional, as their diverse perspectives and direct involvement in the onboarding process provided valuable insights into the validity of the findings (Creswell, 2009). During the presentation, the preliminary findings were shared, highlighting identified KT barriers, the impact of hybrid work environments, and proposed interventions for improving the onboarding process at ElvalHalcor.

The focus group discussion served as a critical step in validating the research. It allowed for triangulation of data by cross-referencing the findings with the experiences and observations of key stakeholders involved in the onboarding process. The participants provided constructive feedback, which was then used to refine the findings and ensure they accurately reflected the realities of the onboarding process at ElvalHalcor. As a result, by involving team leaders and HR members actively engaged in the onboarding process, the researcher was able to minimize potential biases and confirm that the research conclusions were not only reliable but also practically applicable (Creswell, 2009). This approach supported the credibility of the study and ensured that the recommendations made were grounded in the actual experiences and needs of the organization (Creswell, 2009).

3.4 Ethical- Confidential Considerations

Incorporating human subjects into this research demands a thorough ethical evaluation, aligning with recognized ethical principles. Safeguarding the rights of the participants is a cornerstone of the interview methodology (Laryeafio & Ogbewe, 2023). Before kicking off the study, individuals were briefed about the research objectives and the interview format (Laryeafio & Ogbewe, 2023). Furthermore, participants were informed about their consent rights and the flexibility to discontinue their participation in the study at any moment, ensuring their anonymity throughout the research process (Laryeafio & Ogbewe, 2023; TU Delft, 2024a). The consent forms were signed by each participant and securely stored by the

researcher. Additionally, a consent agreement (not a contract as there is no payment) was signed with ElvalHalcor before commencing the interviews with employees, ensuring that the collaboration adhered to all academic guidelines and standards as proposed by TU Delft. Finally, both the Data Management Plan and the Human Research Ethics Checklist were submitted through LabServant, a lab safety management system of TU Delft which ensures that all safety protocols are followed, in accordance with the standards set by TU Delft (TU Delft, 2024b, 2024a).

4. Results & Findings

Results and findings from semi-structured interviews in this study will inductively be presented. The analysis of data is based on the identification of themes that came out after conducting an in-depth thematic analysis (Creswell, 2009; Rosala, 2022).

The themes represent parts of research sub-questions that have logically been structured to answer the study's objectives. In this study, inductive reasoning in qualitative research has a high applicability as it is achieved by gathering detailed information from the participants based on semi-structured interview methods; sorting these into broader categories; building the themes into broader generalisations; and comparing these with focus groups and existing literature (Creswell, 2009). The development of these themes into patterns now follows the inductive nature of case study research, where the findings stand as interconnected concepts and are not set within a strictly causal framework (Creswell, 2009). Additionally, two specific criteria were applied to identify a code as significant. The first criterion was the frequency of mentions for each code, while the second focused on which participants mentioned it. Both criteria had to be met for a code to be deemed significant. This approach prevented cases where a single participant repeatedly mentioning the same code might lead to it being mistakenly classified as significant. Applying these criteria enhanced the reliability and validity of the results and interpretations.

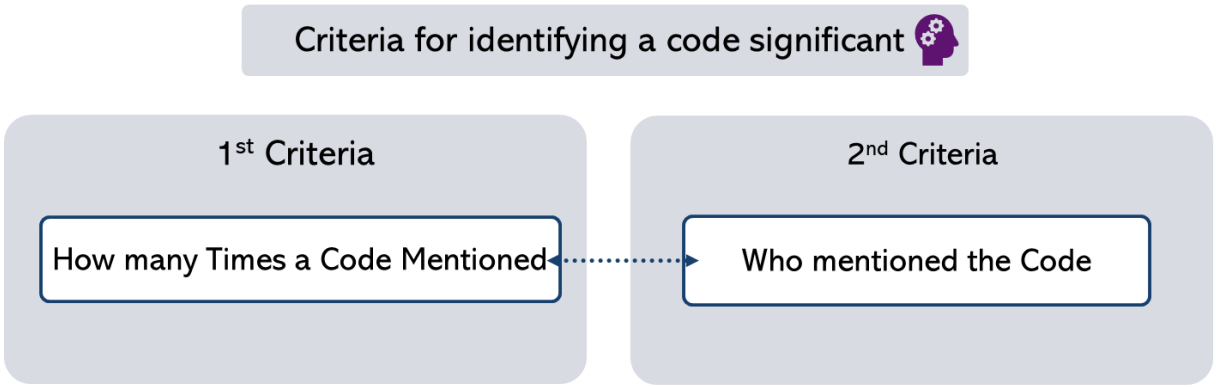

Figure 13: *Two specific criteria for identifying a code as significant.*

This approach, as described by Stake (1995), enables the formulation of "naturalistic generalisations" that have their origin in the data but are also informed by the perceptions of the researcher to provide a holistic view of the subject under investigation (Creswell, 2009).

4.1 Current Onboarding, KT and Hybrid Working Challenges - Theme 1

The scope of this theme is to address initially the current onboarding challenges and KT barriers reflecting on the first part of sub-question 1, *"**S-Q1:** What are the Knowledge Transfer - KT barriers which could influence the onboarding process of ElvalHalcor and what are the coping measures to overcome the barriers?"* and secondly to highlight the impact of hybrid work environments on these processes which is related to sub-question 2 *"**S-Q2:** How does the shift to hybrid work environments impact the ElvalHalcor onboarding process?".*

This theme consists of four broader categories in which it examines the challenges that could arise due to the informal and instructed onboarding process in companies, the KT barriers, and the challenges of hybrid work environments. Finally, the last category refers to the time required for newcomers to adapt until they are fully productive and ready to take on significant responsibilities.

In summary, it is critical to identify the key challenges that may affect the onboarding experience for newcomers. This understanding will show the path that should be followed to develop effective coping strategies for dealing with.

4.1.1 Informal & Unstructured Onboarding Process

One of the most common problems in the industry is the informal and unstructured onboarding process which could be the cause of bad experiences for newcomers. More specifically, according to the participants' responses, the most significant problem is there is no existing onboarding strategy which consists of set-schedule steps to onboard the new hire smoothly. Participants across all departments mentioned this.

For example, PROC-TL4 mentioned *"I would suggest structuring the training sequence more clearly. In my case, the training depended on where there was availability rather than following a set order that might be easier to understand"* and *"I would suggest is a more structured onboarding plan. For example, it would be better if the training followed a set schedule, rather than being interrupted by other meetings or tasks".*

Also, FIN-TL2 mentioned that *"Although the induction process was much more structured, we're still behind. There have been improvements, like more organised meetings with different departments to help you understand the work and get to know people. But there's still room*

for improvement, especially in how new employees are integrated and introduced to the company's processes".

Moreover, through extensive research, it is observed that these inconsistent onboarding plans trigger a sequence of volatilities because this inconsistency not only demands a non-equal allocation of the available time of supervisors and managers but also raises the need for ad-hoc requests.

In more detail**,** PROC-TL4 said that *"From there, the onboarding was informal. My supervisor explained the nature of the work in a couple of hours, giving me a brief overview of the department's functions. Then, I worked closely with a colleague who showed me the job and guided me through the training process. This was done step by step as part of our daily routine",* while LOG-TL5 supported that *"So, there wasn't a structured program, and my supervisor guided me."*

In addition, participant PROC-TL3 from the Process Department supported the following statement "It *could be standardized so that the employee is just informed, rather than it being something that's decided on the fly. The preparation and creation of this process are more ad hoc than part of a strictly defined procedure that must be followed step by step".*

The complexity of understanding a company's structure, which is already demanding, seems to increase in parallel with these factors. A significant percentage of participants also mention that the absence of a formal mentoring program and the lack of consistent feedback are critical factors contributing to this inconsistency. More specifically, PROC-TL3 mentioned that *"No, nothing like that. Informally, the colleague I worked closely with was my point of reference. He tried to teach me the ropes, and my supervisor was there when needed. But it wasn't a structured process; it was more about how the department functioned and how they integrated you into the work".*

Furthermore, PROC-TL4 was on the same page and stated *"We discussed these issues recently. In the commercial team, there is no officially designated mentor. There is someone who is the go-to person, but we have not strictly defined who the mentor is and what responsibilities they have towards the new person".*

Finally, Log-TL5 confirmed that there is no formal mentoring saying *"Yes, but it wasn't mentoring in the traditional sense. It was more about daily guidance on how to organize things".*

Table 7: *Frequency of Mentions Regarding the Informal and Unstructured Onboarding Process by Interview Participants.*

●Informal & Unstructured Onboarding Process	How Many Times Appeared	Who Mention What
1. Ad Hoc Requests	*(7)*	**FIN-TL1, PROC-TL3, *LOG-TM4***
2. Company structure	*(10)*	**FIN-TL2, PROC-TL3, PROC-TL4, *PROC-TM2,* LOG-TL5**
3. Different Personalities	*(2)*	**FIN-TL1**
4. Elimination of Feedback	*(5)*	**FIN-TL2, PROC-TL3, PROC-TL4, *PROC-TM2,* LOG-TL5**
5. Lack of a formal Mentoring Program	*(12)*	**FIN-TL1, FIN-TL2, PROC-TL3, PROC-TL4, *PROC-TM2,* LOG-TL5, *LOG-TM4,* IT-TL6, HR-TL7, *HR-TM5***
6. Non-Set Scheduled Steps	*(11)*	**FIN-TL2, *FIN-TM1,* PROC-TL3, LOG-TL5, IT-TL6, HR-TL7, *HR-TM5***
7. Non-Strict Existing Onboarding Strategy	*(22)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL3, PROC-TL4, *PROC-TM2,* LOG-TL5, *LOG-TM3, LOG-TM4,* IT-TL6, HR-TL7, *HR-TM5***
8. Supervising by Manager	*(19)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL4, *PROC-TM2,* LOG-TL5, *LOG-TM3, LOG-TM4,* IT-TL6**
9. Transition of the academy to work Environment	*(5)*	**FIN-TL1, PROC-TL3, PROC-TL4, *PROC-TM2***

4.1.2 Knowledge Transfer Barriers

Another critical aspect that could affect the onboarding process and therefore the overall newcomer experience is the effective KT between colleagues. However, as it is mentioned in the literature review there are a variety of barriers which could cause ineffective transfer of knowledge. Diving into the analysis and the findings of the literature review the major barriers to KT are information overload, where a new employee is loaded with so much information

and this creates extremely high pressure to manage and understand this deeply. For example, FIN-TL2 highlights the barrier of information overload, especially during the initial period of onboarding saying that *"And another point, when you're new to a role, especially if it's in a new field, the amount of information you need to absorb can be overwhelming"*. At the same time, PROC-TL4, LOG-TL5 and LOG-TM3 from a different department supported also this adding that the volume of information and work was overwhelming at first and generally this was an issue.

More specifically, PROC-TL4 underlined that *"The most important thing is the plethora of information at the beginning and the difficulty in combining different information. A gradual transition to duties would be better to prevent colleagues from being overwhelmed with information. I think this is the most basic"*.

Another factor which could affect negatively KT are the inherent inconsistent practices of KT between departments and poor documentation of processes and knowledge resulting in a limited flow of information and limited explanation of specific terms. More specifically, FIN-TL2 showcased that *"Another challenge was understanding the production process because this is an industrial company and there are specific terms that you need to learn in order to communicate properly" while,* LOG-TL5 commented, *"In my experience, there are many key terms we use to describe specific things, and if you don't use the right term, it's like speaking a different language". In continuous there are many examples which supported the same as* FIN-TM1 *interviewers who noted that "In the beginning, some things might be considered common knowledge, but I didn't know them. Over time, I realized that you have to ask because otherwise, you won't progress"*.

In addition, FIN-TL1 indicated that *"The measures we've implemented, like documenting processes and encouraging knowledge sharing, are designed to break down these silos. We believe in collaboration and that the team as a whole is greater than the sum of its parts. By ensuring that knowledge is shared and that tasks can be covered by more than one person, we create a more resilient and supportive work environment. This approach prevents issues like employees feeling stuck or unable to take time off because they're the only ones who know how to do a particular task"*.

At the same time, it is observed that the complex systems and procedures in combination with the limited availability of help due to the high workload not only from supervisors but also from peers create an obstacle to the effectiveness of KT.

This has indicated both FIN-TL2 from the Financial Department and PROC-TL4 from the Process Department saying the following *"Not really. This is one of the challenges. The time needed to properly transfer knowledge isn't always allocated, which can slow down the process. If this isn't addressed, it can make things difficult for everyone involved" and "I would suggest structuring the training sequence more clearly. In my case, the training depended on where there was availability rather than following a set order that might be easier to understand", respectively.*

The consequence of these challenges, as mentioned by the majority of participants, make access, retention, and application of key knowledge difficult for new employees, impeding their assimilation and productivity.

This unmanageable situation leads to a limited flow of tacit knowledge as it was mentioned by PROC-TL3 *"This knowledge is often in the minds of certain individuals, which we've acknowledged. The company is taking steps at the corporate level to manage this, but until then, we encourage more interaction and information sharing among team members to address this gap"* and generally the distribution and dissemination of information are flawed and ineffective.

Additionally, it is essential to point out that another critical factor contributing to instability and KT issues is the withholding of information due to concealment behaviours among colleagues. Many of the participants support that there are these kinds of behaviours in the company, PROC-TM2 said *"There was a bit of secrecy, though. A small group of people didn't like to share information readily, so it took some persistence to get the details we needed. We tried to be as polite as possible to obtain the necessary information"*

In parallel TM4 pointed out *"No, I have not noticed anything like that in my team, although it may happen in other teams. A new person may have ease in adapting but lose in other areas. We are generalizing and evaluating people based on a few behaviours we may have seen".*

Also, FIN-TL1 stated that *"Another issue is knowledge hoarding, where someone keeps information to themselves to make themselves indispensable. This behaviour can create*

bottlenecks and resentment, especially when that knowledge is needed to solve a problem or when someone needs to take time off. We've worked hard to break down these silos by promoting openness and knowledge sharing".

Ultimately, this is mainly observed in Greek companies because of the competitiveness, which leads employees to believe that by withholding information, they are securing their jobs and feeling safer. This was mentioned by participants across all departments.

Table 8: *Frequency of Mentions of Knowledge Transfers by Interview Participants*

●Knowledge Transfer Barriers	How Many Times Appeared	Who Mention What
1. Complex Systems and Procedures	*(1)*	**PROC-TL4**
2. Due to Workload limited availability of help	*(12)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL4, LOG-TL5, IT-TL6**
3. Information Overload	*(7)*	**FIN-TL2, PROC-TL4, *PROC-TM2,* LOG-TL5, *LOG-TM4,* HR-TL7**
4. Information Request	*(3)*	***FIN-TM1,* PROC-TL3**
5. Limited flow of tacit Knowledge	*(2)*	**FIN-TL1, PROC-TL3, *LOG-TM4***
6. Non-openness	*(1)*	**FIN-TL1**
7. Possibility of not Distributing the Knowledge	*(6)*	**FIN-TL1, FIN-TL2, PROC-TL4, *PROC-TM2, LOG-TM4***
8. Resistance to change	*(2)*	***LOG-TM4, HR-TM5***
9. Specific Terms	*(9)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL4, *PROC-TM2,* LOG-TL5, *LOG-TM3,* IT-TL6, HR-TL7**
10. Withholding Information	*(7)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL4, *PROC-TM2, LOG-TM3, LOG-TM4***

The total number of occurrences of each KT barrier is presented in Table 8, along with who mentioned each issue, to properly categorize the development of each department in the onboarding process. Since the company lacks a formal onboarding structure, each department follows its process, resulting in varying strengths and approaches.

4.1.3 Challenges of the Hybrid Work Environment

As it has already been mentioned after the COVID-19 pandemic, there were changes in the working environment. These changes led to a new working balance offering the possibility of working from home some weekdays. However, it is easily understandable that the hybrid work environment enables the emergence of challenges related to both to onboarding process and KT practices. More specifically, this hybrid approach does not permit socialisation resulting in limited connection of colleagues constraining the building of trustworthy relationships. In parallel, this situation creates an additional obstacle to the KT between peers.

For example, LOG-TL5 underline that "*Halcor is a large organization with many departments. I can't say I felt lost, but I never got the chance to visit some offices or meet certain colleagues. There were areas I didn't explore, and I didn't get to be introduced to everyone. So, when there is a possibility of working from home there is an additional difficulty to overcome these problems and to communicate properly".*

At the same time, IT-TL6 supported that communication in person helps to create stronger relationships and increase the effectiveness of working. He said "Being *able to connect with other colleagues, not just as voices or images on a screen, would help. Getting to know them outside of a work context, without the pressure of a project or deadline, would certainly improve communication.*".

Moreover, another participant mentioned that the remote option is useful, but it is not fully integrated yet into the organization as there are doubts about its effectiveness. More specifically, FIN-TL2 mentioned that "*During COVID, remote work was common, but now it's not as prevalent. The nature of our work often requires us to be in the office, using multiple screens and discussing things in person. While remote work is possible, it's not the norm, and it's not fully embraced yet". In addition, from the same department, FIN-TL1 added that "In the office, you can see if someone is having a bad day, and you can check in on them. When you're remote, especially with the cameras off, as is often the case, you lose that connection"* aiming to highlight the importance of having the necessary socialization with the long-term goal to keep the minimum connection for remaining productive individually.

As a result, all the above lead to avoiding the remote working option or to the limited use of the home office option because there is extremely high uncertainty of the productivity of new

hires when they are working from home. In more detail, LOG-TL5 mentioned that "*No, I don't do any remote work, and my position doesn't allow it. My work requires me to be in the factory, interacting with people, so remote work isn't feasible"* expressing not only the uncertainty about the productivity and feasibility of home office but also the difficulty to apply this hybrid approach in a similar company such as EvlalHalcor who is a factory which producing aluminium and copper.

Finally, FIN-TL1 who is a participant with extremely high experience mentioned intensively that it is challenging for new employees to have the possibility to work from home and this could lead to delays and difficulty for them to adapt to the company and role needs. In more detail, FIN-TL1 underscore that "For new employees, it's a bit more challenging because, as I mentioned, it takes six to twelve months for them to get up to speed. While they can also work from home, it's less common during the early stages of their employment because they learn better when they're physically present, working alongside their colleagues. During the pandemic, we had to switch to remote work overnight, and it was effective, but it's not the same as being in the office, especially for new hires. I can say that remote working is a trap for newcomers".

The total number of occurrences of hybrid work challenges is presented in detail in Table 9, along with who mentioned each issue, to properly identify the most critical issue.

Table 9: *Frequency of Challenges Mentioned by Interview Participants Regarding the Hybrid Work Environment*

●**Challenges of the Hybrid Work Environment**	**How Many Times Appeared**	**Who Mention What**
1. Difficulty for new hires to work from home	*(7)*	**FIN-TL1, PROC-TL4, LOG-TL5, *LOG-TM3***
2. Limited connection	*(3)*	**FIN-TL1, LOG-TL5, IT-TL6**
3. Limited Socialisation	*(8)*	**FIN-TL1, *PROC-TM2,* LOG-TL5, *LOG-TM4,* IT-TL6, *HR-TM5***
4. limited use of home office during onboarding	*(2)*	***LOG-TM4***
5. No Remote Work Environment	*(5)*	**FIN-TL2, *PROC-TL3*, PROC-TL4, LOG-TL5**

To sum up, companies in the same industry as ElvalHalcor face many challenges in implementing hybrid working environments, and the difficulty increases dramatically, especially for newly hired employees. It is challenging to find ways to smoothly facilitate their onboarding experience, as the obstacles to effective communication and understanding their responsibilities are significantly aggravated.

4.1.4 Onboarding Duration Demanded for Full Productivity

The time required for new employees to reach full productivity is a critical measure of success for companies across industries. Understanding the total duration of the onboarding process is essential, as it directly influences a company's value, efficiency, and long-term growth. The goal is to create a controllable onboarding process regarding the required time, to avoid unexpected additional which could impact team dynamics and overall productivity. Therefore, the accurate determination of the onboarding duration is vital for companies that aim to minimise these costs and optimise the integration of new hires.

Consequently, there is no double that there are several key factors which can affect the total time for new employees to become fully productive. In more detail, these factors are correlated to the complexity of the roles, the internal structure of organizations, and the availability of resources. For example, in highly structured companies with layered hierarchies, onboarding might take longer due to the need to navigate formal procedures and multiple approval levels. Likewise, roles that require specialized knowledge or a deeper understanding of the company's operations are common to lead to delays.

Furthermore, the onboarding duration can vary significantly between departments, as indicated by the data collected. More specifically, as it is mentioned through the conducted interviews, different participants for each department reported a distinct range of onboarding durations based on the unique responsibilities and expectations associated with their roles.

For instance, technical roles may demand a shorter adjustment period due to the standardised tasks. PROC-TL4 mentioned that "*Yes, for my role specifically the duration was around one and half months. For others, it might take a bit longer, around two to three months.*". Moreover, it is highlighted that the responses of participants of the same department are aligned as PROC-TL3 mentioned "*So, I would say that it takes at least a month*

for them to start walking on their own. Beyond the basics, the learning process never stops. It's an ongoing process of continuous learning".

On the other side, administrative roles might have shorter onboarding times but also this depends on the policies and procedures that they need to learn and apply on a daily basis. More specifically, LOG-TM4 supported that "*I think that, obviously, it depends on the person and the position; many factors play a role. I think 3 months is a reasonable timeframe*".

Also, LOG-TL5 from the same department mentioned that *"After about six months, I started feeling more productive. The first few months were very transitional, and it took a lot of effort to prove myself and learn. After six months, I started feeling more confident and satisfied with my progress".* This response confirms that the duration is dependent both on role complexity and the personality of the employee. Regarding the financial department, FIN-TL2 expressed the estimation saying "*It took about four months. Three to four months, roughly".* Moreover, IT-TL6 supported that a new employee needs at least one year to be fully productive in the IT department as there are complex procedures that they need to learn.

Ultimately, these variances highlight the significance of the accurate estimation of the onboarding duration for companies such as EvlalHalcor because this could lead to unexpected additional costs and ineffective allocation of resources.

Table 10: *Collected Data from Interview Participants Regarding the Onboarding Duration Required for Full Productivity*

●**Onboarding Duration Demanded for Full Productivity**	**How Many Times Appeared**	**Who Mention What**
1. 1-3 Months to Be Productive	(5)	**PROC-TL3, PROC-TL4, *PROC-TM2,* HR-TL7, *HR-TM5***
2. 3-6 To be Productive	*(2)*	**FIN-TL2, *LOG-TM4***
3. 6-9 to be Productive	*(2)*	***PROC-TM2,* LOG-TL5**
4. 9-12 months to be productive	*(0)*	
5. 12-15 months to be productive	*(1)*	**IT-TL6**

The collected data about the onboarding duration without formal mentoring are presented in more detail in the above Table 10.

4.2 Coping Strategies for Onboarding, KT and Hybrid Working Challenges -Theme 2

In the previous section, the issues and challenges that arise during the employee onboarding process were highlighted. However, the research and the industry goal in general, is to address and eliminate these problems. Consequently, this theme proposes coping strategies to overcome these barriers and adapt to hybrid work settings reflecting on both sub-question 1 and sub-question 2.

Also, this theme addresses the current onboarding challenges and KT barriers reflecting on sub-question 1 "***S-Q1:*** *What are the Knowledge Transfer - KT barriers which could influence the onboarding process of ElvalHalcor and what are the coping measures to overcome the barriers?*", and highlights the impact of hybrid work environments on these processes which is related to sub-question 2 "***S-Q2:*** *How does the shift to hybrid work environments impact the ElvalHalcor onboarding process?".*

Moreover, this theme consists of 4 more specific categories to investigate more accurate coping strategies, following the same structure and logic of theme 1, which identified the challenges. Also, it is significant to mention that this theme intends to contribute to theme 4 to propose useful interventions for resolving the current onboarding process of EvlalHalcor.

4.2.1 Creation of Structured Onboarding Strategies

One of the most significant aspects of creating one reliable and effective onboarding plan is to create a structured onboarding strategy. This strategy should be based on a fundamental principle of standardized tasks. For instance, PROC-TL4 mentioned that "*I'd suggest is a more structured and standardized onboarding plan. For example, it would be better if the training followed a set schedule, rather than being interrupted by other meetings or tasks.*". Moreover, IT-TL6 supported the same statement "*The onboarding plan and meetings could be more standardized and set-scheduled rather than depending on individual discretion and workload".*

More specifically, it is essential to invest and build in three pillars namely, standardised introduction days which should consist of fundamental training such as health & safety training, comprising set-schedule steps and meetings and follow-up training to ensure the effectiveness of onboarding and providing the necessary equipment. Each of the pillars has a special meaning since by focusing on scheduled meetings and steps, companies can provide

an organised environment in which the new employee has the chance not only to introduce themselves through social events but also, to adapt and learn smoothly their role and procedures in sequence without skipping basic training due to the limited availability of colleagues which could lead to misunderstanding and confusions. In more detail, FIN-TL1 underline that "During the first onboarding week, *we make sure their desk is set up, that they have their IT equipment, and everything else they need to start working. The welcome is mainly handled by HR, where they go through some basic steps and fundamental training".*

Also, PROC-TL3 supported that it is significant to introduce the employee to the department and to have a brief explanation of the company structure to understand the role of each department. In addition, it is equally important to standardize this step to avoid skipping the necessary steps of integration.

More specifically, it is highlighted the following statement by PROC-TL3 "*As part of the onboarding process, it's important that […] a brief introductory interview with the department heads. Beyond just meeting people, which is essential, the new colleague also gains an understanding of what each department does and becomes familiar […]. I think it's necessary, but it could also be a corporate guideline. It could be standardized so that the employee is just informed, rather than it being something that's decided on the fly".*

Regarding the follow-up training, the collected data proved that it is very promising as many participants mentioned that it could be something very beneficial as they could repeat specific tasks and training to understand deeply after the initial learning and the practice knowledge. For instance, FIN-TL2 supported that "*Having some kind of follow-up training would be beneficial. It helps reinforce what you've learned and ensures you're on the right track. It's not just about getting the initial information but also about making sure you fully understand it as you progress".*

Based on this, industrial companies should have the opportunity to clarify the roles of new hires getting constructive feedback for improvement of the process of new employees. PROC-TM2 refers "*I believe it is very useful for HR to send us a questionnaire asking about our experience, what we found positive, and what could be improved in the onboarding process for new employees. It is something that they are trying to establish during this period".*

This was mentioned by many participants of the research leading to the conclusion that these pillars are critical in ensuring consistency in onboarding across departments. Furthermore, another aspect that leads to slight integration of employees is basic training programs before coming to the company and starting the onboarding. This is also mentioned in the literature as a pre-onboarding phase. While it has the potential to add value to the onboarding plan, it can be challenging to implement due to circumstances that may conflict with employee rights. However, it is mentioned by LOG-TM4 "*Now, when I am training a colleague because the circumstances pressure us, we must move faster. On the first day, they had the same session I did with the commercial director and the team manager. The new colleague had already been trained in some basics before coming to the company".*

Finally, it is essential to underline that employee training is an ongoing process, making it a high priority for companies and supervisors (leaders or managers) to promote such initiatives internally. This helps eliminate issues like generational gaps and skill disparities among colleagues, as these hinder their harmonious collaboration. To sum up, these approaches ensure that information and guidance required by newcomers are provided systematically to minimize variability and differences in the onboarding experience.

Table 11: *Principles for Structured Onboarding Strategies*

● **Creation of Structured Onboarding Strategies**	**How Many Times Appeared**	**Who Mention What**
1. Clear Define of the Role	(14)	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL3, PROC-TL4, *PROC-TM2,* LOG-*TM3, LOG-TM4,* IT-TL6**
2. Feedback for improvement	*(1)*	***PROC-TM2***
3. Follow-up Training	*(6)*	**FIN-TL1, FIN-TL2, PROC-TL4**
4. Fundamental Training and Socialising	*(6)*	**FIN-TL1, *PROC-TM2,* LOG-TL5, *LOG-TM4,* IT-TL6, HR-TL7**
5. Health & Safety Training	*(3)*	**PROC-TL3, PROC-TL4, *LOG-TM4, HR-TM5***
6. Introductory Day	*(15)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL3, PROC-TL4, *PROC-TM2,* LOG-TL5, *LOG-TM3, LOG-TM4,* IT-TL6, HR-TL7, *HR-TM5***

• Creation of Structured Onboarding Strategies	How Many Times Appeared	Who Mention What
7. Investing in the Education &Training of Employees	*(3)*	**FIN-TL1, *HR-TM5***
8. Set Scheduled steps	*(6)*	**FIN-TL1, PROC-TL3, PROC-TL4, *LOG-TM3,* IT-TL6, HR-TL7**
9. Social Events	*(6)*	**FIN-TL1, PROC-TL4, LOG-TL5, *LOG-TM4, HR-TM5***
10. Standardize Tasks	*(5)*	**FIN-TL1, PROC-TL3, PROC-TL4, *LOG-TM3,* HR-TL7**
11. Training New hires before they Start working	*(2)*	**FIN-TL2, *LOG-TM45***

The total number of occurrences of fundamental principles for the creation of structured onboarding strategies to cope with the challenges and issues are presented in detail in Table 11, along with who mentioned each issue, to properly identify the most effective principles.

4.2.2 Improving Knowledge Management Systems

Regarding improving Knowledge Management systems, it is necessary to take significant measures to overcome any obstacle which causes a limited KT. To achieve this, it is important to have daily meetings, encouraging open dialogue. More specifically, PROC-TL4 commented that "*We have daily meetings where ideas are shared, and any successful implementations in one department are communicated to the others. We also have ongoing programs focused on industrial excellence that promote this methodology".*

In addition, PROC-TL3 supported the same statement "*Specifically, every Friday, our entire department meets to discuss the past and upcoming week, so everyone shares and exchanges ideas. We also have a shared work folder and strongly encourage sharing useful information, papers, or articles of interest. We try to keep communication channels open since we are all onsite and can interact in person. We recognize that much of the existing knowledge isn't documented, which is a challenge".* Through these two statements, it is proven that the process department applies a successful method to avoid withholding information.

Another key insight is the recognition of the importance of establishing a shared folder for core documents and onboarding materials. This resource, accessible to all employees, would significantly enhance the structure and efficiency of KT. In more detail, LOG-TM4 said "*In our team, it is the responsibility of the salesperson to maintain the file and not make it chaotic. They have created a shared folder […]. It is something structured showing us where everything is located".*

Also, the documentation and the recording meetings play a vital role in the storage of significant tacit and explicit knowledge. For example, FIN-TL1 mentioned that "*Over the last three years, we've been working on a project to document almost all the processes within the department. We've created standardized formats that include the purpose of each task, where the information comes from, who needs to be informed, how often the task needs to be done, and in what manner We also provide a detailed step-by-step guide on how to execute the task, such as logging into the system, entering specific parameters, processing the data, and then sending it to the relevant people. This is all documented in a database of tasks that almost everyone in the department has access to".*

Another important aspect is to encourage the ongoing collaboration of peers because it is proven that the KT between colleagues is more effective since there is more direct communication and familiarity on a daily basis, without the biases we might have with superiors such as managers. FIN-TM1 supported that "*Since my colleagues were knowledgeable and could share that knowledge, I didn't feel there was a gap that the manager failed to address. There were always colleagues who could help".*

Furthermore, FIN-TL1 explained intensively the need for peer collaboration, saying *"It's not so much about the process as it is about the availability of time and the person. A supervisor has to manage both people and tasks, so their time is more limited. They may step in for more critical guidance, but most of the practical KT happens between peers in similar roles. However, as you move up the hierarchy, the time spent directly coaching decreases, but the importance of what is communicated increases. So, combining input from two different people, one from the same level and one from higher up, is the ideal approach. It is something that we try to implement in our department."*

Finally, there is a need to schedule loop training, as it facilitates knowledge retention by allowing employees not only to deepen their understanding and continue gaining significant

knowledge but also to engage in discussions with their colleagues, exchanging tacit knowledge and sharing ideas. As a result, this approach can evolve into a valuable asset for the company, as loop training contribute to ensuring that critical know-how is deeply embedded within the organisation for years to come. For example, PROC-TL4 mentioned that "*If I were to go through the training now, I would understand it much better. I struggled a bit with some of the specific terms and concepts that were new to me. Although I had learned some of these things at university, you tend to forget them over time, and the practical application can be different. This was a challenge at first, but it's something that could be improved".*

While at the same time, FIN-TL2 aligned with the comment of PROC-TL4 mentioning "*It would be helpful to revisit certain stages of the induction process after you've had some time to settle in, perhaps with a more in-depth focus on certain areas. That way, you can better retain and understand the information".* The most significant actions to mitigate the possibility of having limited KT influencing not only the onboarding process but the whole operation of the company generating voids are presented in detail in Table 12, along with who mentioned each action, to properly identify the most effective mitigate measures.

Table 12: *Actions for enhancing the current Knowledge Management systems*

• Improving KM Systems	How Many Times Appeared	Who Mention What
1. Daily Meetings for KT	(6)	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL3, PROC-TL4, *LOG-TM45***
2. Documentation	*(7)*	**FIN-TL1, FIN-TL2, PROC-TL3, *LOG-TM4,* IT-TL6**
3. Encourage KT & Open Dialogue	*(9)*	**FIN-TL1, PROC-TL3, PROC-TL4, *LOG-TM4,* IT-TL6**
4. Knowledge Transfer between peers is more effective	*(7)*	**FIN-TL1, *FIN-TM1, PROC-TM2,* LOG-TL5, *LOG-TM3, LOG-TM4, HR-TM5***
5. Recording Meetings	*(2)*	**FIN-TL1, IT-TL6**
6. Share a Folder with interesting and useful information	*(3)*	**PROC-TL3, *PROC-TM2, LOG-TM4***

4.2.3 Supporting Hybrid Integration

Another important aspect that should be taken into consideration is the support of hybrid working methods. Companies need to focus on this to create sustainable methods which could support the enabling of hybrid integration approaches. More specifically, except for recording meetings it could be beneficial to enrich the online material and to increase the social events.

Regarding the online material, it is crucial to create an online database in which employees will have continuous access to online presentations, documents, and video training. This allows flexible and loop training sessions anytime. Also, online documentation gives the possibility for remote collaboration and updates in real-time. Consequently, this could increase the synergy internally in the organisations and develop the interoperability aspect using the appropriate digital tools. More specifically, FIN-TL1 supported that "*Incorporating more online elements into the onboarding process could provide more flexibility for employees".* In addition, LOG-TL5 underline that "*Home office option is permitted in exceptional cases, but generally, I need to be onsite. However, some training sessions by HR, such as those related to company culture and procedures, can be done online, which is more convenient."*

Furthermore, FIN-TL2 commented that "*The video on the production process was very helpful, and there were also some other training videos on topics like the code of conduct. Those were useful",* highlighting the positive effect of online material during the onboarding process.

However, as it is proven, supporting hybrid onboarding processes could be challenging because newcomers need to socialize and be properly introduced to their colleagues to facilitate their daily routines. As a consequence, it is critical to increase social events to bring the personnel closer, achieving at least the bare minimum level of communication to ensure effective remote collaboration.

For example, FIN-TL2 mentioned "*Additionally, activities like team lunches or company events can help build relationships. In my previous experience at the Big Four, they held events that brought everyone together. Here, similar things are starting to happen, but they're often limited to specific teams rather than the whole company. These events are useful to create familiarity and increase the way of communication within the workplace*".

Table 13: *Actions for implementing Hybrid Integration methods*

● Supporting Hybrid Integration	How Many Times Appeared	Who Mention What
1. Enrich the online material	(5)	**FIN-TL1, FIN-TL2, LOG-TL5, *LOG-TM3*, HR-TL7**
2. Increase Social Events	(2)	**FIN-TL2, HR-TL7**

In the above Table 13, there are presented the most significant actions for supporting hybrid onboarding methods.

4.3 Comprehensive Mentorship Program - Theme 3

This theme underscores the critical importance of a formalised and structured mentorship program in facilitating the onboarding of new hires, enabling them to overcome initial challenges, and expediting their trajectory toward achieving optimal productivity. Generally speaking, mentorship programs have several pros and could play a determining role in the smooth integration and adaption of new hires avoiding any destabilisation in the internal structure of the company. This theme is related to sub-question 3, which is the following.

*"**S-Q3:** How could a mentorship program positively influence the Knowledge Transfer - KT supporting hybrid work environments during the onboarding period, analysing the onboarding process of ElvalHalcor company?"*

4.3.1 Benefits Formal Mentorship Program Development

A well-structured formal mentoring program not only offers job satisfaction and better career outcomes as it is described in many studies but also accelerates the onboarding process. TL1 is strongly inclined to believe that the contribution of mentoring in reducing the required time for the adaption of new hires is very promising mentioning that "*Mentoring significantly speeds up the process by providing guidance and support that helps new employees learn faster".*

Moreover, it is proven that mentorship plays a vital role in increasing promotion and facilitating collaboration among organizational members (Allen et al., 2004). As a result, there is no doubt that it is highly important to identify and emphasize the key elements necessary for developing formal mentorship programs and to highlight the positive contribution they

could have to the onboarding process. The majority of participant in the research study expressed their willingness for the establishment of formal mentoring programs. Log-TL5 said "*In a new environment, you're unfamiliar with the existing codes of communication, and it takes time to learn how to communicate effectively with others who have been there longer. You have to learn their language, so to speak, to ensure your message is understood correctly. So, I believe that the most of employees will agree with me that it could be helpful to establish a formal mentorship program".*

Employees highlighted that mentors should meet specific criteria, such as being available and having extensive experience not only in their role but also with the internal procedures and systems used within the organization. It is not necessary for mentors to be supervisors; they can also be colleagues. The most optimal solution is to receive guidance from both sources, but it is often more convenient to communicate with colleagues at the same level, as this can encourage a more open and accessible mentoring relationship.

More specifically, FIN-TL1 supported that *"It is not necessary to be a manager or leader to become a mentor. It could also be a colleague who has been in the same position for three years and knows the job well. Often, due to time constraints, this peer-to-peer coaching happens on the job, with the new employee learning directly from the person next to them. The supervisor may intervene for more complex issues, but most of the day-to-day coaching or mentoring comes from the person sitting next to the new employee".*

Furthermore, it is supported by PROC-TL3 that it is important to have somebody to provide you with instructions about the proper workplace behaviours without focusing only on the technical information of the job. This is very helpful for the integration, especially during the first weeks. PROC-TL3 underlined that "*I consider mentoring very important, and I see it more as my responsibility to provide mentoring rather than just technical information. I focus more on helping the new colleague integrate and unfold their talents and capabilities".*

In this way, undoubtedly, mentors could provide a positive contribution with the long-term goal mentees start to collaborate with their peers exploring the role on the job. As mentioned by many participants it is very helpful to have a mentor on a daily basis offering instruction for a clear definition of the role during the training phase, so they are ready to take on responsibilities. FIN-TL2 commented that "*I think having a mentor for about six months would be beneficial. It gives you someone to go to with questions and to guide you through*

the learning process in a structured way. Even though the colleague I worked with did his best, having a more formal mentor could have been helpful", supporting that it would be more beneficial to have a formal mentor daily for approximately six months. This statement also confirms the significance of mentoring for employees defining the time for a successful mentoring program.

However, another very promising aspect that is mentioned by a high percentage of participants is that both individual and organizational development not only should be correlated with a mentoring program but also with coaching. Consequently, it is essential to understand that it is an ongoing process and organizations, and HR departments should focus on continuous coaching methods to increase the value of the organization and retention rates. More specifically, PROC-TL3 commented that "*I believe mentoring should be lifelong. From my perspective, mentoring doesn't stop; it might change in frequency or form, but it's a continuous process".*

To sum up, there is no doubt that mentoring programs are beneficial for employees. However, it should be noted that they are equally advantageous for organizations, as they can enhance the company's value and competitiveness in the market. By offering an attractive work environment where employees can quickly integrate and grow, organizations benefit financially. Although there is no formal mentoring program in ElvalHalcor, this perspective is also supported by FIN-TL1, who applied mentoring methods in the department and suggested being an example for the whole company.

FIN-TL1 supported that "*There is no strictly formal mentoring in the company, so it's more of an internal initiative within our department. We've seen that it works well, which is why we've implemented it. It's something I would strongly recommend be adopted more broadly across the company. It's one of those things that add significant value to the company, even though it might not have an immediately measurable financial impact. The effect of having a faster and more efficient onboarding process is invaluable".*

Table 14: *Contribution of Mentoring*

● Formal Mentorship Program Development	How Many Times Appeared	Who Mention What
1. Increase Collaboration	(12)	**FIN-TL1, *FIN-TM1,* PROC-TL3, PROC-TL4, *PROC-TM2,* LOG-TL5, *LOG-TM4,* IT-TL6, HR-TL7**
2. Contribution of Mentor in Role Training	(16)	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL3, *PROC-TM2,* LOG-TL5, *LOG-TM3*, *HR-TM5***
3. Daily Mentoring	*(14)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL3, *PROC-TM2, LOG-TM3***
4. Mentoring Criteria	*(2)*	**FIN-TL1, *HR-TM5***
5. Positive Effect of Mentoring – Creating Value	*(15)*	**FIN-TL1, FIN-TL2, *FIN-TM1,* PROC-TL3, *PROC-TM2, HR-TM5***
6. Willingness for Mentoring	*(8)*	**FIN-TL1, FIN-TL2, PROC-TL3, *PROC-TM2*, *HR-TM5***

In the above Table 14, there are presented the collected data regarding the formal mentorship programs.

4.4 Adaptive Onboarding Process - Theme 4

This theme offers specific insights and interventions to enhance the onboarding process at ElvalHalcor, directly addressing the following main research question.

"***Main Research Question:*** *What interventions should ElvalHalcor implement to address Knowledge Transfer - KT and hybrid work environments challenges enhancing the onboarding process?*"

Each sub-question contributes to the overarching goal of this theme, which is to provide reliable findings to make constructive interventions in the existing onboarding process of ElvalHalcor giving the space for potential value and strengthening in the future for the organization.

4.4.1 Integrate Attractive and Flexible Options

The identified key aspect through the analysis of the collected data is the critical and moderating role that attractive and flexible options play in developing successful onboarding plans within industrial companies like ElvalHalcor.

There are several actions and factors which could positively influence the onboarding plans as it is analysed in existing literature. However, the collected data from the interview participants came up to confirm the literature findings and the advantages of these options. However, many participants emphasised the significance of custom-based onboarding plans supporting that this could create room for individual career development and value for the organisations. For example, PROC-TL4 mentioned that "*The emphasis on employee development seems to be a core part of the company's culture".*

More specifically, FIN-TL1 supported the same mentioning "*Absolutely. It is essential. It is one of those things that add significant value to the company, even though it might not have an immediately measurable financial impact. The effect of having a faster and more efficient onboarding process is invaluable".*

In parallel, FIN-TL2 highlighted the need for creating custom-based onboarding plans saying "*For me, everything starts with HR. It's their job to ensure that there's a proper onboarding program in place, tailored to the needs of each role and the experience level of the employee. They should work with department heads to create a development plan that's specific to each new hire. It should be created a standard onboarding structure, but it should be adaptable to individual needs. For example, someone with more experience in a particular area might not need as much training in the basics, but the program should be flexible enough to accommodate that".*

Moreover, another significant note was that it could be beneficial to integrate flexible approaches to give the possibility initially to onboard hybrid and then to work from home. FIN-TL1 said, "*Incorporating more online elements into the onboarding process could provide more flexibility for both the employee and the mentor".* At the same time on the same page was the statement of IT-TL6 who supported that it is an advantage to give the chance for home-office and broadly to create parts of online onboarding. IT-TL6 noted, "*But overall, for us, remote work is an advantage, not a disadvantage, especially in IT". Also,* PROC-TM2

mentioned, *"I prefer to come to the office. But the option of remote work is an advantage, especially in our company, which is located too far away from Athens".*

Consequently, giving the option to attend online video lectures and training sessions enhances the interoperability and generally the synergy into the organisation. It is insightful that the company invest in sessions to help their employees demonstrate and broaden the skills of employees, as experienced employees with many years of experience mentioned that the biggest challenge and weakness is to find employees with suitable skills. For instance, PROC-TL3 underlined "*It should be done more intensively. I believe that everyone in a position of responsibility should receive lifelong training in management and leadership".*

Additionally, FIN-TL1 mentioned that "*The biggest challenge that we need to face is the lack of specific skills.* So, *it is essential to have seminars and training for developing our personal skills. For example, I recently completed a six-month training program that covered leadership, presentation skills, and how to manage people and situations effectively. I believe strongly in developing our people from within, so I've also enrolled three others from our department in the same program to prepare them for higher-level roles. Managing people requires a different skill set from doing the technical work, so we focus on training those who show potential to move into leadership positions".*

This is essential since the synergy should be integrated into state-of-the-art companies, as it is a key objective for organizations. This structure allows for interconnection between departments, cost savings, smooth operations, increased satisfaction rates, and overall expansion and stability.

More specifically, FIN-TM1 noted that "*Last year, a program was implemented where different departments provided training sessions. Each person took on a part they knew well and explained it to us. This helped us get into the workflow. Although I did not manage to attend all the sessions, all the material was recorded.* This was very helpful because I had the accessibility to arrange the training not only according to my availability but also, to repeat it many times until to understand terms deeply".

Table 15: *Benefits of integrating flexible options*

●Integrate Attractive and Flexible Options	How Many Times Appeared	Who Mention What
1. Career development	(6)	**FIN-TL1, PROC-TL4, *PROC-TM2, LOG-TM3, HR-TM5***
2. Creating Value	*(6)*	**FIN-TL1, PROC-TL3, *PROC-TM2, LOG-TM4***
3. Custom-based onboarding plans	(3)	**FIN-TL1, FIN-TL2, HR-TL7**
4. Flexibility in Approaches	*(5)*	**FIN-TL1, *PROC-TM2,* IT-TL6**
5. Synergy [Interoperability]	*(1)*	**FIN-TL1**
6. Ongoing Process	*(5)*	**PROC-TL3, PROC-TL4, LOG-TL5, IT-TL6**
7. Positive Effect of Working from Home	*(12)*	**FIN-TL1, FIN-TL2, PROC-*TM2, LOG-TM3, LOG-TM4,* IT-TL6**
8. Video Lectures and Training	*(3)*	**FIN-TL2, *FIN-TM1,* LOG-TL5, *HR-TM5***

In the above Table 15, there are presented the collected data regarding the benefits of integrating attractive and flexible options highlighting the importance of the positive effect of working from home and custom-based onboarding plans.

4.4.2 Enhance Knowledge Management and Training System

The enhancement of the Knowledge Management system to ensure the consistent transferring of tacit and explicit knowledge is another aspect that needs to be evaluated in the industry. It is significant to highlight the need of the industry to focus on systems that could promote interoperability and direct communication not only within organisations but also with the main stakeholders. For example, LOG-TM4 highlighted the importance of having interconnection with different stakeholders to flow the crucial information anytime. In more detail, LOG-TM4 mentioned "*In our team, it is the responsibility of the salesperson to maintain the file and not make it chaotic. They have created a shared folder with countries, customers, offers, and meeting notes. It is something structured, and when they created it, they showed us where everything is being saved".*

Regarding ElvalHalcor, it should be a high priority to improve the KT and training systems for optimising the current internal system of working. To achieve this, ElvalHalcor should have a holistic approach to clarifying the potential value of ongoing training and coaching. Consequently, they should focus on providing seminars to improve the knowledge and skills of employees. In this way, employees should have the opportunity to broaden their knowledge of their sector and to improve their leadership skills which are demanded for managing firstly tasks and secondary people properly. For instance, FIN-TL1 said "*Employees need to participate in seminars that their supervisor deems necessary. For example, newer employees might attend more technical seminars to help them get up to speed and fill any gaps in their skills".*

While PROC-TL4 underlined the satisfaction for training sessions and the culture of ongoing individual and organization development that it is inclined to be created within ElvalHalcor during the last years mentioning that "*There were some very effective trainings. For example, we had focused training sessions tailored to the needs of the team, like Excel courses. There were also specialized trainings, such as the one I attended in Stuttgart, Germany, for specific equipment we use. This ongoing focus on development is something I appreciate".*

However, another interesting finding is that participants mentioned that the most optimal approach is to have a variety of sources for knowledge. To achieve this, it could be nice to have a combination of mentors. More specifically, employees mentioned that combining input from two different people from the same and higher levels, respectively, is the ideal approach. This approach initially fosters direct, daily collaboration among peers at the same level, allowing for in-depth explanations of daily tasks and shared challenges. Additionally, team leaders (supervisors/managers) can play a supportive role by contributing to more specific and complex tasks and offering detailed guidance based on their experience and expertise. This comprehensive strategy creates a safe and supportive environment for newcomers, giving them the time they need to adapt and build the confidence to navigate independently. For example, FIN-TL1 supported that *"We are working to implement a different approach, where input is combined from two different sources—one at the same level and one from a higher position—as this is considered the ideal method".*

Also, it is crucial for companies especially industrial companies which need to acquire and maintain the know How to invest to integrate valuable tools and systems, such as ERP

software solutions, into the company. Specifically, *PROC-TM2 mentioned that they are trying to collect and store each piece of information into their department for future use "All of this needs to be maintained in our ERP system, specifically SAP. My main responsibility is to maintain the technical specifications for each customer within SAP".*

These systems such as ERP streamline the storage and transfer of knowledge, providing real-time access to essential information whenever needed. For example, FIN-TL1 mentioned that ElvalHalcor is inclined to invest in these systems mentioning "*We have documented almost all processes in standardized procedures, so everyone has access to this information, even for tasks outside their direct responsibilities.*".

Furthermore, PROC-TM2 supported the same statement saying that "*Yes, we have various folders on servers accessible to different departments. If we need access to something, we request it from IT, or if that's not possible, we can ask for the specific file we need*".

As a result, these improvements seem to benefit the Knowledge Management process within the company, there is no doubt that these could have a positive outcome to the onboarding process and generally to the smoother integration of new hires.

Table 16: *Actions for improving Knowledge Management and Training Systems in organisations*

● Enhance Knowledge Management and Training System	How Many Times Appeared	Who Mention What
1. Accessibility in Real-Time	(4)	**FIN-TL1, *PROC-TM2, LOG-TM4,* IT-TL6**
2. Combining input from two different sources (colleagues: same & higher level)	*(2)*	**FIN-TL1, *LOG-TM4***
3. Integration of ERP system	*(1)*	***PROC-TM2***
4. Positive effect of ongoing Training & Coaching	*(7)*	**FIN-TL1, *FIN-TM1,* PROC-TL3, PROC-TL4, LOG-TL5, IT-TL6**
5. Seminars for enringing skills	*(5)*	**FIN-TL1, PROC-TL3, *LOG-TM3***

In the above Table 16, there are presented the collected data regarding the integration state of state-of-the-art Knowledge Management & Training systems.

4.5 Focus Group Data - Validation

The findings presented to the focus group aim to validate interpretations and spark further discussion on enhancing and validating the research study's contributions both theoretically and practically. Emerging technologies like blockchain and AI appear highly promising for KT within organizations, enabling employees to securely store, access, and maintain vital information. By leveraging blockchain's transparency and AI's efficiency, companies can enhance accountability, streamline knowledge sharing, and minimize data loss, making these technologies invaluable for organizational knowledge management.

A **dual-mentor approach** for onboarding shows significant potential. This approach would consist of a general mentor responsible for foundational KT—covering company systems, platforms, mission, and vision—while a specialist mentor focuses on role-specific training. Such a structure not only accelerates new hires' acclimatization but also maximizes productivity by providing tailored guidance at each stage. Although measuring the impact quantitatively can be challenging, this hybrid mentorship model is anticipated to positively impact productivity and retention, addressing both individual and organizational needs effectively.

Additionally, implementing virtual AI assistants provides continuous, 24/7 support for new hires, which is especially beneficial for remote or hybrid work settings. Alongside AI, blockchain technology can enhance onboarding by tracking training sessions and maintaining transparent records, ensuring an efficient, accountable process. Integrating these tools throughout the onboarding journey—from pre-onboarding through role training, integration, and continuous learning—equips new hires with the resources they need to thrive from day one.

A **pre-boarding phase**, especially valuable in sectors like construction, manufacturing, and project management, prepares new hires before their official start date by offering online training through e-platforms, AI-driven modules, and VR tools. For companies like Elval Halcor, this phase allows employees to familiarize themselves with company safety standards, workflows, and industry protocols, making them better prepared to engage with strict safety standards and complex manufacturing processes. Conducted through virtual modules, VR simulations, and interactive tools, pre-boarding minimizes first-day anxiety, shortens learning

curves, and improves early confidence and productivity, as employees can practice essential tasks and understand safety requirements before entering a high-risk environment.

Beyond pre-boarding, these elements combine to form a **dynamic onboarding environment** rather than a static and non-adaptive program. This environment is designed as an ongoing process, where onboarding includes an essential final phase focused on integration and continuous learning. In this phase, employees are encouraged to broaden their skills in leadership and mentoring, ensuring they are equipped to support effective, structured mentoring systems within the organization. This approach addresses the critical question of "who trains the trainer" by building solid mentoring capabilities throughout the workforce.

In conclusion, integrating AI, blockchain, adaptive mentoring, pre-boarding, and VR tools into onboarding processes aligns with best practices from industry research while promoting operational efficiency, informed decision-making, and cost savings. By enhancing transparency, reducing misunderstandings, and supporting ongoing development, these systems contribute to a forward-thinking onboarding framework that meets the specific needs of high-risk, dynamic industries like construction and manufacturing, equipping employees to succeed and supporting organizational growth in complex work environments.

5. Discussion

In Chapter 5, the results will be synthesized using the collected data to interpret the findings, addressing each sub-question with the ultimate goal of answering the main research question. Additionally, the theoretical and practical contributions of this study will be presented, along with the limitations that should be considered for future research.

5.1 Findings Interpretation & Synthesizing Research Outcome

Starting from addressing the sub-questions will be led to the main research question.

In terms of the **first sub-question**, it is related to the KT barriers and the coping measures to moderate them, especially during the onboarding period.

S-Q1: What are the Knowledge Transfer - KT barriers which could influence the onboarding process of ElvalHalcor and what are the coping measures to overcome the barriers?

According to the literature findings in Chapter 2, there are several traditional KT barriers which are also confirmed through the collected data from the interviews in this study (Bullock & Sullivan, 2022; Haave et al., 2023; Hellebrandt et al., 2018; Siakas & Georgiadou, 2006). In more detail, these barriers are information overload; the difficulty in understanding deeply specific terms; withholding information due to hiding behaviours; and high peer workload results in limited availability for providing guidance (Yao et al., 2023).

In precarious work environments, particularly in settings with high uncertainty and limited job security, employees may engage in information withholding as a form of survival strategy. Research indicates that when individuals feel uncertain about their role or future within an organization, they may intentionally retain information to safeguard their unique value or to avoid being overshadowed by others (Sung & Choi, 2014). This behavior, often termed "hiding behaviors," is particularly common in environments with low transparency and limited trust, where employees feel that sharing too much could make them more replaceable or lessen their perceived expertise (Basu et al., 2023; Porter et al., 2019; Yao et al., 2023). In the context of the Greek market, where economic instability has heightened employment precarity, such behaviors can be exacerbated, as individuals may feel an acute need to protect their positions amidst a competitive and uncertain job landscape (Boufounou & Argyrou, 2022; Vlachos & Anagnostopoulos, 2023).

During the onboarding process, this withholding of information can significantly impact new employees who rely on their peers for guidance. In low-trust environments, experienced employees may hesitate to fully support newcomers, fearing that enabling others could reduce their own value within the organization or increase competition for advancement opportunities (Yao et al., 2023). This can be especially prevalent in industries facing high turnover rates and limited career stability, where employees adopt self-protective strategies to navigate organizational dynamics (Porter et al., 2019). Consequently, onboarding in such contexts becomes challenging, as new hires struggle to access the knowledge and support needed to integrate effectively. The combination of low transparency, survival-oriented behaviours, and job insecurity thus creates a culture where collaboration and knowledge sharing are constrained, hindering both individual and organizational growth.

To mitigate this issue, organizations can foster a culture of transparency and trust by encouraging open communication and rewarding collaborative behaviour (Yao et al., 2023). Additionally, structured onboarding programs with clear expectations and support systems can help reduce competition and promote knowledge sharing among peers(Yao et al., 2023).

Additionally, in the case of ElvalHalcor, which is an expanded and highly developed company, there are complex systems and procedures that a newcomer needs to become familiar with. At the same time, this situation creates an uncertainty and environment in which employees are trying to use survival tactics to ensure their safeguard status, as was mentioned by many teal leaders during the interviews. Therefore, these barriers are intensified by this situation because there is no formal and strict onboarding strategy within the company; There is no formal mentoring program for smoother integration of newcomers.

However, regarding the coping strategies, it is essential for industrial companies such as ElvalHalcor to establish a comprehensive approach which should consist of critical measures to mitigate the KT issues and to improve the overall knowledge management systems. Firstly, the most basic and essential step is to establish daily meetings to promote open discussion on any tasks or challenges. In this way, companies will encourage the KT culture internally and open dialogue resulting in the flow of tacit knowledge which is the most vulnerable part that needs to be addressed. Additionally, this fosters an environment of close collaboration among peers, which is a significant finding, as KT has been shown to be more effective between peers at the same level (Huang et al., 2011; Zamiri & Esmaeili, 2024).

Another approach to addressing KT challenges is for each collaborating department to establish an internal folder system. This system would store essential documents and recordings of important meetings, providing 24/7 real-time access to valuable information. This ensures that team members can access critical resources whenever needed, promoting efficiency and continuity in KT.

Finally, it is highly significant and beneficial to implement specific loop training sessions that provide employees with a repetitive learning process. This allows them to deepen their understanding of their roles and various processes, both in practice and theory. Such continuous training ensures that employees can reinforce their knowledge over time, leading to improved performance and a more thorough grasp of key responsibilities.

In terms of the **second sub-question** which was investigated in this research study, it is focused on the impact of hybrid work environments on the onboarding process.

S-Q2: How does the shift to hybrid work environments impact the ElvalHalcor onboarding process?

The shift to hybrid work environments has introduced both opportunities and challenges in the onboarding process. While hybrid models are increasingly attractive to both employees and companies due to their potential for flexibility and work-life balance, they present significant difficulties in terms of onboarding new employees.

For new hires, hybrid work can limit face-to-face interaction, which is crucial for establishing relationships and understanding company culture. The absence of spontaneous, in-person conversations makes it harder for new employees to integrate into their teams, reducing the natural opportunities for knowledge sharing and mentoring that typically happen in traditional office environments.

This lack of connection can be particularly challenging in companies like ElvalHalcor, where there is no formal onboarding or mentoring structure in place to provide new hires with the necessary guidance and support to adapt quickly.

Additionally, hybrid work environments make it harder for new hires to effectively use remote work options, such as home offices, without proper training or mentorship. This leads to slower adaptation and may prevent new employees from fully benefiting from the flexibility that hybrid work is supposed to offer.

One effective solution to improve hybrid onboarding is to enrich the online material and video training sessions. For example, by offering comprehensive and easily accessible resources, such as recorded webinars, interactive learning platforms, and instructional videos, companies can provide new hires with a self-paced learning option. A state-of-the-art method to enhance this process is the use of digital and smart technologies, such as virtual reality (VR) and artificial intelligence (AI)-driven platforms, which can overcome geographical, physical, and social barriers (Keen, 2022; Shahzad et al., 2024). These technologies enable immersive learning experiences, allowing new hires to engage in virtual simulations, collaborate in real time, and access personalized learning content regardless of location (Keen, 2022; Shahzad et al., 2024).

This need for enriched resources is particularly important in companies like ElvalHalcor, which must identify a platform that aligns with their values, needs, and culture while also selecting training courses that effectively support the hybrid onboarding process. Hence, by choosing a platform that enables remote learning and real-time collaboration, ElvalHalcor can offer targeted training programs tailored to both the specific roles of employees and the company's internal processes. This approach ensures that new hires are equipped with the knowledge and skills necessary to perform their duties within a hybrid work model. However, it is essential to select carefully the appropriate training courses, whether through online academies, industry-specific platforms, or customized internal training programs. These courses should align with the company's strategic objectives and provide new employees with the tools to understand their role, integrate into hybrid work environments, and become a part of the company's culture. As a result, by carefully focusing on both the platform and the course selection, ElvalHalcor can develop a comprehensive hybrid onboarding process that maximizes the benefits of hybrid work and enhances the overall employee experience. This approach is key to ensuring long-term success in adapting to the changing dynamics of modern work environments.

To sum up, opinions on the effectiveness of hybrid approaches in onboarding are divided. While hybrid models offer attractive benefits, their successful implementation, especially during the onboarding phase, requires more structured, patient, and supportive systems, including enhanced digital resources and smart technologies, to ensure that new hires can overcome initial challenges and fully integrate into the company.

In terms of the **third sub-question** explored in this research study, focuses on how a mentorship program could enhance KT during the onboarding process in hybrid work environments, particularly at ElvalHalcor.

S-Q3: How could a mentorship program positively influence the Knowledge Transfer - KT supporting hybrid work environments during the onboarding period, analysing the onboarding process of ElvalHalcor company?

It examines how structured mentorship can bridge the gaps in KT caused by the limitations of hybrid work, where face-to-face interactions are reduced. Hene, through an extensive analysis of the ElvalHalcor onboarding process, the study explores how formal mentorship programs can accelerate new hires' adaptation and ensure consistent knowledge sharing across departments, overcoming the challenges posed by remote work.

As it has already been mentioned in this study, structured formal mentorship programs help bridge the knowledge gap created by remote work by offering consistent, ongoing guidance and facilitating collaboration between new hires and experienced employees. More specifically, it is proven that mentors provide role-specific training, answer questions, and offer feedback, helping new employees quickly adapt to their responsibilities (Minnick et al., 2014). This interaction supports KT by transferring both explicit and tacit knowledge, ensuring that new hires can navigate tasks that might be difficult to grasp from written instructions alone (Brødsjø et al., 2023; Davenport et al., 1998; Minnick et al., 2014; Mullen & Klimaitis, 2021).

However, in the examined case study of ElvalHalcor, the absence of a formal onboarding and mentorship program has led to significant challenges. The elimination of non-structured guidance leads to the new hires often missing important training steps and struggling to manage role-specific tasks. Hence, this has slowed their integration and limited their understanding of how different departments collaborate within the company. Additionally, the lack of regular feedback and guidance means that new employees often miss opportunities for collaboration and knowledge sharing, further delaying their ability to become effective contributors. Apart from these, the elimination of feedback creates one non-friendly environment which causes limited open dialogues and socialisation.

To address these challenges, ElvalHalcor could implement a structured mentorship program incorporating different types of mentoring and systems which could facilitate the organise of programs such as AI-driven platforms and Blockchain technology (Mullen & Klimaitis, 2021; Murray, 2024; Ten Thousand Coffees Team, 2023). These systems could facilitate the pairing of mentors and mentees and schedule the training session plans according to the needs of the mentee (Allen et al., 2004; Keen, 2022; Kivinen, 2023; Murray, 2024; Panda et al., 2024; Peisl & Shah, 2019; Shahzad et al., 2024; So Suk Yi et al., 2020; Viswanathan et al., 2019; Zamiri & Esmaeili, 2024).

Hence, it is essential for an effective and formal structured mentorship program begin with the careful selection of mentors and type of mentoring (Murray, 2024; Ten Thousand Coffees Team, 2023). Mentor selection criteria should include experience, communication skills, commitment, and alignment with mentee goals (Mullen & Klimaitis, 2021). The mentor's expertise ensures they can guide new hires effectively, while strong communication skills foster a supportive relationship (Murray, 2024). Additionally, mentors must commit 1-2 hours per week to mentoring sessions, which has been shown to significantly improve onboarding and KT (Murray, 2024). Additionally, to enhance the onboarding process and overcome the KT barriers, could integrate AI-driven mentoring platforms. These could be used to automate the matching of mentors and mentees, optimizing the process by considering skills, learning needs, and progress (Kivinen, 2023; Mullen & Klimaitis, 2021). This automation reduces the administrative burden of managing the mentoring process and ensures that new hires receive personalized guidance when needed (Kivinen, 2023).

In parallel, to maximize the effectiveness of the onboarding process, ElvalHalcor could incorporate multiple mentoring styles. For example, Peer mentoring could help new hires manage day-to-day tasks by facilitating knowledge sharing between colleagues at the same level and increasing collaborative culture (Mullen & Klimaitis, 2021; Ten Thousand Coffees Team, 2023). Also, One-on-one mentoring could provide personalized guidance and feedback, helping new hires understand their specific responsibilities in depth. Moreover, another type of mentoring is Group mentoring which could promote cross-departmental collaboration, enabling new hires to gain a broader understanding of the company's operations, and norms enhancing overall KT(Mullen & Klimaitis, 2021).

Furthermore, virtual mentoring can be integrated into the onboarding process to ensure that hybrid and remote employees receive consistent support and feedback (Mullen & Klimaitis, 2021). Through video calls and messaging platforms, mentors can engage with mentees in real-time, ensuring that KT is not hindered by the limitations of remote work (Mullen & Klimaitis, 2021). AI tools can further enhance this by automating scheduling, ensuring consistent mentor-mentee meetings, and optimizing mentor assignments based on mentees' progress and needs (Kivinen, 2023).

Another innovative solution for enhancing mentoring and onboarding at ElvalHalcor is the establishment of blockchain technology integrated into the existing company's ERP system (Naval, 2023). In this way, blockchain-powered smart contracts can be used to automate tasks such as assigning mentors or enrolling new hires in tailored training modules (Iyer et al., 2020; Panda et al., 2024; Viswanathan et al., 2019). Smart contracts trigger tasks based on predefined criteria, such as when a new employee reaches a certain milestone, the system automatically assigns the most suitable mentor. This ensures that the onboarding process follows a clear and structured path, minimizing the risk of human error and enhancing transparency (Panda et al., 2024; Peisl & Shah, 2019).

In conclusion, the implementation of a structured mentorship program at ElvalHalcor, supported by virtual mentoring, AI-driven solutions, and blockchain technology, would significantly enhance KT during the onboarding process, particularly in a hybrid work environment. These measures not only address the current onboarding gaps but also foster a culture of continuous learning, innovation, and long-term organizational success (Allen et al., 2004; Kivinen, 2023; LinkedIn Learning, 2024; Mullen & Klimaitis, 2021; Murray, 2024).. Hence, by combining peer, one-on-one, and group mentoring, the company can streamline onboarding, increase collaboration, and improve the overall employee experience (Murray, 2024). The use of AI can automate mentor-mentee pairing, ensuring optimal matches based on skills and goals, while blockchain technology can enhance transparency and security through smart contracts, automating tasks such as paring mentors, assignments and training enrolment (Kivinen, 2023; Panda et al., 2024). These interventions offer numerous benefits, including reducing the time for new hires to reach full productivity by **25%** to **50%**, improving employee engagement and retention by 20%, and enhancing cross-departmental knowledge sharing, which can boost collaboration and KT by 30-40% (LinkedIn Learning, 2024).

As a result, in the case of ElvalHalcor, the collected data on the total time required for a newcomer to become fully productive showed that this duration varies depending on the complexity of the role and the availability of the mentor. More specifically, each department provided different estimates. Therefore, after the qualitative analysis of the data and assuming that a formal mentoring program could reduce the onboarding time by 25%, the following Gantt chart is presented.

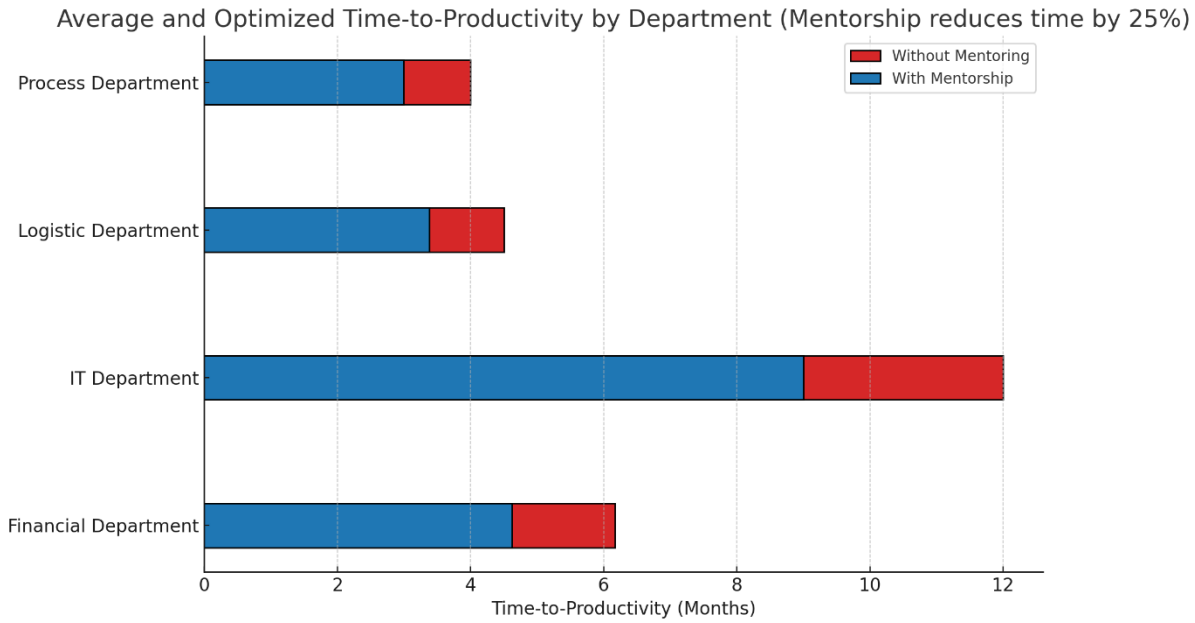

Figure 14: *Gantt Chart showing the 25% reduction in time to productivity for each department before and after implementing the formal mentorship program.*

This chart demonstrates the time savings that each department could achieve if a comprehensive mentorship program was implemented across the company. The assumption of a **25% reduction** was chosen based on literature, which suggests that mentoring can reduce onboarding time by **25-50%** (LinkedIn Learning, 2024). However, in our case, we opted for a more conservative estimate of 25%, considering the fact that **informal mentoring already exists in the company** and occurs at regular intervals. To sum up, we concluded that the **25%** reduction is a more realistic expectation for ElvalHalcor.

In conclusion, after addressing the three sub-questions, it is now possible to respond to the main research question. By synthesizing the conclusions and findings from the analysis conducted thus far, we can provide specific and reliable recommendations for improving the current onboarding process at ElvalHalcor. These insights will help the company implement

targeted interventions that enhance KT and streamline onboarding practices, ultimately fostering a more efficient and effective organizational environment.

Main Research Question: What interventions should ElvalHalcor implement to address Knowledge Transfer – KT and hybrid work environments challenges enhancing the onboarding process?

Firstly, it is important to highlight that, despite the general observation that there is no official onboarding process and mentoring program in the company, the data collection and analysis indicate that there has been progress and improvement within the company. In recent years, there has been significant development in the company regarding the onboarding process. Specifically, the most recently hired employees, who joined the company after the pandemic, describe the process as more organized, noting that steps are being taken to record important information online, such as documents and meetings. In this way, they enrich their database to prevent the loss of valuable information. At the same time, it appears that all departments individually attempt to implement an informal, unstructured mentoring system by assigning colleagues to guide new hires.

Additionally, as illustrated in Figure 16 (Appendix A), there is currently an onboarding process in development and implementation. However, since it is still in its early stages, the benefits are not immediately apparent, and there is room for improvement through its application and the learning pace, which plays an important role, especially in such repetitive processes.

Therefore, based on the literature review findings and the data collected through interviews, this scientific research will propose reliable and targeted changes to improve the onboarding process at ElvalHalcor.

By examining various theories, such as the SECI model, which presents the continuous process of explicit and tacit knowledge, and the ADKAR model, which particularly supports that this process is continuous and based on change management (Hiatt, 2006; Hoe, 2006), it is evident that the continuous improvement of internal processes within organizations is of critical importance (Scott et al., 2022). This aims to continually improve employee experience, minimize delays, and avoid unexpected costs.

Based on the ADKAR model and the feedback from the interviewees, the goal should be for the onboarding process to be based on two key principles

I. Firstly, improving synergy within the organization by focusing on interoperability
II. and secondary, adaptability.

Regarding synergy, as already mentioned in the previous sub-questions, modern technological systems must be introduced that dynamically support communication and remote work. In this way, communication and collaboration within the work environment are facilitated, increasing the efficiency and dissemination of information within the organization. These digital tools increase interoperability facilitating synergy in organisations.

At the same time, regarding adaptability, it is equally important to offer systems and tools that can modify the process to fit and optimize according to the needs of the company and the employees. Therefore, it is essential to introduce systems such as smart contracts (based on blockchain technology), which are compatible with the ERP systems already in use by the company (Naval, 2023). ERP systems can feed smart contracts with large amounts of information for more accurate results. Smart contracts can automatically and quickly execute processes based on the profile of the new hire. This tool will help tailor the onboarding strategy to the employee's profile, ensuring they attend the necessary seminars and training sessions essential for their integration (Nakayama et al., 2024; Panda et al., 2024; Peisl & Shah, 2019; So Suk Yi et al., 2020; Viljakainen, 2024; Viswanathan et al., 2019).Using these state-of-the-art systems, custom-based onboarding processes can be created, and specific scheduled steps can be set automatically so that everything is done coherently and consistently, facilitating the smooth and efficient assimilation of information by the new hire (Hiatt, 2006; Karambelkar & Bhattacharya, 2017; Panda et al., 2024; Peisl & Shah, 2019; So Suk Yi et al., 2020). This is correlated with the philosophy of the ADKAR model, presenting the promising positive impact of the combination ADKAR model philosophy to the new technologies for taking advantage. Many employees have complained about the lack of adherence to schedules and the disorganized training, which leads to confusion as they do not receive the correct information at the right time to build their knowledge step by step.

Additionally, tools such as VR are extremely important, especially in companies like ElvalHalcor, which follow specific aluminium and copper production processes. More specifically, industrial companies applying this technology can more easily and quickly explain their processes to employees in a safe environment (Doolani et al., 2020; Stecuła, 2023). As a

result, they not only accelerate the adaptation process but also enhance the health and safety standards of the organization, a major concern in the industry (Stecuła, 2023).

Moreover, a crucial role plays the integration of the mentorship program during onboarding (Murray, 2024). There is no doubt that mentoring, besides speeding up the onboarding process, offers multiple benefits, such as increasing employee satisfaction, improving the overall employee experience, and contributing to the retention and KT (Ahmed, 2021; Allen et al., 2004; Minnick et al., 2014; Mullen & Klimaitis, 2021). However, when proper mentoring is implemented, combining multiple types of mentoring depending on the onboarding phase and the candidate's profile, and when it is supported by technology systems, all these benefits are optimized even further, offering hybrid onboarding (Ten Thousand Coffees Team, 2023). These systems can contribute to better organization of the onboarding plan and more effective guidance during this period. For example, when explaining the company's policies and systems, the appropriate mentor can be selected. In contrast, for more specific role-related processes and technical knowledge, another, more specialized mentor can be chosen. This dual-mentor approach could maximise the effectiveness of mentoring program and generally could reduce the demanded onboarding duration. AI-driven mentor pairing and blockchain-based tracking systems help implement these optimized processes (Kivinen, 2023; Panda et al., 2024).Also, the ERP system could feed this technology for instance to give data about the availability of each mentor and mentee and schedule everything in alignment with this constrain (Naval, 2023). For example, peer mentoring for managing daily tasks could be introduced right after the "Welcome & Brief Introduction to the Team" step in the Manager section. This would allow new employees to immediately connect with their peers and engage in knowledge sharing that helps manage their everyday responsibilities (Mullen & Klimaitis, 2021; Ten Thousand Coffees Team, 2023).

A critical first step is establishing a pre-onboarding phase, where new hires can engage in training sessions before their official start date (prior to the welcome day). In this phase, employees complete online onboarding through study materials and guidance provided by AI-driven platforms. This setup allows them to acquire essential foundational and procedural knowledge, ensuring they are already familiar with the organization's specific functions by the time they arrive. This approach facilitates a smoother and faster adaptation, helping to create a welcoming, high-trust environment from the outset. Another significant step is the

establishment of loop training (follow-up), giving employees the opportunity to organize all the information they have received after a period of adaptation and having gone through all the stages required by their role. Thus, after seeing the processes in practice that were explained to them theoretically; by repeating the process, they have the opportunity for better assimilation.

Finally, another important intervention which should be implemented in the final stage, is the official establishment of a phase in which the employee has the opportunity to evaluate the process. It is important to clarify that the employee onboarding process is a dynamic and continuous process, where constant improvements and changes are necessary. It is a fundamental process that should always operate optimally. Therefore, collecting feedback for improvement is of great importance and should be taken into account, as it not only benefits the enhancement of the integration process but also reflects the company's culture of knowledge sharing and open dialogue, taking into account the needs of the employees. In the case of ElvalHalcor, this does not happen systematically, but rather on a case-by-case basis, which is something that needs to be corrected.

Appendix A presents the Figure 17 , which is an updated version of Figure 16 (the current process of ElvalHalcor). This figure highlights the proposed interventions in the current onboarding process. The updated process could serve as a model for other industrial companies and can be validated through multiple applications across similar organizations.

5.2 Theoretical contributions

The present research contributes significantly to the literature on KT and onboarding in hybrid work environments by proposing a structured, dual-mentor model combined with advanced technological tools. Building on frameworks such as SECI (Socialization, Externalization, Combination, and Internalization) and ADKAR (Awareness, Desire, Knowledge, Ability, and Reinforcement), this study integrates mentorship and onboarding, adapting these to the context of ElvalHalcor, a Greek manufacturing company. By promoting a **dual-mentor approach**, where one mentor provides general, organizational-level guidance and another offers role-specific technical and procedural knowledge, the onboarding process is tailored to efficiently address the needs of new hires in terms of both explicit and tacit knowledge. More specifically, the dual-mentor approach, proposed as a solution in this study, is designed to

avoid complexity by limiting unnecessary handovers and reducing potential confusion that can arise from involving multiple stakeholders. By assigning one general mentor for organizational knowledge and one specialist mentor for role-specific skills, new hires benefit from a **clear and structured onboarding** experience without the disruption of multiple transitions between mentors. This streamlined approach maximizes both efficiency and clarity, enhancing KT without increasing complexity, and creates a robust yet straightforward onboarding framework that can be replicated across industries.

Furthermore, this study explores **technological integrations, including AI, blockchain, and VR**, to enhance onboarding quality and security. Blockchain technology, in particular, is employed to secure and monitor mentoring activities, adding layers of transparency and accountability, which are underexplored dimensions in KT literature. Additionally, **VR offers immersive, risk-free training** environments for technical tasks, ensuring that safety standards are maintained while minimizing workplace hazards. Moreover, through the incorporation of **AI-driven technology**, the onboarding process can further adapt to hybrid and online environments, which have become increasingly relevant post-COVID-19. AI technologies not only streamline the pairing of mentors and mentees but also support continuous and virtual mentoring, providing flexibility and efficiency in hybrid onboarding. This approach allows for automated task management and **custom-based onboarding plans**, which ensures that onboarding procedures are both organized and personalized. These technologies are especially relevant in industries like manufacturing and construction, where hands-on tasks and compliance with safety protocols are critical.

The research findings confirm the presence of **low-trust environments in Greek companies** and a tendency to withhold information, which poses barriers to effective KT. Through the dual-mentor model and the adoption of secure and transparent digital tools, these trust issues can be mitigated, thereby fostering a more open and collaborative onboarding environment encouraging the knowledge sharing. To further streamline the onboarding process, this study introduces the concept of a **pre-onboarding phase**, which provides new hires with online materials before their official start date. This approach not only prepares employees by reducing initial information overload but also helps to lower stress levels, allowing them to assimilate information more effectively. For policymakers and company leaders, incorporating a pre-onboarding phase or offering a paid home-study option for the

first week can ensure that new hires are both prepared and aligned with company values, goals, and policies prior to their first day in the office.

Another important finding is that the onboarding is highlighted as an **ongoing - dynamic process**, where **integration and continuous learning** are prioritized. Post-onboarding coaching is essential to support employees' long-term development and mastery of skills, ensuring that they continue to build their competencies. This aligns with the notion of "training the trainer," where organizations are encouraged to invest in preparing mentors and managers to sustain reliable and effective mentoring programs over extended periods.

In the context of construction management and project management, where teams are often structured around short-term, high-intensity projects, this research offers timely insights. The dual-mentor approach is particularly valuable in construction, where onboarding often involves integrating both remote and on-site teams quickly to meet demanding timelines. Literature underscores the importance of effective onboarding in construction management, particularly for short-term project teams, as efficient KT is directly linked to project success and team cohesion. The emphasis on leadership within project management is further explored through mentoring, as leaders play a pivotal role in shaping team dynamics and bridging remote and in-person collaboration. By Modeling effective communication and problem-solving, leaders in construction management can guide new hires in a manner that supports both their technical and relational integration into the team.

To sum up, this study emphasizes the need for **integrated dual-mentoring and digital tools in onboarding** to meet the unique demands of hybrid environments. As demonstrated within the Greek industry, these structured KT and mentoring practices are essential for fostering resilience and adaptability in teams, positioning new hires to contribute meaningfully from the outset and supporting long-term knowledge retention and leadership development. As a result, this research not only extends existing literature by analysing and validating the unique barriers to KT in hybrid work environments and proposing formalized mentoring solutions that can reduce onboarding time by up to 25% but also, encourages the construction and project management sectors to explore how dual-mentorship and digital technologies can collectively advance onboarding and leadership practices in ways that resonate with project-based work demands, creating a foundation for future research and policy development in onboarding standards. Concluding, form overall perspective, the study emphasises to the

consideration of the human aspect within socio-technical systems, showing how technology-driven solutions, such as AI, VR, and blockchain, can support employee well-being by fostering a trusted and transparent working environment that prioritizes both personal development and psychological safety.

In the following Figure 15, it is presented the updated Conceptual Framework (Figure 2) to understand better the theoretical contribution of this research.

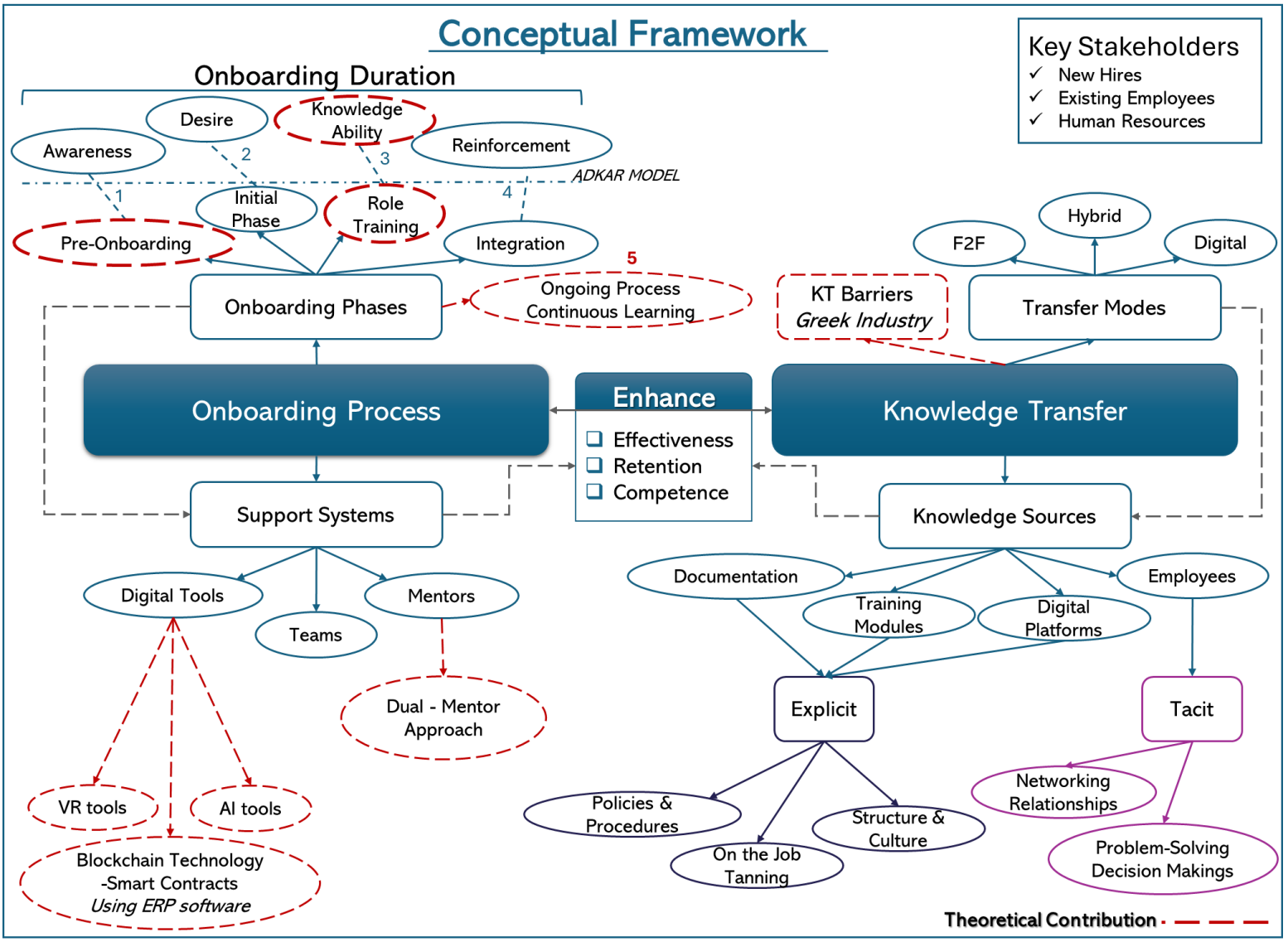

Figure 15: *Updated Conceptual framework considering the theoretical contribution of the present study.*

5.3 Practical Implications

On a practical level, this research provides actionable interventions for ElvalHalcor and other companies in the industrial sector, offering a pathway to improve their onboarding processes.

Hence, by implementing a formal mentorship program that combines peer, one-on-one, and group mentoring, alongside the integration of AI for mentor-mentee pairing and blockchain for transparent tracking of onboarding milestones, the company can significantly streamline the hybrid onboarding process, boost employee engagement, and enhance productivity. Additionally, these interventions address the current gaps in ElvalHalcor's informal onboarding practices and offer a structured, scalable solution adaptable to the hybrid work model. The findings demonstrate that these strategies of applying custom-based onboarding plans alongside dual mentor approach incorporating digital tools could reduce the time for new hires to reach full productivity by 25%, ultimately fostering a culture of continuous learning and improved organizational efficiency.

Moreover, this structured approach to onboarding and KT can benefit not only ElvalHalcor but also the broader industrial sector, particularly in the Greek market, where traditional onboarding methods are still widely used. The research promotes a shift from these conventional approaches towards more adaptive, custom-based solutions utilizing state-of-the-art technologies like AI, blockchain and VR. Ultimately, this transition would enable companies to leverage the benefits of faster KT, higher productivity, and enhanced employee engagement, positioning them to better navigate the complexities of hybrid work environments and increasing their competitive edge in the AEC industry.

5.4 Limitations

In studies focusing on the relationship between KT and the remote working environment—a trend that became more common in many industries after the pandemic—the main challenge that arose was the lack of scientific research and examples to draw from. This problem was exacerbated by the difficulty of finding companies willing to collaborate and share their data for the research. These challenges made it difficult to draw strong, widely applicable conclusions and test theories across different types of businesses.

Additionally, this limited the study’s ability to fully understand how KT practices affected remote work environments and hindered the use of findings to help other companies or sectors, especially when creating a framework for onboarding new employees. Moreover, the limited amount of quantitative research on mentoring made it significantly harder to find reliable and concrete conclusions about its impact on industrial companies like ElvalHalcor.

Finally, another significant challenge was the difficulty in recruiting the required number of participants due to the distance, remote communication, and the limited availability of employees at ElvalHalcor, who were often dealing with high workloads. These factors, combined with the remote nature of the communication, made data collection and evaluation even more difficult. This also serves as further evidence that remote work carries additional obstacles, as demonstrated by personal experience. As a result, to adapt and proceed with the research, it became necessary to adjust expectations and methodologies to accommodate these limitations.

5.5 Future Research

Future research could build upon these findings by examining the long-term effects of mentorship programs integrated with AI and blockchain on employee retention and career development.

Additionally, further studies could explore the scalability of these solutions in other industries beyond manufacturing, as well as how the use of VR and other immersive technologies could enhance the hands-on aspects of onboarding in hybrid or remote settings. It would also be beneficial to conduct empirical studies that validate the assumption regarding the positive effect of 25% on the acceleration of onboarding duration through the integration of structured mentoring across different organizational contexts to generalize these findings more broadly. It would be beneficial to conduct quantitative research to validate these results considering more industrial international companies and collecting data through questionnaires by a high number of participants.

Finally, future research could investigate the impact of integrating these advanced technologies into mentorship programs on cross-generational knowledge sharing and leadership development within organizations.

6. Conclusion

In conclusion, even though there were some limitations in the current research study, the findings provide crucial insights into onboarding processes and the strategies to overcome the KT barriers caused by informal and unstructured onboarding processes, as well as hybrid work environments. This present research study has searched for and presented ways of effective intervention to improve the process of ElvalHalcor. The proposed scheme covers structured dual mentoring, including peer, one-on-one, virtual and group mentoring, which will help fill the deficiencies currently characterizing the onboarding practices of the company. These mentoring strategies, combined with AI-driven mentor pairing and blockchain for secure and transparent tracking of progress, represent a more modern, scalable solution adaptable to the hybrid work model. These solutions ease the onboarding process, improve employee engagement, and reduce the time to full productivity, putting companies such as ElvalHalcor in a position to rise effectively to the challenges of hybrid work environments.

Additionally, this research, at the same time, underlines the greater business value in the industrial sector as a whole and for the Greek market, where traditional onboarding practices still prevail. The transition that the paper proposes from classic to adaptive, customized onboarding solutions with the support of cutting-edge technologies such as AI and blockchain offers the opportunity for faster KT, higher productivity of employees, and effective internal collaboration. Better support for new hires, more productive continuous learning, and a thoughtful response to the challenges of remote and hybrid work setups-better enabled by modern approaches lies the possible competitive advantage as organizations become agile and better positioned to cope with the evolving dynamics of the workplace.

To sum up, this research shows that adopting technology-enhanced mentorship programs offers both short-term benefits, like speedy onboarding and better knowledge retention, and long-term gains in organizational efficiency, innovation, and adaptability. For companies like ElvalHalcor and other industrial organizations (AEC), transitioning from traditional onboarding to these modern, mentoring-focused models is essential for thriving in today's work environment. By fostering teamwork, continuous improvement, and innovation, these organizations position themselves for sustained success.

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Appendix A

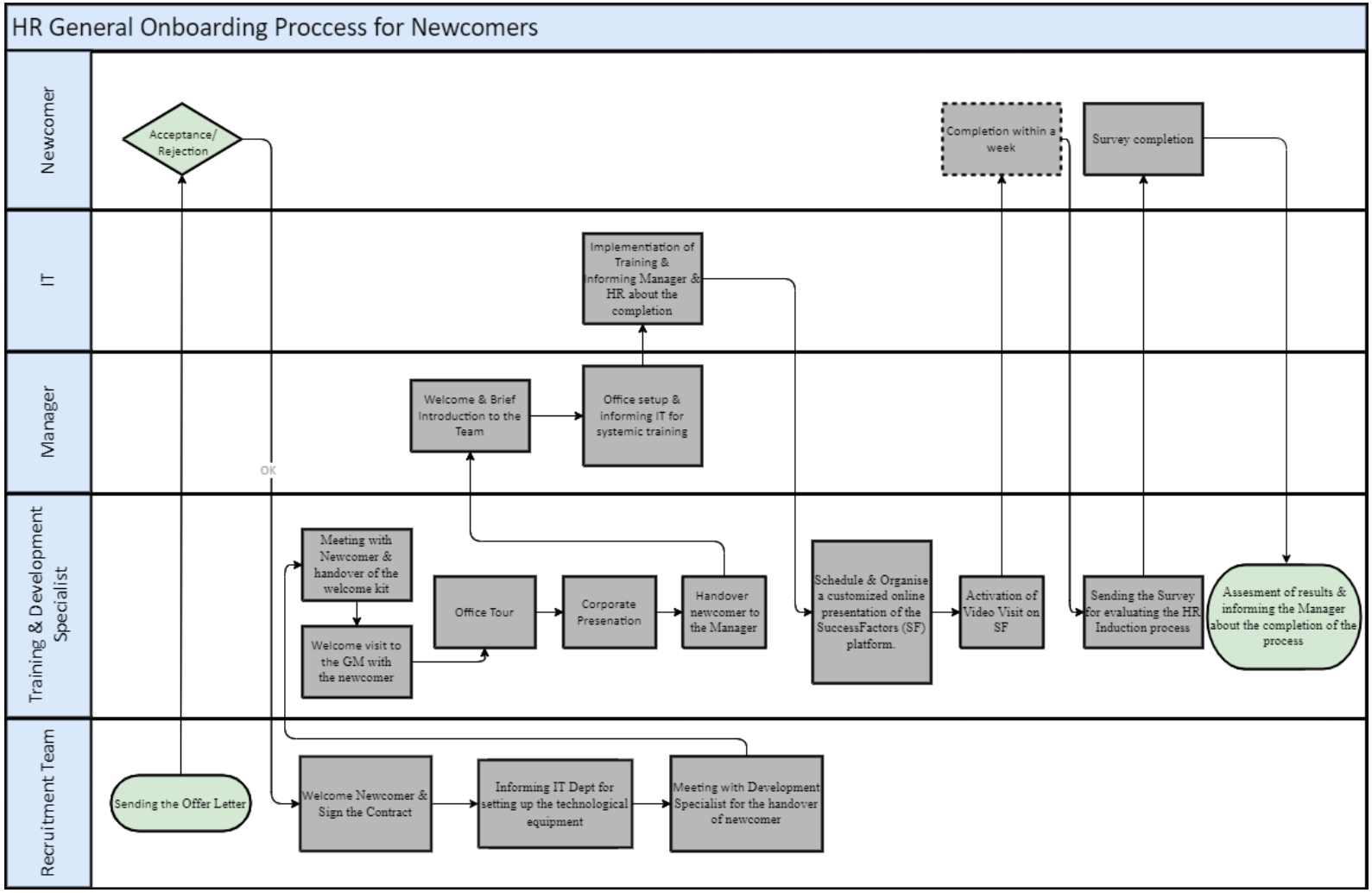


Figure 16: *Current Onboarding Process of ElvalHalcor*

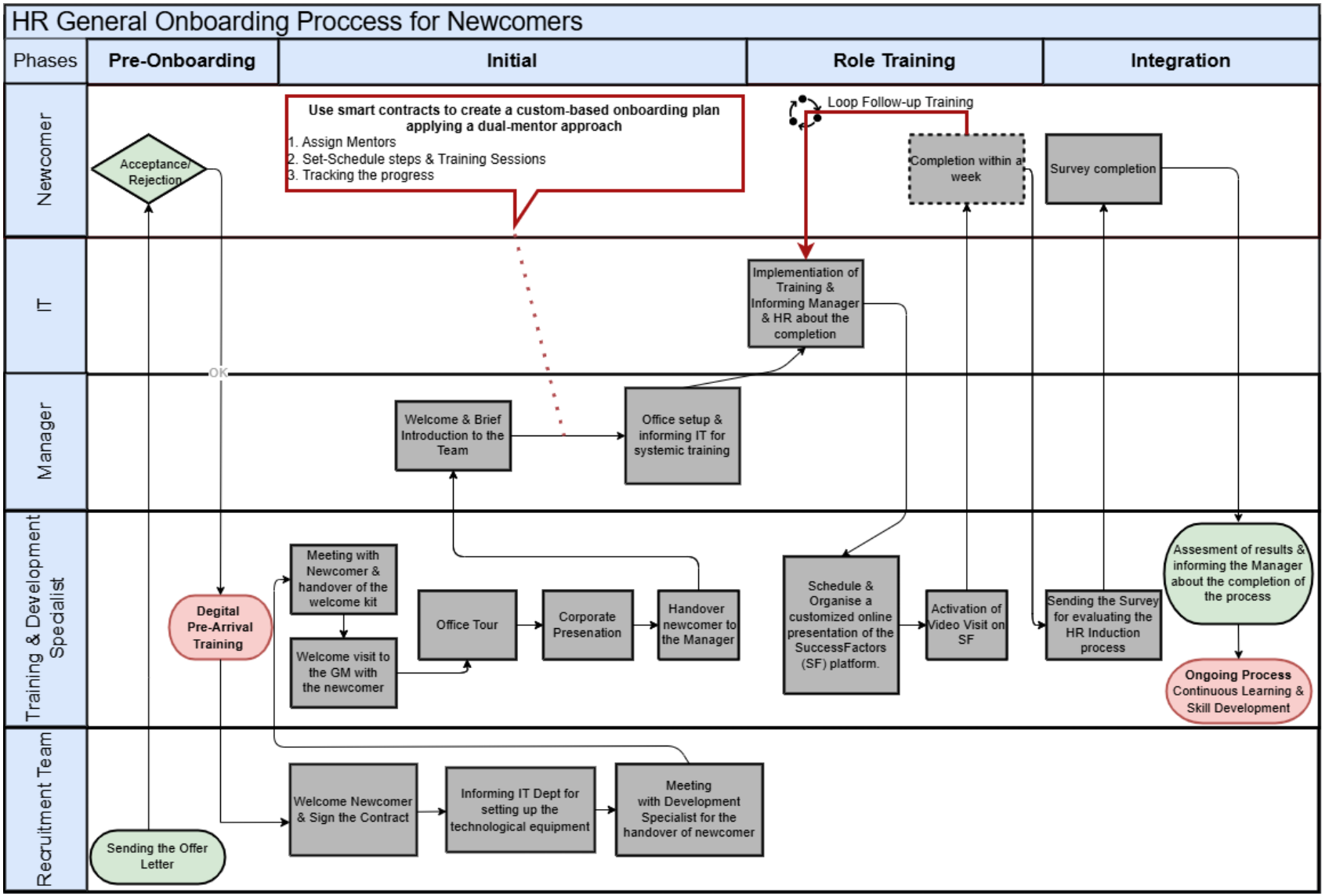


Figure 17: *Suggestions for improvement of current ElvalHalcor strategy*

Appendix B

I. Research Information

Project Title:	The Role of Knowledge Transfer - KT in Enhancing the Onboarding Processes
University:	TU Delft
Faculty:	Civil Engineering & Geosciences (CEG)
Department:	MSc Construction Management and Engineering
Name of Responsible Researcher:	Evangelos Margaritopoulos
Position of Responsible Researcher:	Master Student

II. Research Overview

a) Brief research summary

This research study aims to thoroughly analyse existing knowledge transfer strategies and onboarding processes within the industry, aiming to suggest interventions in onboarding processes enhancing skill maximisation and reducing inefficiencies and miscommunications among new employees. This study intends to offer practical solutions that streamline the integration of newcomers into companies, leveraging effective mentorship and a hybrid work model to boost both employee satisfaction and organizational efficiency. The research will be implemented in collaboration with ElvalHalcor, using them as a case study, where they will provide essential data about their onboarding process and facilitate approximately 12 interviews with their employees. Also, this research will be conducted on an unpaid basis and is not part of an internship. The participants in the interviews will be HR managers, Managers, and newcomers in entry level to gather data from different perspectives increasing the reliability of the study and comparing the different experiences.

b) Details for the Interviews

The total duration of the interview will be 30 minutes.

There are two sets of questions, one tailored for employees and another for managers, presented in the following separate tables. This approach is designed to gather information from different perspectives by pairing managers and employees from the same department, ensuring comprehensive and aligned insights.

c) Sampling

HR Employees: To gain insights into the strategies and practices implemented to facilitate effective onboarding and describe in more detail the existing onboarding process and its recent interventions.

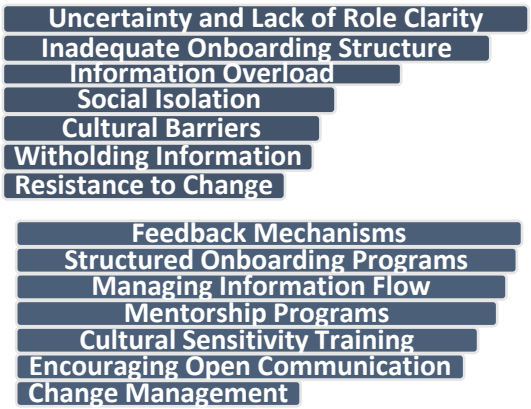
Managers: To assess how well the onboarding process integrates new employees into their teams and aligns with departmental goals. The main goal is to use their expertise to collect reliable data.

Junior Engineers (New Hires): To understand their experiences and challenges during the onboarding process.

Pairing:

Department	Role of the Manager	Before/After Covid-19	Role of New Hired	Before/ After Covid-19
Financial Department	Financial Planning, Controlling & Costing Senior Manager	Before	Financial Analysis Specialist	After
	Financial Planning & Reporting Manager	Before		
Process Engineering Department	Manufacturing & Process Engineering Manager	Before	Technical Specifications Specialist	After
	Production Manager	After		
Warehouse Operations	Warehouse Operations Manager	Before	Order Management Supervisor	Before
Business Department	Business, Industrial Applications & Bi Manager	Before	Area Sales	Before
HR Department	HR Senior Manager	Before	Talent Acquisition Specialist	Before
Total Participants	**12**			

Table 17: *Semi-Structure for the Interview of Employees*

Set of Questions for Interviewing Employees	
Categories of Questions	**Description and Content**
Onboarding Process	Q1: How were you received on your first day and how did the onboarding continue after that? Q2: How did you get introduced to your new position and your role-specific tasks? Q3: What challenges did you face during the onboarding process? Q4: How does a mentorship program influence the onboarding experience? Q5: How long take to absorb them to be productive? Is it possible to make the onboarding online? How long need to have a mentor? Q6: Did they evaluate your onboarding process before the end of your first year and how?
Knowledge Transfer	Q7: What are the key barriers to effective KT during the onboarding process, and how can these barriers be overcome? 
Questions about Expectations vs Reality	Q8: How did your actual onboarding experience compare with your expectations before joining? Were there any resources or support you expected to receive but didn't?
Insights on Processes and Culture & Future Vision	Q9: What would you say works well and less well with your department's current onboarding process and KT? Q10: What improvements would you suggest regarding the onboarding process and knowledge management? Was there something that made you insecure or confused? (e.g.: Lack of Strict Communication, people involved, education, role-specific training, evaluation) Q11: What is the best way to socialise the new employees into the team and the company culture? Q12: Which people do you think should be included in the onboarding process? Do you feel that the manager has the time required to introduce the new employee in a good way?

Set of Questions for Interviewing Employees	
Categories of Questions	**Description and Content**
	Q13: Are there any specific courses (classroom or E-learning), information material, training or practical moments you consider to be useful for a new hire in your department?
End with an Open Invitation for Feedback	Q14: Is there anything else about your onboarding experience that you'd like to share?

Personal Notes:

Introductory Questions

- *Starting with general questions which will include information about the role in the organisation, age, and experience.*

Q1: For how long have you been working at the company?

I. If several departments, which other have you been at?

II. Did you hire before/after/during Covid-19?

III. Do you prefer to work from home or the office? Is this possible and productive?

- Closing with Open questions, allowing for open-ended feedback at the end allows employees to share any additional thoughts or experiences that weren't covered by your questions.

Follow-up for Q1

Q: How did your actual onboarding experience compare with your expectations before joining?

Follow-up Question

Q: What challenges did you face during the onboarding process?

Table 18: *Semi-Structure for the Interview of Managers*

Set of Questions for Interviewing Managers	
Categories of Questions	**Description and Content**
Onboarding Process	Q1: How does the new employee get introduced to their new position and role-specific tasks? Q2: Which people participate in the onboarding process of a new hire at your department, what are the requirements to become a mentor? Q3: How do you work to build relationships between the new employee, co-workers and managers? What is the best way to socialise the new employees into the team and the company culture? Q4: How does the shift to remote work environments impact the onboarding process of new employees and KT? Is there a best proportion of working remotely per week, based on your experience? Q5: How long take to absorb them to be productive? Is it possible to make the onboarding online? How long need to have a mentor?
Knowledge Transfer	Q6: What are the key barriers to effective knowledge Transfer during the onboarding process, and how can these barriers be overcome? **Uncertainty and Lack of Role Clarity** **Inadequate Onboarding Structure** **Information Overload** **Social Isolation** **Cultural Barriers** **Witholding Information** **Resistance to Change** **Feedback Mechanisms** **Structured Onboarding Programs** **Managing Information Flow** **Mentorship Programs** **Cultural Sensitivity Training** **Encouraging Open Communication** **Change Management**
Insights on Processes and Culture	Q7: What would you say works well and less well with your department's current onboarding process and KT? Q8: What competencies do you feel newly hired engineers are lacking today? (e.g. personality traits, integration tactics to the department or company, technical skills) Q9: Do you feel that you need specific training yourself or help to be able to deliver better onboarding? Q10: What suggestions do you have for improving the onboarding process for new hires in your department?
End with an Open Invitation for Feedback	Q11: Is there anything else about your onboarding experience that you'd like to share?

Personal Notes:

Introductory Questions

- *Starting with general questions which will include information about the role in the organisation, age, and experience.*

Q1: For how long have you been working at the company?

I. If several departments, which other have you been at?

II. How would you describe your current role and tasks?

III. Did you hire before/after/during Covid-19?

IV. Do you prefer to work from home or the office?

V. Do you prefer to give to your team the possibility for working from home? Is this possible and productive?

- Closing with Open questions, allowing for open-ended feedback at the end allows employees to share any additional thoughts or experiences that weren't covered by your questions.

Appendix C

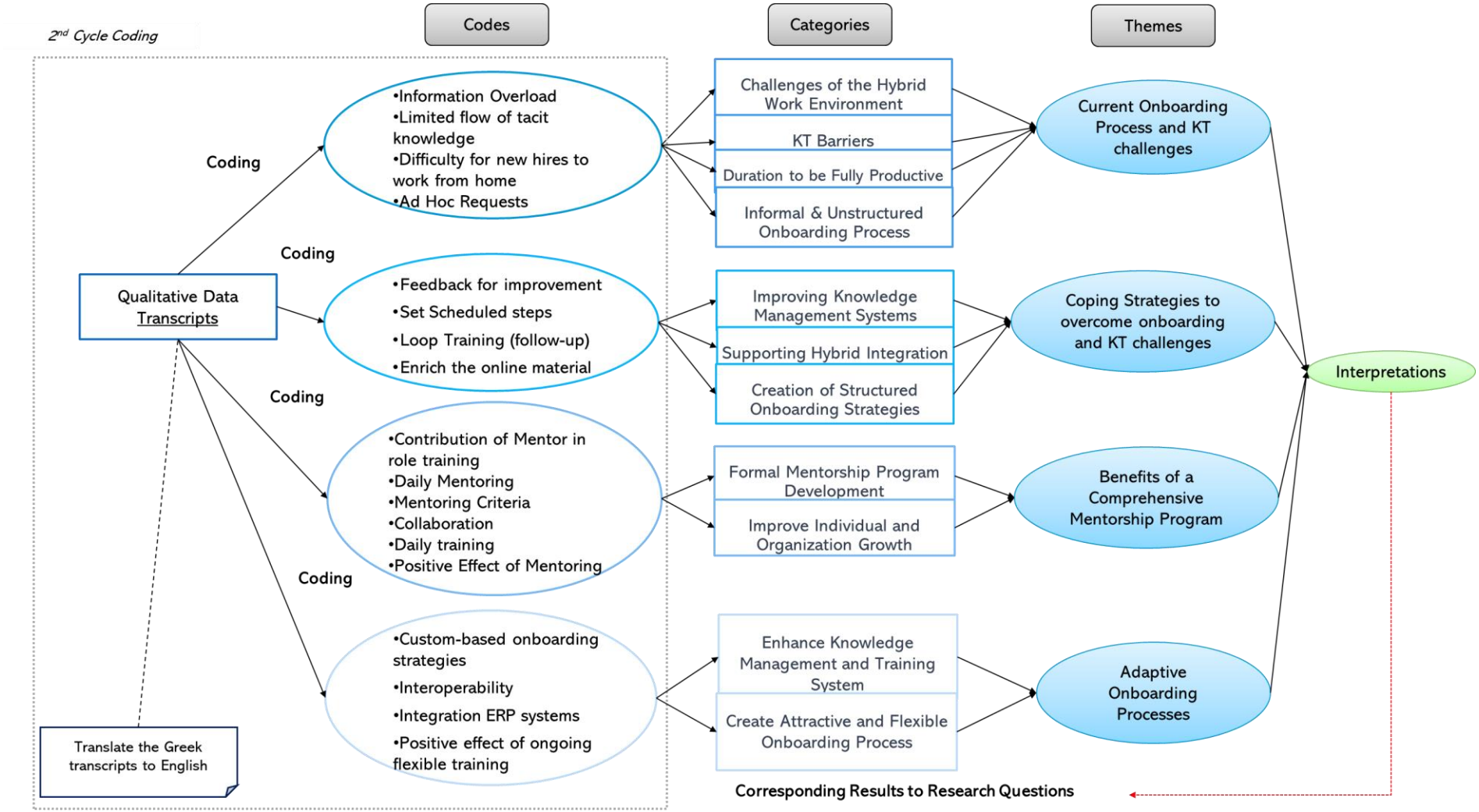


Figure 12: *Overall overview of 2nd cycle of the coding process, presenting the main correlated categories and the four significant themes.*