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Bachelorarbeit

**Empirical Investigation of Pain
Points in the Onboarding Process
at L-Mobile for Software
Developers: Causes and Solutions**

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Abstract

Effective onboarding is critical to employee satisfaction, performance, and retention. This empirical research addresses the pain points faced by new employees during the onboarding process at L-Mobile and aims to identify their causes and propose solutions to minimize the feeling of overwhelm and increase overall satisfaction. Through semi-structured interviews with ten software developers who are currently onboarding or have recently completed the process, qualitative data analysis was conducted to uncover pain points in the onboarding process, focusing on factors that contribute to feelings of overwhelm. The results reveal significant concerns about the lack of satisfactory documentation for the codebase, largely due to the legacy nature of the application. Participants expressed a need for more comprehensive and detailed knowledge resources to support their onboarding, a desire for a shorter, more specific, and targeted onboarding process, and emphasized the importance of training that is aligned with their roles and responsibilities. This study not only presents findings from participant interviews but also integrates suggestions and frameworks from existing research. These findings provide actionable recommendations for L-Mobile to improve the onboarding process by addressing these specific pain points, resulting in increased satisfaction, and reduced feelings of overwhelm.

Kurzfassung

Ein effektives Onboarding ist entscheidend für die Zufriedenheit, Leistung und Erhaltung der Mitarbeiter. Diese empirische Forschungsstudie befasst sich mit den Problempunkten, mit denen neue Mitarbeiter während des Onboarding-Prozesses bei L-Mobile konfrontiert sind, und zielt darauf ab, deren Ursachen zu ermitteln und Lösungen vorzuschlagen, um das Gefühl der Überforderung zu minimieren und die Gesamtzufriedenheit zu erhöhen. Anhand semi-strukturierter Interviews mit zehn Softwareentwicklern, die sich derzeit im Onboarding-Prozess befinden oder diesen kürzlich abgeschlossen haben, wurde eine qualitative Datenanalyse durchgeführt, um die Problempunkte im Onboarding-Prozess aufzudecken, wobei der Schwerpunkt auf Faktoren lag, die zu einem Gefühl der Überforderung beitragen. Die Ergebnisse zeigen, dass das Fehlen einer zufriedenstellenden Dokumentation für den Quellcode Bedenken hervorruft, was größtenteils auf den veralteten Charakter der Codebasis der Anwendung zurückzuführen ist. Die Teilnehmer äußerten den Bedarf an umfassenderen und detaillierteren Wissensressourcen zur Unterstützung ihrer Einarbeitung, den Wunsch nach einem kürzeren, spezifischeren und gezielteren Einarbeitungsprozess und betonten die Bedeutung von Schulungen, die auf ihre Rollen und Verantwortlichkeiten abgestimmt sind. Diese Studie stellt nicht nur die Ergebnisse der Teilnehmerinterviews vor, sondern integriert auch Vorschläge und Modelle aus bestehender Forschung. Diese Ergebnisse bieten L-Mobile umsetzbare Empfehlungen zur Verbesserung des Onboarding-Prozesses, indem diese spezifischen Schmerzpunkte angegangen werden, was zu einer höheren Zufriedenheit und einem geringeren Gefühl der Überforderung führt.

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Acronyms

JD-R Job Demands-Resource. 23

P-E fit Person-Environment fit. 23

1 Introduction

In the competitive corporate landscape, the onboarding process plays a critical role in ensuring employee satisfaction, performance and retention [BE11]. Onboarding is described as a process of helping newly hired employees quickly and seamlessly adapt to their new job position [Bau10].

An effective onboarding process starts from hiring a new employee and ends with their full integration into the workforce. In modern companies, where technological progress and rapidly changing markets demand adaptability and rapid skill acquisition from employees, the onboarding process is becoming even more important. This is especially true for IT and software development companies. Developers are expected to quickly find their way into their role, acquire the necessary knowledge and skills, and work on complex systems. Figure 1.1 shows publications starting from the year 2000, in which the terms “onboarding” or “organizational socialization” were used in the title and abstract. The figure shows the number of publications increasing in recent years, which implies the importance proper onboarding has in today’s world.

However, the reality often differs from this ideal as new employee encounter numerous challenges and pain points during the onboarding process.

This study addresses the dynamics of onboarding, with a specific focus on the perceived pain points and related challenges faced by new employees. It is conducted in the context of L-Mobile, a dynamic IT systems house and software development company known for its innovative solutions and evolving technological landscape. A group of software developers at L-Mobile were interviewed, who were either currently undergoing the onboarding process or had recently completed it. The aim of these interviews was to uncover the problems and challenges faced by new employees on their journey to L-Mobile, as well as to find causes and suggestions for improvement. Understanding these pain points and their underlying causes is essential to facilitating a smoother onboarding process.

One critical aspect that emerges from these pain points is the potential for overwhelmed feelings. New hires may find themselves grappling with various stressors, such as uncertainties and challenges related to organization or the onboarding process. This study aims to shed light on the causes of these pain points and explore potential solutions to minimize overwhelmed feelings and maximize overall satisfaction for the new hire. Furthermore, it examines the effectiveness of these proposed suggestions, drawing on both participant recommendations and existing frameworks from the literature.

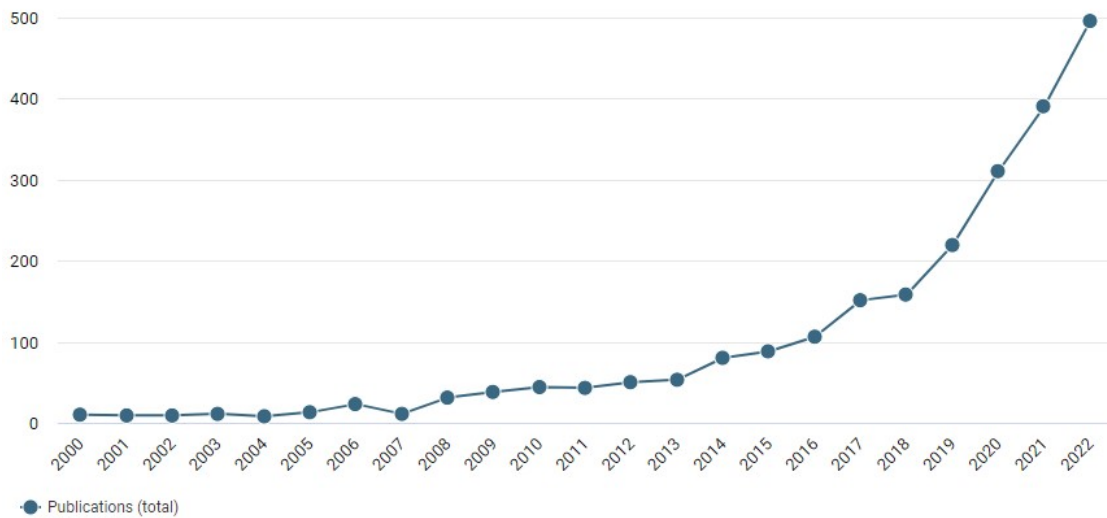


Figure 1.1: Number of publications each year from <https://app.dimensions.ai>

1.1 Research Questions

The main objective of this study is to examine the onboarding process for software developers at L-Mobile and identify the pain points that contribute to a sense of overwhelm, as well as provide answers to our three research questions.

- RQ1: Are there any perceived pain points in the onboarding process that participants are overwhelmed with?
- RQ2: What are the causes of these pain points?
- RQ3: How could the company deal with these pain points to minimize overwhelmed feelings and maximize overall satisfaction with the onboarding process?

By conducting a case study on L-Mobile's onboarding process for software developers, this study aims to contribute to the company's ongoing efforts to enhance the experience for new employees, identify areas for improvement and offer actionable recommendations, while also providing insights that may be applicable to other organizations in the technology industry.

2 Background

2.1 Definitions

Onboarding, also known as organizational socialization, is a process that assists in the integration of new employees into an organization. It is associated with providing support and resources to help newcomers adjust to their roles, become familiar with the organizational culture, and develop the necessary skills and knowledge to perform effectively [Bau10].

Several definitions of onboarding have been provided by literature, each emphasizing different aspects of the process.

According to Bauer [Bau10], onboarding is the process that assists new hires' adjustment to the social and performance aspects of their jobs, helping them learn the attitudes, skills, knowledge, and behaviors required to function effectively. This is supported by Ju et al. [JSKH21], who underscores the role of onboarding in helping new team members adjust to their new roles and surroundings.

Researchers also discussed differences between onboarding and socialization. According to Klein et al. [KPL15], onboarding refers to the *“formal and informal practices, programs, and policies enacted or engaged by an organization or its agents to facilitate newcomer adjustment”*. In contrast, socialization has been described as the process through which individuals learn and adapt to take on a specific role within an organization [Cha12; KPL15].

Some definitions stress quick and smooth adjustment, with the goal being to make new employees feel welcome and prepared for their jobs as quickly as possible [Bau10]. The focus on speed is tied to the understanding that the quicker the newcomer successfully integrates, the sooner they can begin making contributions to the organization [Bau10].

To better analyze the difficulties and challenges associated with onboarding, it is necessary to define the terms related to overwhelmed feelings in this context. According to Hubbard [Hub14], uncertainty can be defined as the lack of certainty, marked by a condition of restricted knowledge, especially about the existing state, an outcome, or result. Stress is experienced by individuals who are uncertain about the outcome of a situation, leading to a sense of lacking control and, according to Peters and McEwen [PM15], originates from these feelings of uncertainty. Overwhelmed is the state of being completely overcome or overpowered by thoughts or feelings [Mer23], especially those related to anxiety, uncertainty, or stress. At its core, the purpose of onboarding is to alleviate the stress and uncertainty that new hires encounter, enabling them to feel more confident about their new organization [BC74; EBM+15].

These varying definitions underscore the complexity and multidimensionality of the onboarding process, highlighting its role in not only helping newcomers adjust to the requirements of their new roles but also facilitating their integration into the social fabric of the organization. Given the importance of this process, it is essential to understand the different factors that can influence its effectiveness, as well as take a closer look at the outcomes to which it can contribute.

2.2 Onboarding outcomes

Effective onboarding is crucial for both the organization and its employees. Research shows that onboarding can lead to a number of positive outcomes when managed properly:

Benefits perceived by companies include improvements in employee retention, general productivity, and customer satisfaction [BBE+07; Lau13]. Research indicates that at the employee level, well-executed onboarding leads to higher job satisfaction, organizational commitment, higher performance and lowered stress [Bau10; BBE+07; CP01; Fis85; MA88; MB01; Sne06; WK00].

Other studies have found that effective onboarding practices can minimize newcomers' anxieties and uncertainties and provide them with the resources they need to become proficient in their roles, which also helps new employees better understand their environment. [CA05; FDS11; KPL15; KW00].

In addition to these benefits, Ju et al. [JSKH21] mentions that some managers want onboarding to foster a sense of independence among employees. It serves as a final checkpoint, ensuring that new employees are prepared to perform their duties in other areas.

Furthermore, improvements around process and technology in onboarding also bring benefits such as reduced HR workload, improved data collection, compliance with legal and policy norms, and cost savings, which can contribute to some degree to positive outcomes for organizations [Sne06].

Unsuccessful onboarding, on the other hand, can lead to employee turnover and inefficiency, resulting in a repetitive and costly hiring cycle for companies [BE11].

2.3 Models of Onboarding

In order to understand the onboarding process, different models have been proposed to provide insights into its key aspects and their impact on newcomers' adjustment. Three notable models that contribute to the understanding of onboarding are Van Maanen and Schein's Model, Jones' Model, and Bauer's Model.

2.3.1 Van Maanen and Schein's Model

Van Maanen and Schein's Model [VS77] suggests a theoretical framework that categorizes onboarding tactics into six dimensions.

The first dimension is collective versus individual onboarding, which refers to whether newcomers go through onboarding activities together as a group or separately as individuals. An example of this would be attending a boot camp together (collective) or completing tasks isolated from other team members (individual).

The second dimension is formal versus informal onboarding. Informal onboarding practices have no clear onboarding plan and new hires can acquire knowledge through observing their colleagues, learning while doing, and conversing with their team members and managers. This method can foster a sense of independence and adaptability. On the other hand, formal onboarding practices involve a structured and well-coordinated onboarding plan. This typically includes activities, tasks and mandatory programs such as orientation sessions, training, and mentoring programs, as well as providing comprehensive onboarding materials detailing job responsibilities and goals. In general, research indicates that organizations that adopt formal onboarding strategies tend to be more effective than organization that adopt informal onboarding [Bau10; BBE+07; CP01]. However, the degree of formality of an onboarding program can vary significantly from company to company or even between different departments within a company.

The third dimension is sequential versus random onboarding, which indicates whether ordered steps are established in the onboarding process for newcomers.

The fourth dimension is fixed versus variable onboarding, depending on whether every step or task of the onboarding process has a specific timetable is assigned to it.

The fifth dimension is serial versus disjunctive onboarding. Serial onboarding occurs when older, more experienced employees act as role models for newcomers, especially when new employees must follow in the footsteps of their predecessors. In contrast, disjunctive onboarding is characterized by the fact that there are no set role models for new employees.

The sixth dimension is investiture versus divestiture onboarding. Investiture onboarding relates to the organization's preference for new hires to maintain and apply their unique qualities, skills, and beliefs. On the other hand, divestiture is about the company's tendency to disregard and eliminate the personal traits of newcomers to align them with organizational expectations.

2.3.2 Jones' Model

Jones' Model [Jon86] offers a unique perspective on onboarding techniques, building on Van Maanen and Schein's initial model. The essence of the model lies in two comprehensive categories: institutionalized and individualized onboarding.

Institutionalized onboarding represents a structured and organized approach. It integrates formal onboarding and comprehensive mentorship programs, offering a clear path for newcomers. This category aligns with the collective, formal, sequential, fixed, serial, and investiture aspects of Van Maanen and Schein's model, underscoring the value of structured approaches.

Individualized onboarding, on the other hand, takes an experience-based learning approach. Here,

new employees are thrust into their roles from day one and must adapt to the company's norms, values, and expectations over the course of their employment. This method resonates with the individual, informal, random, variable, disjunctive, and divestiture aspects of Van Maanen and Schein's model, suggesting an adaptable and flexible learning experience for newcomers.

Research has shown the significant effects of institutionalized onboarding. These tactics positively influence job attitudes, organizational fit, commitment to the organization, job performance, as well as reduce the likelihood of turnover and provide higher job satisfaction than individualized onboarding [BBE+07; Jon86; KH08; SUF07]. However, according to Cable and Parsons [CP01], this advantage seems to be more pronounced among college graduates who start their first job than among workers who change jobs.

In sum, both Van Maanen and Schein's and Jones' models provide invaluable insights into the complexities of onboarding techniques, emphasizing the importance of various dimensions within the onboarding process. These two tactics encourage proactive behavior, which leads to more successful integration of newcomers into the organization as they tend to build social networks within the organization and better understand its culture [GSZ06; Tho05].

2.3.3 Bauer's Model

Finally, Bauer's model [Bau10; BE11] is a comprehensive framework for understanding and optimizing the process of employee onboarding in an organization. Just like the previous two models, Bauer stresses on the benefits of Institutionalized onboarding but takes other important aspects like new hires' characteristics and behavior into account. Research links certain personal traits to quicker adjustment to a new organization [AS96].

This model allows organizations to assess the effectiveness of their current onboarding practices and offers a source of best practices.

Four C's

The "Four C's" is a fundamental construct in Bauer's model, defining the distinct levels of onboarding [Bau10].

The first level, Compliance, involves educating new employees about the organization's legal requirements and policies.

The second level, Clarification, involves ensuring that newcomers fully understand their job roles and the associated expectations.

The third level, Culture, is about giving new employees a feeling for the norms of the company, both formal and informal.

The last level, Connection, is about building important interpersonal relationships and information networks within the organization, which is of utmost importance for the successful integration of newcomers.

Bauer describes that the approach a company takes to its onboarding strategies depends on the extent to which it values each of the "Cs".

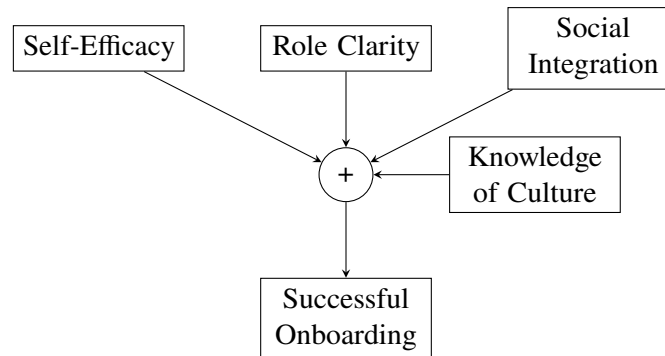


Figure 2.1: Factors contributing to newcomer adjustment, adapted from Bauer [Bau10]

Short-term outcomes

Bauer's model highlights the short- and long-term outcomes that effective onboarding brings. The short-term outcomes primarily focus on how well new employees adjust to their roles, which is reflected in the effectiveness of the onboarding strategy. The adjustment process depends on four crucial variables: self-efficacy, role clarity, social integration, and understanding of organizational culture. Fig. 2.1 shows the four variables of the adjustment process for new employees, leading to successful onboarding.

Self-efficacy refers to new hires' confidence in their ability to successfully perform their job tasks. The concept of self-efficacy is especially significant for newcomers to the job market, such as recent graduates [BBE+07]. Bauer's meta-analysis [BBE+07], as well as Kammeyer-Mueller & Wanbergs Research [KW03] found that self-efficacy is closely correlated to various onboarding outcomes, including organizational commitment, job satisfaction, and turnover.

Role clarity, a clear understanding of one's role and expectations in the organization, is the second key variable of new employee adjustment in Bauer's model. A study from 2010 [10] has shown that the absence of role clarity, which can be referred to as role conflict, can potentially lead to substantial financial losses for businesses and that companies in the United States and the United Kingdom lose about \$37 billion each year due to employees' lack of understanding of their roles. Role clarity is related to positive onboarding outcomes [BBE+07; KW03; SUF07] and even predicts job satisfaction and organizational commitment [Adk95]. Bauer and Green [BG98] discovered that the degree to which managers could articulate expectations influenced these outcomes, especially among fresh graduates.

Social integration, the third important variable for successful onboarding in Bauer's model, is about the acceptance that new employees experience in their social environment at work. According to Fisher [Fis85], 60% of managers who have not achieved successful onboarding attribute this to ineffective interpersonal relationships. Other research also shows that successful social integration of a new employee into a work team is positively associated with job commitment and staff turnover [KW03]. However, it is important that new employees actively and frequently promote their own social integration by, for example, making small talk with colleagues, participating in volunteer events, and trying to strengthen their relationship with their supervisor by taking on new responsibilities and successfully completing tasks. [Bau10].

The fourth and last variable for successful adjustment of new employees focuses on the integration into the organization’s culture. Bauer [Bau10] describes it as “knowledge of, and fit within, an organizational culture”, which includes its policies, goals, values, and unique language. Bauer also emphasizes how important understanding and integrating into the organizational culture as a new hire is, which is supported by the correlation with job commitment, satisfaction, and turnover [COW+94; KW00].

Long-term outcomes

Looking at the long-term outcomes, Bauer focuses on six key elements: Recruitment, orientation, mentors, training, support tools and feedback. Figure 2.2 shows Bauer’s full picture of the onboarding process.

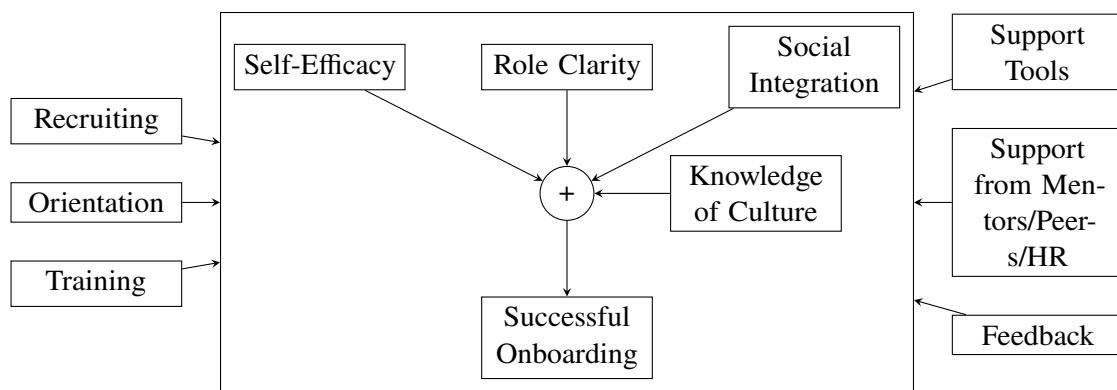


Figure 2.2: Variables contributing to successful onboarding, adapted from Bauer [Bau10]

Although recruitment is often handled independently of onboarding in many organizations, its integration can facilitate new employee adjustment, particularly in terms of self-efficacy, role clarity, and culture [KFP06]. Recruitment should ideally perform two primary functions: providing information and setting realistic expectations for the new hires [Bre09]. An effective recruiting strategy includes the use of Realistic Job Previews, where companies can, for example, create online questionnaires or simulate a work task they would have to perform in their future job. Although these job previews may cause employees to decline the jobs offered, they can lead to a 50 percent decrease in turnover rates in the long run by helping new employees develop realistic expectations and coping strategies. [Bre09; SB86]. Good recruiting filters out those who do not fit well with the organization, enabling companies to avoid the cost and inconvenience of having to replace them shortly after hiring.

The second key element is orientation programs. They are common in most companies and, according to Anderson et al. [ACH96], 93% are conducting some form of in-person or online orientation program. Orientation programs provide a chance for newcomers to better understand the organization’s culture, values, objectives, and hierarchy. Furthermore, these programs provide social benefits by introducing newcomers to their colleagues and other members of the organization [KW00]. Orientation programs provide newcomers with the opportunity to better understand and learn about the organization. In addition, these programs provide social benefits by introducing newcomers to their colleagues and other members of the organization. Orientation is effective in reducing anxiety and stress and typically has a positive impact on various onboarding outcomes such as organizational commitment, met expectations, ability to cope, job satisfaction and intention to

remain in the job [GM66; KW00; Sak94a; SG12]. Some companies started using computer-based/e-learning orientations, which offer the advantage of consistent program delivery across different locations. However, according to a study by Wesson and Gogus [WG05], these digital methods may have certain drawbacks, and they might be most beneficial when complemented with conventional methods.

The third key element is the support of mentors or peers who provide advice and help the new employee properly understand work instructions, and often become a reliable source of information for questions that new employees may be hesitant to ask their supervisors [Bau10]. Mentors, in addition to co-workers and supervisors, have proven to be extremely useful sources of information and social support for new employees, complementing formal training and orientation programs [AEL06; Fel89; LPP83]. Empirical research by Ostroff and Kozlowski [OK93] has established that mentorship significantly improves a new hire's knowledge about their organization, as compared to those without mentors. Still, it is important to consider how mentoring can impact a mentor's own productivity. It might slow them down temporarily. However, this short-term decrease in productivity could be worthwhile because it could lead to long-term benefits, such as higher general productivity and innovation new hires can bring [FGBM14]. Meanwhile, information acquisition from mentors, senior co-workers, and supervisors contributes significantly to successful onboarding outcomes such as great job satisfaction, positive organizational commitment, and reduced turnover and stress [LPP83; OK92].

The fourth key element is training, which plays a crucial role in the onboarding process. Training can significantly boost the factors contributing to the newcomer adjustment [Bau10]. According to Saks, training is positively related to job performance, satisfaction, and commitment, as well as lowering anxiety and turnover rate, especially for those with low self-efficacy levels at the start [Sak95; Sak96]. During training, new employees can learn the expected behaviors and norms and develop a positive attitude toward the job and the company [Fel89; LPP83]. The amount of training and its utility correlate with positive onboarding outcomes that influence the newcomer adjustment [Sak96]. In terms of practical training methods, strategies like 'boot camps' can be effective. This means that new employees are divided into groups according to their skills and have to undergo practical training together. This helps them improve their skills and gain a sense of fulfillment as they contribute to important projects for the company [PKSS17]. Another approach is pair programming, where two developers work together on one workstation. This approach has gained popularity and is recognized as an effective training technique [PKSS17].

The fifth key element describes the support tools and processes Bauer [Bau10] sees as the ones contributing the most to successful onboarding: The first is a written onboarding plan, which outlines a newcomer's timeline, objectives, responsibilities, and available support. It serves as a structured roadmap for their integration into the organization; The second are stakeholder meetings which involve all relevant stakeholders in the onboarding process to provide newcomers with essential information and opportunities to ask questions; The third category involves online onboarding programs, particularly those that integrate elements of both online and traditional onboarding. These hybrid systems offer advantages from both approaches while providing supervisors with a clear overview of new hires' progress.

The last key element is feedback. Effective onboarding goes beyond the initial orientation phase; New employees need feedback to settle into their roles, understand their colleagues' reactions, and identify goals for improvement. Different companies use various approaches to collect employee feedback, two examples are [Bau10]: Performance appraisals, also known as performance reviews

or evaluations, are systematic processes used by organizations to evaluate the job performance of their employees. One such process could be 360-degree feedbacks, that offer valuable insights by gathering input from colleagues and supervisors and provides employees with information about how they are perceived by others. While passive methods like observing the environment, behavior of colleagues and reading company materials help, proactive methods like engaging in conversations and asking for feedback are crucial for understanding company culture and norms.

2.4 Stress during Onboarding

In a rapidly evolving world, where companies have to quickly adapt to new technologies and changing market dynamics, up-to-date organizational onboarding strategies are crucial for a successful workforce. The Bureau of Labor Statistics [Lab21] estimates that the average baby boomer changes jobs 12 times during their working life, which is expected to get even higher [EBM+15]. In the United States alone, more than 25 percent of employees change jobs each year, resulting in high turnover rates. [RPC05]. According to research from Smart [Sma05] and Krauss [Kra10], half of the senior external hires and hourly workers leave their new positions within a short period.

High turnover rates aren't solely a result of job related stress. However, research shows that work-related stress can lead to poorer employee physical and mental health and performance, which increases turnover [GC11]. The onboarding process in particular can often be associated with significant work stress and excessive demands for new employees [And01; EBM+15; PKSS17; SG12], due to the uncertainties associated with starting a new job. Other research has shown that excessive job demands can lead to burnout and health issues and thus represent further barriers to the adaptation process of the newcomer [BD07; SG12].

According to the Uncertainty Reduction Theory by Berger and Calabrese [BC74], organizational socialization (or onboarding) acts as a tool to decrease these uncertainties and thereby lessen stress, by providing information to new hires and aiding their learning process [EBM+15; KH08; PMF17; WKLL15]. Research has shown that especially the social support provided by supervisors, mentors, and peers can significantly decrease stress [Hal06], predict or decrease burnout [TL09; VSF99] and reduce work-family conflict and role stress [NCL01]. Yet, new employees may still hold back from asking questions to avoid burdening their mentors or even fear of appearing incompetent in front of peers or supervisors, enabling their stress and uncertainty.

Onboarding can also be emotionally challenging. There is often a pressure to shape one's personality to fit the organizational identity, which can induce feelings of unease and emotional drain [Gra03].

Another big stressor is the lack of role clarity (role ambiguity) and job expectations, which can be a burden during the onboarding process and, according to LePine et al. [LPL05], often lead to higher stress levels. A meta-analysis by Örtqvist and Wincent [ÖW06] found a negative correlation between role ambiguity and personal success as well as job satisfaction and organizational commitment. Simultaneously, role ambiguity correlated positively with anxiety, emotional burnout, depersonalization, intention to leave the job, and physical stress symptoms [EBM+15; FG83; NMB+11; ÖW06]. Therefore, establishing clear roles can ease the stress-inducing effects of onboarding or high job demands.

Certain sectors, such as software development, are particularly vulnerable to these issues. Here, developers can face stress when working on a new system with a new framework and social challenges as they fit into a new development team. This stress can affect their happiness, retention, and productivity, highlighting the need for improved onboarding strategies [JSKH21].

In companies like L-Mobile, where development teams are globally distributed and developers work on ongoing product development, onboarding can be even more complex and draining to the new hire. Furthermore, legacy projects often require extended mentoring due to the difficulty of connecting with the original developers, which can place a burden on mentors and slow down the onboarding process [BCSS18]. Studies also imply that onboarding developers globally often require remote onboarding sessions which can postpone productivity at work [SCTG16; SSGR15].

Strategies/ Frameworks

Companies can use different strategies or frameworks to improve onboarding [EBM+15]. Saks [Sak94b] for instance, discovered that formal training was associated with decreased stress levels among newcomers with low self-efficacy, while informal training could potentially increase anxiety among such individuals.

One concept describes the Person-Environment fit (P-E fit) or Person-Organization fit [Kri96], in which a mismatch between an employee and the organization can lead to increased stress levels, while a “fit” leads to improved well-being [FCV82]. Several meta-analyses have demonstrated a positive correlation between P-E fit and positive onboarding outcomes, including job satisfaction, organizational commitment, and retention [KZJ05; SUF07; VBW03].

In terms of onboarding, the Job Demands-Resource (JD-R) model offers further insights. Bakker and Demerouti describe work resources as all types of assets that contribute to goal achievement, reduce job demands, and/or promote personal development. On the other hand, job demands are aspects that require physical and/or mental effort or skill. The JD-R model thus suggests that resource availability can influence employees’ reactions to demands, which can be especially relevant during the onboarding process, since it can be seen as a time of high job demands [BD07].

A different perspective comes from LePine and Podsakoff as the challenge-hindrancer stressor framework [LPL05; PLL07], which categorizes stressors into two types. Hindrance stressors only result in negative outcomes, while challenge stressors can result in both negative and positive outcomes, such as goal achievement and positive well-being. While both can lead to stress, employees often respond with increased effort to challenge stressors, making them feel proud of overcoming a challenge. Role ambiguity or excessive bureaucracy, for instance, can be seen as obstacles that hinder progress. In such cases, new employees tend to react by avoiding or withdrawing from the situation, as they perceive these hurdles as overwhelming [LPL05]. Meta-analysis supports these findings, linking hindrance stressors to decreased job satisfaction and organizational commitment, as well as increased turnover [PLL07].

2 Background

Lastly, the transactional model of stress highlights the role of individual interpretations of stressors [EBM+15; LF84]. According to this model, stress is the result of a constant interaction between a person and his or her environment. When a person is confronted with a stressor, such as a new and unfamiliar work environment, task or responsibility, he or she engages in an appraisal process. During this process, the person evaluates the extent to which the stressor poses a threat to his or her goals or well-being. This influences the choice of coping strategies and ultimately guides the response to the stressful situation. Coping efforts may include actions such as seeking more information, acquiring additional skills, or seeking support from others.

3 Method

This section describes the overall research design and methodology of this study. The primary objective is to identify empirical concepts related to pain points in the onboarding process at L-Mobile, particularly those that lead to feelings of being overwhelmed among software developers. Additionally, it aims to uncover the causes of these pain points and gather suggestions to enhance overall satisfaction during the onboarding experience. To achieve these goals, a case study was conducted, utilizing a qualitative semi-structured interview approach.

3.1 Subjects & Research Site

The study focused on software engineers and developers employed at L-Mobile who were either in the onboarding process or had completed the onboarding process within the last 12 months prior to the interviews. The choice of these subjects was essential to gain insights into the experiences and accounts of individuals at various stages of onboarding within the organization.

To ensure a comprehensive perspective, ten subjects were interviewed respectively. The distribution of interviewees by location was as follows: one interviewee from Germany, one from Hungary, one from Spain, and seven from Tunisia. The subjects also represented a broad spectrum of prior experience levels in the field of software development, ranging from less than one year to a maximum of 20 years. This diverse range of experience levels allowed us to capture a variety of perspectives, from those new to the industry to seasoned professionals.

L-Mobile, the research site for this study, is an IT system house that specializes in offering a wide range of IT solutions. These solutions encompass network and server solutions, IT security, digitalization services, and a diverse portfolio of business-to-business software solutions, supporting functions such as accounting, office productivity, customer relationship management (CRM), and other essential work-related activities. L-Mobile is a substantial organization with an employee base ranging from 250 to 300 individuals. Among its employees, a significant proportion, around 80 individuals, are dedicated software developers. While L-Mobile is headquartered in Germany, it maintains a global presence with subsidiary locations in Switzerland, Spain, Hungary, and Tunisia. These international branches serve as crucial hubs for the delivery of IT solutions and software development services. Notably, most software developers within the organization are based in Tunisia, highlighting the importance of this location in our research.

In adherence to ethical research standards, all participants were informed of the research objectives and provided informed consent. They were also apprised of how their data would be handled, including the recording and subsequent transcription of interviews. As specified in the consent form A, interview recordings and transcripts will be securely deleted upon the completion of the research project to safeguard participant privacy and confidentiality.

3.2 Interviews

The research adopted a qualitative semi-structured interview format. The aim of these interviews was to delve deep into the experiences and perceptions of software developers regarding the onboarding process at L-Mobile. This approach was chosen to allow for flexibility in the conversation while ensuring that key topics and research objectives were consistently addressed.

The interviews were structured around open-ended questions, providing participants with the freedom to express their thoughts and experiences openly.

Each interview session was estimated to last approximately 20 to 30 minutes. This time frame was chosen to strike a balance between gathering substantial data and respecting the participants' time constraints.

The interview questions were organized into distinct topics to systematically address the research questions of this thesis:

The initial segment of the interview comprised a brief set of questions to collect basic demographic information about the participants. The next section aimed at understanding the participant's role at L-Mobile, whether they were undergoing onboarding for the first time, and their general background. To gain a clear understanding of what "overwhelmed feelings" meant to the participants in the context of onboarding, one specific question was dedicated to this topic. The core of the interview consisted of eight to ten questions related to the onboarding process, including the interviewee's experiences, challenges, and opinions regarding it. Approximately four questions were dedicated to exploring the interviewee's interactions and experiences when working with colleagues during the onboarding process. To identify specific pain points within the onboarding process, a series of questions (around three questions for each identified pain point) were prepared to probe deeper into the root causes. Lastly, two to three questions were designed to elicit the interviewee's opinions on potential changes or improvements to the onboarding process.

This format allowed for adaptation during the interview process, ensuring participants' unique perspectives and experiences were effectively captured. The questions were carefully crafted to align with the main research objectives, facilitating a comprehensive investigation into the identified research questions.

3.3 Administration

A brief introduction of the study was sent to L-Mobile via email, and they expressed a strong interest in participating. Project leaders at L-Mobile provided us with contact information for eligible software developers.

The email that contains study purpose, interview process, and shared consent forms for their approval was sent to potential participants. Interview scheduling was coordinated through email and the interviews were conducted over Zoom with audio recording. Prior to recording, participants were informed of data protection and privacy measures. This ensured their understanding and consent regarding data handling for research purposes.

3.4 Analysis

The analysis phase of this research project involved a systematic and structured approach to derive meaningful insights from the interview data.

The verbatim transcription of interview recordings was carried out by using the open-source OpenAI Whisper software. After transcription, the transcript of meaningless phrases has been cleaned out, which could not be categorized or did not contribute to the research objectives.

To analyze the qualitative data, a content analysis approach based on Mayring’s Qualitative Content Analysis [May+04; May14] was applied. This method is well-suited for systematically evaluating textual data and identifying patterns and themes. The coding process involved the creation of main categories, subcategories, and demographic categories. These categories were designed to correspond to the research questions and provide a structured framework for analysis. In Addition, a comprehensive coding guideline (see Table 3.1) was developed, outlining the definitions of each category, anchor examples, and clear coding rules. This guideline served as a reference throughout the coding process. The coding process commenced from the beginning of the transcripts and underwent multiple revisions of the coding guideline to ensure consistency and accuracy.

In addition to the coding process, a dedicated step was taken to extract pain points from within the data from the main categories. This process involved breaking down the main categories into individual pain points and isolating them for further examination. This approach assisted in facilitating a comprehensive understanding of the issues software developers faced during onboarding. Table 3.2 shows examples of how that extraction was performed.

Table 3.1: Coding Guideline

Category	Definition	Anchor Example	Coding Rule
Main Categories			
Pain points	Pain points in the onboarding process and instances where participants mentioned challenges or difficulties encountered during onboarding.	“I found it challenging to understand our documentation during onboarding.”	Code any expressions of difficulties or challenges faced by participants in the onboarding process.
Can these pain points be overwhelming?	Identification of whether the pain points mentioned by participants had the potential to lead to feelings of being overwhelmed.	“The workload and lack of guidance during onboarding were overwhelming.”	Code if participants explicitly discuss overwhelm or stress due to identified pain points.
Causes of pain points	Determining the factors or reasons behind the pain points experienced by participants.	“A lack of clear documentation is the developer’s fault.”	Code any explanations or reasons given by participants for the pain points they encountered.
Continued on next page			

Table 3.1 – continued from previous page

Category	Definition	Anchor Example	Coding Rule
Solutions to minimize overwhelmed feelings and increase satisfaction	Exploration of potential solutions and strategies to mitigate overwhelmed feelings and improve satisfaction during onboarding.	“Having a mentor assigned to newcomers could be a great solution to reduce overwhelmed feelings.”	Code any suggestions or recommendations provided by participants to improve the onboarding process.
Sub Categories			
Onboarding experience	Insights into the overall experience of participants during the onboarding process.	“In the first week of Onboarding, we learned about the company.”	Code any descriptions or evaluations of the overall onboarding experience and the structure.
Success of the onboarding process	Evaluation of the effectiveness of the onboarding process in achieving its intended outcomes.	“The onboarding process really prepared me for my role; it was successful.”	Code any statements assessing the success or effectiveness of onboarding.
The role of the team in the onboarding experience	Examination of the impact of team dynamics and interactions on the onboarding experience.	“The team’s support played a crucial role in making my onboarding smooth.”	Code references to how the team influenced the onboarding experience.
Perceptions of the length	Exploration of participants’ perceptions regarding the duration of the onboarding process.	“I felt that the onboarding process was a bit too lengthy.”	Code any comments or opinions related to the length of onboarding.
Demographic Categories			
Length of their onboarding	Capture the duration of participants’ onboarding experiences.	“My onboarding lasted for about two months.”	Code the duration of onboarding mentioned by participants.
Job Description	Information about the specific roles and responsibilities of the participants at L-Mobile.	“I work as a front-end developer at L-Mobile.”	Code participants’ job descriptions or roles.
Experience in software development and details regarding participants	Experience levels in the field of software development.	“I have been working in software development for five years.”	Code the years of experience or any relevant information about their software development background.

Table 3.2: Examples of pain point extraction from responses

Response fragment	Pain point
“I don’t want to use century old frameworks.”	Difficulties with Legacy Code
“If we want information, we don’t find anything. There is no code documentation.”	Lack of documentation
“Some onboarding articles don’t contain enough details.”	Undetailed Knowledge Resources
“The knowledge that you need, to do all the steps, is a wide range of many different things. This may cause some problems for some people because not everyone is knowledgeable in all the required areas.”	Broad Knowledge Expectation
“We were fatigued because the training took too long”	Length of Onboarding Process
“The transition to Plugin is like a jump into cold water”	Onboarding Advancement
“It’s stressful (to ask too many questions) because all the other workers have issues and have a planning time and have tasks to do.”	Overreliance on Others
“Part of it was boring. The training wasn’t specific for my team”	Unsatisfactory Content

4 Results

In this section, results of the study are presented, which are derived from the analysis of data gathered from the coding process. The results are organized to provide insights into the demographics of our participants, followed by subcategories and an overview of the key findings related to pain points during the onboarding process at L-Mobile.

4.1 Demographic categories

To better understand the context of the findings, the demographic results are presented first.

The participant pool featured a diverse group of participants, comprising 6 male and 4 female employees who are actively engaged in software development, as illustrated in Fig. 4.1. This gender distribution illustrates the inclusivity and diversity within our participant pool.

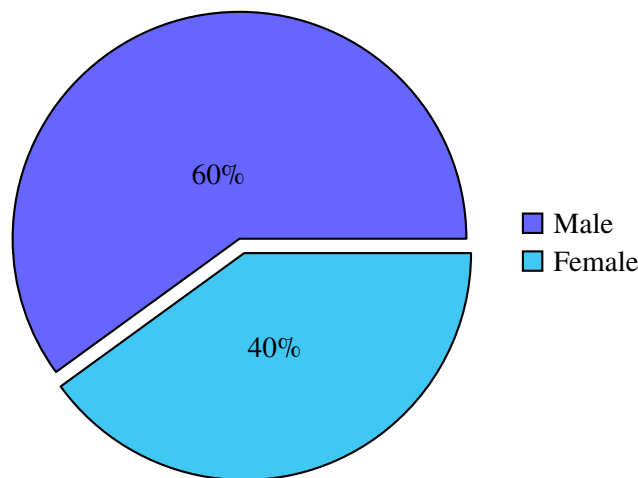


Figure 4.1: Gender Distribution of Participants

The Job descriptions of participants have different roles, as shown in Fig. 4.2. The variety of roles encompassed by the participants reflects the multifaceted nature of software development at L-Mobile.

Table 4.1 provides information about the range, median, and mean of participants' experience in the field of software development, as well as the length of their onboarding. Participants' experience in software development varies from 6 months to 20 years, with the median of 1.5 years. This means

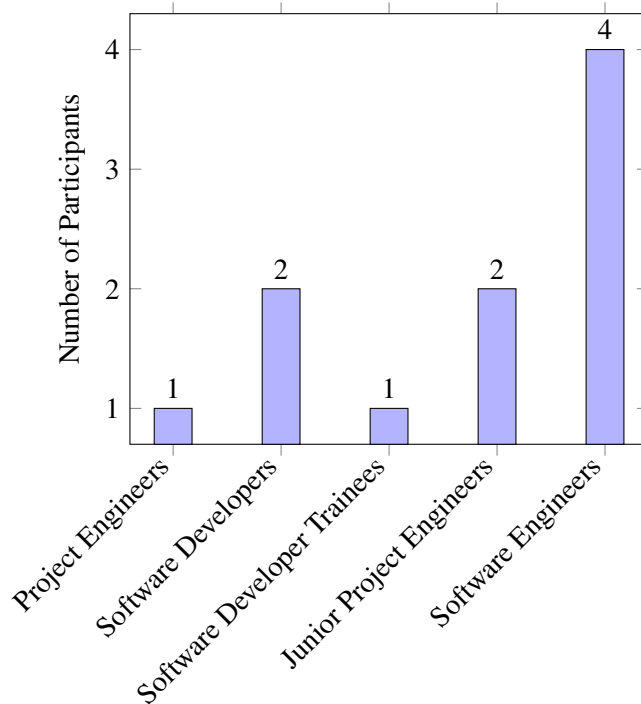


Figure 4.2: Distribution of Job Roles Among Participants

that half of the participants have less than 1.5 years of experience, while the other half have more experience. Notably, the most seasoned interviewee boasts two decades of experience, contributing to an average experience duration of 6 years.

Concerning the length of the onboarding process, participants reported a range spanning from 1 to 6 months. Both the median and mean duration were 3 months, implying that the majority of participants underwent a 3-month onboarding process.

Table 4.1: Participant Demographics

Category	Range	Median	Mean
Experience in Software Development	6 months - 20 years	1.5 years	6 years
Length of Onboarding	1 month - 6 months	3 months	3 months

These findings show the diversity of the participant pool, which reflects various levels of experience and job roles within the software development at L-Mobile. This diversity enriches the analysis by capturing a broad spectrum of perspectives and experiences related to the onboarding process.

4.2 Sub categories

In this section, the specific aspects of the onboarding experiences are illustrated in different sub categories.

Fig. 4.3 communicates the distribution of perceived success among the participants.

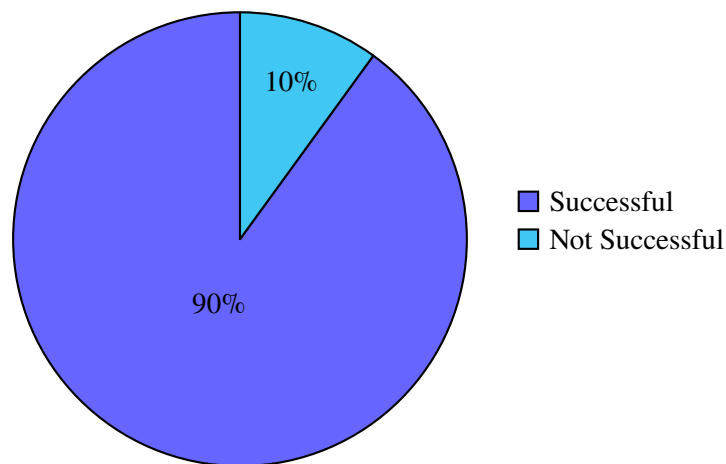


Figure 4.3: Perceived Success in Onboarding

In this case, nearly all (90%) of the participants considered their onboarding experience to be successful, while only 10% did not perceive their onboarding as successful (Fig. 4.3).

During the interviews, participants were asked about their perception of the onboarding length, and their responses provided valuable insights. Half of the participants indicated that they perceived the onboarding process as “too long.” The remaining 50% of participants were satisfied with the length of their onboarding. Some even emphasized the necessity of the time allocated, suggesting that it was essential for them to acquire the knowledge and skills required for their roles effectively. A few participants indicated that an even longer onboarding duration might be beneficial. Figure 4.4 marks all participants who perceived the onboarding as “too long” in red, while those who were content with the duration are represented in blue. The figure clearly illustrates a notable pattern: Participants who perceived the onboarding as “too long” are precisely those who experienced longer onboarding duration.

One notable and consistent theme that emerged from the interviews was the role that the team played in the onboarding experiences of all ten participants. The shared sentiment among participants was overwhelmingly positive when discussing the influence of their peers, onboarding buddies and the team environment. Without exception, all ten participants expressed highly favorable views about their colleagues and the team dynamics during the onboarding process. They consistently emphasized the collaborative and supportive nature of their teams.

“You have your onboarding buddy in L-Mobile, they are very, very helpful. You have your colleagues, you can ask them anything. You have your boss, you can ask him anything. [...] There are many people around you in L-Mobile, that are willing to help you. Everyone helps each other.”

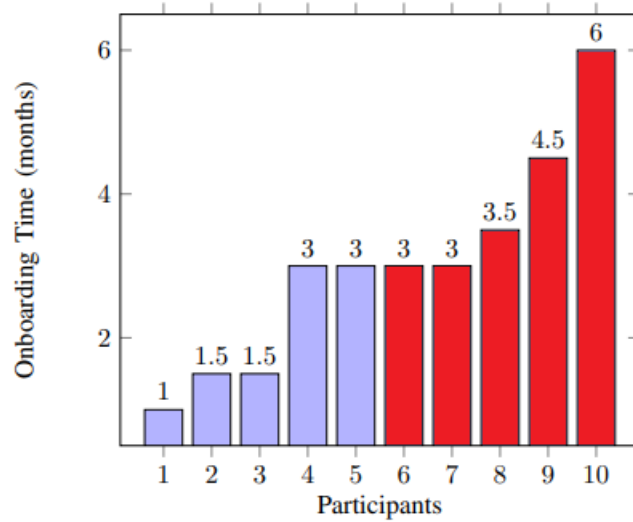


Figure 4.4: Onboarding duration for all participants vs. perception of the length: red = too long, blue = onboarding duration acceptable

They cited instances where they felt comfortable asking questions, seeking guidance, and requesting assistance from their team members.

“Asking questions to others is not a problem here.”

“I have the best team here. [...] You can always talk to your colleagues. We are a team. We help each other [...]”

Participants praised the team environment at L-Mobile and highlighted the absence of barriers when it came to seeking help or clarifications from colleagues.

The results of the onboarding experiences shared by participants in the interviews serve as the basis for the discussion in section 5.

In general, the interviewees described onboarding somewhat differently across the various sites: At the European sites, new hires spend several days acquainting themselves with the overall application they will be working on in the future. This period primarily focused on understanding the application from a user’s perspective. Additionally, participants learned about the company’s culture and values, establishing an understanding of their new work environment. Afterward, participants received basic programming training, which serves as a fundamental building block for their subsequent tasks. This includes essential technologies such as HTML, JavaScript, and CSS, where they have the opportunity to create their own single-page applications, allowing them to familiarize themselves with the primary frameworks employed in the organization’s development projects.

Participants worked on back-end development tasks, including APIs, API calls, working with databases, as well as integration of the frontend and backend components. This phase also covers the mastery of essential mappings and tools utilized within the company’s applications. It should be noted that trainees and project engineers may differ in the amount of programming training they receive, allowing for adaptation to their specific needs and skill levels.

The next phase was centered on customization and specialization: The new hire was tasked with creating a customer plugin for the application. This represents a significant step towards practical application and specialization within the organization's development projects.

In Tunisia, on the other hand, it seemed that more attention was placed on video-based learning and documentation during the first month. The second month concentrated more on practical training, where participants actively engage in application development. Furthermore, the team leader adapts the training to the specific needs and composition of the team. Subsequently, assignments are allocated to team members, contributing to their active involvement in real-world development projects.

4.3 Main categories

The results of the main categories and key findings of this research present a comprehensive analysis of pain points in the onboarding process and the associated causes and solutions, providing valuable insights that address the Research Questions of this research. All extracted pain points are listed in Table 4.2, along with a brief description of each pain point and the occurrence of the mentioned pain point among all interviewees. The pain points describe various challenges or difficulties that the participants have encountered during the onboarding process at L-Mobile. Among these, **lack of documentation** emerged as the most frequently mentioned challenge, cited by total of five participants. Additionally, **length of onboarding** was highlighted by participants on three occasions. The remaining pain points were each mentioned one to two times.

The descriptions of the pain points came directly from what the interviewees shared. To create these descriptions, the important details were collected and combined with insights of participants for each pain point, making sure they formed clear and complete explanations.

Given the importance of these identified pain points, it is essential to take a deeper look into each one of them to gain a comprehensive understanding of their causes and potential solutions.

Table 4.3 summarizes the key findings from the interviews. The table lists different pain points experienced by participants during the onboarding process. For each pain point, it indicates whether it can lead to overwhelm or not, along with the count of participants who expressed feeling overwhelmed in relation to that specific pain point. For example, "yes, 2/2" indicates that out of the two participants who mentioned this pain point, both confirmed ("yes") when asked whether these factors could potentially lead to a new hire feeling overwhelmed. In Addition, the table provides insights into the presumed causes of each pain point, highlighting the factors contributing to the identified issues. The "suggestions" column offers recommendations and potential solutions for addressing the identified pain points. These suggestions aim to reduce overwhelm and improve the onboarding experience.

The next segment will further analyze each of the pain points raised by participants to explore their underlying causes and proposed solutions.

Difficulties with Legacy Code, a pain point mentioned twice among the participants, is generally characterized as the difficulty in dealing with existing software or applications that are outdated or no longer actively maintained. The presence of legacy code as a pain point is not surprising, since older or obsolete code bases tend to lack adequate documentation. This shortcoming can be attributed

Table 4.2: Pain Points in Onboarding

Pain Point	Description	Occurrence
Difficulties with Legacy Code	Difficulty in dealing with existing software or applications that are outdated or no longer actively maintained	2
Lack of Documentation	Absence of clear and comprehensive explanations within the software code-bases	5
Undetailed Knowledge Resources	Knowledge resources, articles, guides, manuals, or reference materials that provide essential information about the organization's processes, systems, and practices lack depth and clarity	2
Broad Knowledge Expectations	New employees are required to possess a broad spectrum of skills or expertise	1
Length of Onboarding Process	Duration it takes for new employees to become fully integrated into L-Mobile and proficient in their roles	3
Difficulties in the Onboarding Advancement	Problems with the flow, order and structure of the onboarding process	1
Overreliance on Others	Too frequent use of support, guidance, or clarification from colleagues or managers	2
Unsatisfactory Content	Unsatisfactory quality and relevance of onboarding content	2

to a number of factors, such as the historical context of the software, changes in development teams, or simply the passage of time. Legacy code can lead to overwhelming experiences for new employees, as confirmed by both participants who cited this as a pain point, as dealing with outdated frameworks and adapting to mature projects can make the onboarding process daunting and confusing for new employees.

As for the cause of using legacy software, one participant explained, *"You have to work on software that uses many different things."* This suggests that legacy software may still be in use because it fulfills specific functional requirements or integrates with a variety of technologies and components, even if it poses challenges for new developers.

However, when asked about suggestions to address this pain point, participants expressed a sense of realism. One interviewee mentioned, *"I guess the company would have to make a really big change for that. It's basically rewriting the whole thing essentially."* However, participants also acknowledged that such a massive overhaul may not be realistic in the immediate future, adding, *"Kind of not that realistic anytime soon, I think."* This indicates that while participants recognize the difficulties associated with legacy code, they understand the practical limitations of implementing a complete overhaul and suggest that alternative strategies may be needed to navigate this challenge effectively.

Among the pain points reported by participants, **Lack of Documentation** stood out as the most dominant problem. This pain point was mentioned by five participants, making it the most commonly cited issue. It is generally described as the absence of clear and comprehensive explanations within the software codebase. Regarding its potential to cause overwhelm for new hires, 4 out of 5 participants acknowledged that it could contribute to feelings of overwhelm during the onboarding process. Participants explained that the lack of documentation made *“the onboarding in some ways, painful.”*, as well as higher the risk of errors (*“[...] a client error, which you cannot really understand because it makes no sense, or it’s coming from a totally different part.”*) and overall uncertainty (*“it can be stressful and make you feel unsure when you don’t know where to find something.”*) among the participants.

Participants identified several causes contributing to this lack of documentation: Legacy code often lacks comprehensive documentation, or as one participant described: *“legacy code/ old frameworks go hand in hand with the lack of documentation.”* This characteristic was supported by the statement that *“after a while, it (the software) will become outdated or obsolete”*. Additionally, the dynamic nature and size of the software, (*“the software is constantly changing.”*; *“[...] usual in a huge project [...] after a while it becomes so huge that everything becomes too complex, and you cannot really avoid this problem.”*), further complicate the maintenance of thorough documentation. Some participants attributed the lack of documentation to human tendencies, that *“people tend to forget or not really like to deal with the documentation or, it is something that they postpone and [...] forget to do it [...]”*, which results in minimal or incomplete records. One participant also noted that *“bad documentation could be sometimes on purpose, sometimes not on purpose”*, possibly as a means to filter or test new hires, or unintentional due to oversight or negligence.

As suggestions for improving the situation, participants emphasized the responsibilities of both developers and management: Some expressed the need for *“increasing the documentation on our part”*, suggesting that developers themselves should proactively contribute to improve and complete documentation. One participant suggested that documentation should be constantly improved over its current state, and also mentioned that more complete documentation *“could be great for at least those parts which are reused by others”*. As for the management, another participants suggested documentation improvements by allocating dedicated documentation time for developers. This might involve setting aside a few hours each month for every developer to focus on documentation tasks, where developers could review and update documentation, identify obsolete sections, and make some revisions.

Undetailed Knowledge Resources as a pain point emerged in the interviews on two occasions. This point is generally described as a lack of depth and clarity in the knowledge resources, articles, guides, manuals, or reference materials that provide essential information about the organization’s processes, systems, and practices. Both participants agreed that it could lead to feelings of overwhelm, with similar reasoning as for the “Lack Of Documentation”, where especially uncertainty regarding the functionality of each model, the process, and the solution was a stressor in the onboarding process. Exploring the underlying causes, the participants described some of the same causes as for the pain point “Lack Of Documentation”, mentioning the dynamic nature of the software as well as that lack of detail may be intentional by the management. One participant additionally added, that developers are dependent on L-Mobile providing this information, because *“it’s not like [...] you can search for (it) in Google.”*

Recommendations included calls for L-Mobile to provide more comprehensive information on the structure and architecture of the application, detailed insights into the functionality of each model, process procedures, and comprehensive explanations of solutions. Furthermore, participants suggested the inclusion of the meaning of components and instructions on how to effectively utilize them within the training materials.

Broad Knowledge Expectations emerged once in the participants' responses. This pain point is characterized by the expectation that new employees are required to possess a broad spectrum of skills or expertise. The participant who mentioned this pain point agreed that this could lead to overwhelm, stating, *"this may cause some problems for some people because not everyone is knowledgeable in all the required areas."*, indicating that high expectations on onboarding developers may cause problems and overwhelm.

When asked about the cause of this pain point, the participant explained, *"most people are supposed to do a wide range of things. For example, there is no definition for backend developers and frontend developers in L-Mobile. All people need to do all tasks."*

No specific suggestions were provided by the participant to address this pain point.

The **Length of Onboarding Process** was mentioned by three participants, indicating its significance for this study. This pain point is generally described as the "Duration it takes for new employees to become fully integrated into L-Mobile and proficient in their roles." All three participants who mentioned the length of the onboarding process as a pain point agreed that it could be overwhelming for new hires. One participant expressed, *"We have fatigue because the training is too long"*, emphasizing the potential challenges associated with lengthy onboarding periods.

Several causes were highlighted, with one participant articulating the dilemma: *"[...] if they make it shorter, then they have to skip some parts."* Additionally, another participant explained the necessity of understanding the application's structure and complexity as essential factors impacting the onboarding duration.

Participants offered valuable suggestions for improving the onboarding process. One participant recommended, *"My suggestion is, [...] I have to do [...] training with all specialists. In a short time, we can do much better [...] in every part. Instead of three months of training, we can do this in one or two months."* indicating that the interviewee wants more specialized training periods. Additionally, they highlighted that shorter onboarding duration would be more effective, ideally ranging from one to two months, as onboarding periods of over 3 months were perceived as too lengthy and potentially monotonous.

Another pain point is the **Difficulties in the Onboarding Advancement**, especially at the transition to the plugin. This pain point is described as problems with the flow, order, and structure of the onboarding process. It was acknowledged by the single participant who mentioned it that this aspect could potentially lead to overwhelmed feelings for new hires. The participant expressed it as *"like a jump into cold water."*

While no specific causes were mentioned for this pain point, the participant was aware of the importance of this step in the onboarding process.

In terms of suggestions provided, the participant expressed a desire for more documentation and guidance, stating: *"I would like some more documentation or would have liked some more guidance on that."*, as well as expressed a need for additional resources, including a view model, views, and

code examples. Additionally, the participant recommended providing “*more examples on how to reuse code and where to find similar code.*” However, it was noted that an excessive focus on this aspect might potentially reduce the overall learning experience for newer developers.

Overreliance on Others is a concern raised by two participants during the interviews, which describes the too frequent use of support, guidance, or clarification from colleagues or managers. It’s worth noting that the frequent availability of support and guidance from colleagues or managers is generally very well received at L-Mobile, and most respondents indicated that asking questions was never a problem. However, one participant highlighted the potential stress associated with asking for assistance too frequently, as it could “*take away time from other team members or the team lead.*” In terms of its potential to cause overwhelmed feelings for new hires, both of the two participants who mentioned this pain point agreed that it could lead to such feelings.

The only cause identified for this pain point was the “*lack of information or documentation.*”

Suggestions for addressing this concern include implementing “*better documentation*” to provide new hires with the resources and information they need, reducing their dependence on constant guidance from peers, mentors or supervisors.

The last pain point mentioned is the **Unsatisfactory Content**, with two mentions during the interviews. This point is described as the unsatisfactory quality and relevance of onboarding content. Neither of the two participants who raised this concern believed that this particular point could lead to overwhelmed feelings. In fact, one of them mentioned, “*some videos took three hours or two hours. It was boring,*” clarifying that while the content might have been tedious, it did not induce stress or overwhelmed feelings.

The causes behind this pain point were attributed to the fact that the training content was not aligned with team-specific needs. One participant stated: “*The training was not specific to my team. Neither the video part nor the application part. [...] It was too vague and not specific enough.*”

Regarding suggestions for improvement, participants highlighted the importance of hands-on coding practice and collaboration. They suggested that actively coding alongside peers, friends, or team leads could boost skills, especially when compared to spending months exclusively watching videos. Furthermore, participants recommended a more personalized approach, suggesting that newcomers that are going “*[...] to be a part of a specific team could take the training for the specific team.*” This personalized approach, they believed, would enhance the training’s relevance and effectiveness.

Table 4.3: Interview data of pain points

Pain Point	Can lead to overwhelm	Presumed causes	Suggestions
Difficulties with Legacy Code	yes, 2/2	<ul style="list-style-type: none"> • Developers are tasked with working on software systems that encompass a wide range of components and functionalities 	<ul style="list-style-type: none"> • L-Mobile would need to make a major change, essentially rewriting everything
Lack Of Documentation	yes, 4/5	<ul style="list-style-type: none"> • Software is constantly changing • May be intentional, to filter or test new hires or unintentional in some cases • Project age and size • People may forget, dislike, or delay documentation, leading to minimal or incomplete records • Documentation can become outdated over time, making it challenging to keep track of updates. This requires ongoing effort and attention. • As the project grows in complexity over time, it becomes increasingly challenging to have proper documentation • Legacy codebases go hand in hand with the lack of documentation 	<ul style="list-style-type: none"> • Developers should fill in gaps in the documentation and improve its quality • Documentation should be improved compared to its current state • Focus should be on parts that are reused by other developers all the time • Management could allocate a few hours each month for every developer to focus on documentation tasks. During this time, developers can review and update documentation, identify outdated sections and make necessary revisions, even if it's just a few lines or the removal of obsolete information.

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Table 4.3 – continued from previous page

Pain Point	Can lead to overwhelm	Presumed causes	Suggestions
Undetailed Knowledge Resources	yes, 2/2	<ul style="list-style-type: none"> • Software is constantly changing • May be intentional, to filter or test new hires, or unintentional in some cases • This software solution is unique, which is why there is limited information available online. 	<ul style="list-style-type: none"> • L-Mobile should provide more information on the structure and architecture of the application. • L-Mobile should provide more information on the functionality of each model, the process, and the solution. • L-Mobile should include the meaning of components and how to use them in the training.
Broad Knowledge Expectations	yes, 1/1	<ul style="list-style-type: none"> • Most developers are supposed to do a wide range of things • No definition for backend and frontend developers 	no mentions
Difficulties in the On-boarding Advancement	yes, 1/1	no mentions	<ul style="list-style-type: none"> • More documentation and guidance • More resources, a view model, views, a code example or two • More examples on how to reuse code and where to find similar code
Continued on next page			

Table 4.3 – continued from previous page

Pain Point	Can lead to overwhelm	Presumed causes	Suggestions
Length of Onboarding Process	yes, 3/3	<ul style="list-style-type: none"> • Learning all the things needed to work on the applications requires time • Further shortening would require leaving out certain sections, which L-Mobile is already doing • Periods with no tasks or activities to work on cause even longer onboarding 	<ul style="list-style-type: none"> • Training should be received from all specialists involved. By doing so, production efficiency and algorithmic capabilities can significantly be improved in a short time. Instead of the standard three-month training period, we could potentially complete it in just one or two months. • Extended onboarding tends to get boring, so it should ideally be shorter. A duration of 2–3 months is too long, and it would be more effective if it were shortened to about one month.
Overreliance on Others	yes, 2/2	<ul style="list-style-type: none"> • Lack of documentation or knowledge resources 	<ul style="list-style-type: none"> • More documentation
Unsatisfactory Content	no, 2/2	<ul style="list-style-type: none"> • Some training content lacked specificity, both in the video and application components. It was overly vague and insufficiently detailed. • Certain videos had long durations and the content was uninteresting. 	<ul style="list-style-type: none"> • More code practices with colleagues or team leads can significantly enhance skills, especially when compared to spending months watching videos • Team-specific training

5 Discussion

This section discusses the findings presented in the results section across all three categories: demographic categories, subcategories, and the main categories which are discussed by answering research questions.

5.1 Demographic categories

The **demographic categories** provided valuable insight into the diversity of interviewees who contributed to this study. The analysis of the data revealed that prior experience in the software development field did not correlate with the number of pain points addressed or the depth of insights gained. While some more experienced participants naturally offered a broader perspective, this pattern was not consistently observed. Likewise, factors such as gender distribution and job descriptions did not seem to have a significant impact on the experiences of the interviewees.

These observations may suggest that the challenges and issues related to the onboarding process at L-Mobile transcend the boundaries of gender, job role, or prior experience and are more related to the nature of the onboarding process itself than to individual characteristics or background of participants.

5.2 Subcategories

Within the **subcategories**, several noteworthy trends emerge:

As depicted in Fig 4.3, 90% of participants reported a successful onboarding experience. This high success rate indicates that, overall, L-Mobile has succeeded in facilitating a positive onboarding process. This result is consistent with the company's commitment to ensure a smooth transition for new employees.

Fig. 4.4 shows a correlation between the length of the onboarding process and how long participants perceive it to be. This figure suggests that participants with a longer onboarding may have experienced longer periods of inactivity or redundancy, leading to feelings of impatience. This point is further discussed at the related pain point, the **Length of Onboarding Process**. On the other hand, participants with shorter onboarding periods may have felt more engaged and productive. This observation invites further optimization of the duration of the onboarding process to maintain motivation and efficiency.

This study revealed a unanimous positive attitude from all 10 participants toward their respective teams. The importance of the team cannot be overstated in the context of onboarding at L-Mobile. All participants highlighted the presence of a supportive team, supervisor or mentor who could

answer their questions and provide assistance, which underscores the importance of a knowledgeable and responsive support system for new employees. The opportunity to seek advice and clarification from team members was highly valued by the participants. This is consistent with Bauer's model [Bau10], which highlights the importance of mentor and peer support as a key component to a successful onboarding process.

5.3 Addressing the research questions

In this section, the research questions posed in this study will be answered, and several ways to minimize overwhelmed feelings and increase overall satisfaction during the onboarding process will be highlighted.

RQ1: Are there any perceived pain points in the onboarding process that participants are overwhelmed with?

This research uncovered a total of eight different pain points in the onboarding process at L-Mobile (Table 4.2). Seven of these were mentioned as potential causes of overwhelmed feelings by the majority of participants who have named the pain point. Most participants acknowledged that these pain points can lead to overwhelmed feelings, however, they did not consistently find the situations in which they appeared, to be overwhelming for themselves.

This can be attributed to several reasons: One important reason could be the different level of experience of the participants. Some participants are already seasoned developers with more than six years of experience in the field. For these individuals, pain points may not have a strong impact because they are familiar with the challenges of software development and already know how to deal with most of them.

Another reason could be the participants' ability to develop coping strategies [LF84]. They were likely able to adapt to the pain points and found ways to overcome them, which prevented or reduced overwhelming experiences. As mentioned earlier, the role of the team in seeking help or clarification was mentioned very frequently by the participants. Research has demonstrated that obtaining information and guidance from mentors, senior colleagues, and supervisors significantly contributes to successful onboarding outcomes and helps reduce stress [OK92]. This means that participants' coping mechanisms may include using the support system provided by a collaborative team, mentor, or team leader. While seeking help and guidance is essential to effective onboarding, participants also revealed a nuanced view. Two interviewees expressed concern about potentially asking too many questions and taking up the time of others, citing this as a pain point in the onboarding process. This overreliance on others was mentioned twice among participants and can potentially prevent new employees from taking advantage of this support system.

It is also possible that many participants felt a high level of fit between themselves and the work environment at L-Mobile. This P-E fit may have contributed to their overall well-being and job satisfaction and enabled them to better cope with the problems they identified.

In essence, P-E fit, the use of effective coping strategies by new employees, and the presence of strong support networks played a critical role in fostering a balanced onboarding experience, resulting in fewer overwhelming feelings and stress among new employees during their onboarding journey at L-Mobile.

RQ2: What are the causes of these pain points?

While some of these causes were rooted in the software itself and related to the pain point of **Difficulties with Legacy Code**, it is noteworthy that most of the causes identified were associated to the pain point **Lack of Documentation** and **Undetailed Knowledge Resources**.

Participants' engagement with large legacy codebases inherently bring documentation challenges. The application may have undergone many changes over time, and in some cases was developed or enhanced by a small number of developers who may no longer be part of the organization or as readily available. This lack of control can lead to incomplete or outdated documentation.

The application may have undergone many changes over time, and in some cases was developed or enhanced by a small number of developers who may no longer be part of the organization or as readily available. This lack of control can lead to incomplete or outdated documentation.

Another reason for the **Lack of Documentation** could be that L-Mobile may be deliberately do nothing about it. This might be because these pain points can serve as challenge stressors, and, according to LePine et al. [LPL05] and Podsakoff et al. [PLL07], can lead to increased effort from employees because of their potential to encourage self-directed learning and problem-solving. As one participant expressed, "*the problems are somewhat beneficial, [...] they can force the person to try harder, [...] also it can show the company if that person is a good fit or not.*" Such an approach could motivate employees to actively participate in improving documentation and seek knowledge on their own.

In addition, the **Undetailed Knowledge Resources** could play a significant role in intensifying the problem of documentation. Participants' lack of understanding of modules or components due to insufficient knowledge resources can demotivate new employees and affect their ability to navigate complex code bases.

Regarding the **Length of the Onboarding Process**, participants expressed understanding of the scope of the process and the amount of content a new employee must learn. However, Fig. 4.4 indicates that the longer the onboarding lasted, the more participants were dissatisfied with the duration. One potential explanation for this trend is the impact of **Unsatisfactory Content**. In cases where training content lacked specificity or failed to engage participants effectively, some training periods may have felt less valuable or necessary. This perceived training quality could contribute to the perception that the onboarding process is excessively long. In addition, pain points such as the **Length of the Onboarding Process**, or **Unsatisfactory Content**, can function as hindrance stressors [LF84], potentially leading to feelings of fatigue and boredom among employees.

RQ3: How could the company deal with these pain points to minimize overwhelmed feelings and maximize overall satisfaction with the onboarding process?

To answer this research question, the solutions proposed by participants will be explored, their potential effectiveness discussed, and recommendations made for L-Mobile to reduce overwhelm and increase overall satisfaction during the onboarding process.

The majority of the suggestions for improving the onboarding process at L-Mobile were closely related to two key pain points: **Lack of Documentation** and **Undetailed Knowledge Resources**. This indicates that participants highlighted the critical role of documentation and comprehensive knowledge resources in easing successful onboarding. Participants emphasized the responsibilities of both developer and management.

Developers should actively contribute to improving documentation. This would mean that they should fill gaps and improve documentation while working on code that relates to specific parts in the documentation. Management could provide more essential knowledge resources, such as information on the structure and architecture of the application, as well as more details on functionalities and procedures. In addition, it was suggested that management could allocate a certain amount of time each month to each developer for documentation tasks in order to improve the quality and completeness of documentation. In addition to these recommendations, L-Mobile might consider identifying and prioritizing critical software components or areas that are frequently reused. By focusing documentation efforts on these important areas, the company can efficiently use its resources and address the most important issues.

Another approach could be offering special training sessions and workshops for developers to address documentation practices, or assign responsibility for documentation to specific individuals or teams. Both can raise awareness of the importance of documentation and educate team members on best practices for integrating documentation tasks into the development process and ensure the regular updating and maintenance of documentation.

Implementing a peer review process for documentation and establishing a feedback mechanism can significantly enhance documentation quality. This would allow for evaluation and give developers a tool to report issues on the documentation.

Implementing these suggestions could have a significant impact on reducing overwhelm for new employees. Proper documentation and extensive knowledge resources enable employees to become more knowledgeable about the application's code, features, and structure and thereby may decrease uncertainties and stress [KH08; PMF17]. This, in turn, enables them to perform tasks more independently, which may increase their self-efficacy and reduce their reliance on others. Such improvements can enhance personal growth and development, potentially maximize the overall satisfaction of new employees and lead to positive onboarding outcomes [BBE+07; KW03].

One framework supports these propositions is the JD-R model which suggests that the work demands that can be high during onboarding, especially for developers with little experience, can be reduced if the necessary resources are provided. In this way, the balance between demands and resources can be maintained, resulting in less excessive demands and more personal performance, resulting in a positive outcome for both the individual and the company.

Several participants indicated that they felt the onboarding process should be shorter. They proposed changes to the content of the onboarding process to make it more concise and focused and expressed a desire for more specific training tailored to their respective teams. This suggests that a more

collective approach could be beneficial for teams, providing relevant and targeted training. They also recommended including more code practices into their onboarding, as well as trainings received from senior specialists. In addition to these recommendations, L-Mobile could consider implementing boot camps to boost the skills of new hires or offer pair programming sessions with these specialized senior developers. Considering these suggestions could significantly help reduce uncertainties for new employees during the onboarding process and thereby minimize overwhelm, as this approach is consistent with research showing that training positively correlates with job performance and the ability to cope [Sak95], as well as help their newcomer adjustment [Bau10] and contribute to the overall satisfaction of the onboarding process.

Certainly, L-Mobile could consider improving various aspects of the onboarding process, drawing inspiration from models like Bauer's. However, a more pragmatic approach would be to prioritize improvements in areas where participants encountered the most pain points. By focusing efforts on these critical areas, L-Mobile can maintain its positive track record and avoid potential setbacks, especially in the area of documentation.

6 Limitations & Threats to Validity

While this study provides valuable insights into the onboarding of software developers at L-Mobile, it is essential to acknowledge its limitations and the threats to validity.

The findings of this study are based on the unique environment of L-Mobile. The onboarding process and identified pain points may not be directly applicable to other organizations or industries, as different companies may have distinct practices and challenges. The sample size of the study, although sufficient for qualitative research, is relatively small. A larger sample could provide a more comprehensive understanding of the challenges and solutions at L-Mobile's various sites. Participants voluntarily took part in the interviews, potentially introducing self-selection bias. Those who agreed to participate may have different perspectives and experiences than those who declined. Conducting the interviews in English, which is not the first language for any of the participants, could have caused communication problems. Differences in language proficiency could affect participants' ability to fully understand certain questions, which could change the meaning or introduce unintended bias in their responses. Despite efforts to maintain neutrality during interviews, the interaction with participants can introduce bias into the data collection process, as for the participants' side, they may provide responses they believe are socially desirable rather than fully expressing their true opinions and experiences. Qualitative data analysis involves interpretation, which inherently introduces subjectivity. To mitigate this, interpreted data was shared with participants to ensure alignment with their intended meanings.

Despite the limitations and potential threats to validity, this study is intended to benefit future research and provide potential recommendations for improving the onboarding process in similar contexts.

7 Conclusion

In summary, this study sheds light on a relatively unexplored area in the field of onboarding, particularly in the context of software developers and examined the onboarding process through interviews with developers, uncovering the pain points they encountered during their onboarding journey at L-Mobile.

Table 4.2 and 4.3 summarize the key findings of the analysis which provide a valuable resource for management from L-Mobile seeking to enhance the onboarding processes. For L-Mobile, the findings revealed a prominent concern around the insufficient documentation of parts in the code base. This issue was primarily attributed from the legacy nature of the application's codebase, which presented challenges in terms of clarity and accessibility. In addition, several participants expressed a desire for more comprehensive and detailed knowledge resources to support their onboarding, as well as a shorter, more specific and targeted onboarding process, and emphasized the need for training that is more closely aligned with their roles and responsibilities.

These key issues shed light on the critical areas that L-Mobile should address to enhance the effectiveness and efficiency of their onboarding procedures. By focusing on the specific pain points identified, companies can make targeted improvements that lead to a smoother and more effective onboarding experience for their software developers.

As for future research, encouragement lies on exploring the pain points of software developers from quantitative perspectives at different companies. While this study focused on the specific challenges faced by software developers at L-Mobile, there is a need to broaden the scope of the research to gain a more comprehensive understanding of onboarding practices, pain points and their outcomes across different environments.

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All links were last followed on September 19, 2023.

A Study description and consent form

CONSENT FORM

The following consent form has been handed out to each of the participants. All participants read and understood this form and confirmed this with their signature.

CONSENT FORM

DESCRIPTION:

You are invited to participate in my interview on the onboarding process at L-Mobile. The purpose of this interview is to extract any reports of pain points during the onboarding process that can lead to overwhelm, explore how these points arise, as well as find suggestions for maximizing overall satisfaction with onboarding.

TIME INVOLVEMENT:

The duration of the interview may vary, but I limit the time to 30 minutes per interview.

DATA COLLECTION:

During the interview, I create an audio record, which will be put into a verbatim written transcript afterwards. You will receive the transcript of your answers afterwards. You can check the transcript for correctness and delete parts of it that shouldn't be analyzed. After transcription, the audio record will be deleted completely from all file systems. After the analysis of the transcript, you will receive the interpretation of your data, which you can also check for correctness and delete wrong interpretations.

RISKS AND BENEFITS:

There is no risk of any data leak, and the collected data is securely stored. We do guarantee no data misuse and privacy is completely preserved. The identity of your company won't be mentioned in our study and remains completely anonymous. Your decision whether to participate or not in these interviews will not affect the way your company is mentioned in the study. The results of the study might be published in academic context and might also help your company to improve the working conditions for developers.

PARTICIPANT'S RIGHTS:

If you have read this form and have decided to participate in this project, please understand your participation is voluntary, and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. The alternative is not to participate. You have the right to refuse to answer any questions or topics. The results of this experiment will be analyzed in my Bachelor thesis, which is part of my computer science bachelor at University of Stuttgart. Your identity is not disclosed to anyone unless I directly inform you and ask for your permission.

CONTACT INFORMATION:

If you have any questions, concerns, or complaints about this research, its procedures, risks and benefits, you may contact me (Benjamin.rama@web.de). By signing this document, you confirm that you agree to the terms and conditions.

Name of Participant

Signature of Participant