

MESG
MESTRADO EM ENGENHARIA
DE SERVIÇOS E GESTÃO

Promoting Digitalisation in SMEs through Internships:
Developing a Service Design Framework

Sofia Andreia Marques Silva

Master Thesis

Supervisor: Prof. José Coelho Rodrigues



2023-09-11

제 몫의 빛으로 환하게 비출 테니

Abstract

This dissertation provides a comprehensive examination of the components of a critical framework for Small and Medium-sized Enterprise (SME) internship programs and their role in driving digitalisation. SMEs play a pivotal role in today's economy, and their ability to embrace digital transformation is essential for their competitiveness and sustainability. The study reviews existing literature to identify key components, including mentorship, skill development, and alignment with business objectives, which contribute to the success of internship programs in fostering digitalisation within SMEs.

This dissertation provides insights into how SMEs can optimise their internship programs to expedite their digitalisation efforts through an exhaustive analysis of academic journals and research papers. The findings highlight the symbiotic link between SMEs and interns, emphasising the potential for interns to serve as digital transformation catalysts when working within a well-structured framework.

Additionally, it's important to note that the empirical research, including interviews and focus groups, played a crucial role in creating the framework. This empirical work significantly contributed to the framework's development by informing its design and ensuring its practical applicability in real-world SME internship programs.

Keywords: Digitalisation; Framework; Internship Programs; Service Design; SME

Acknowledgments

I wish to dedicate this page to express my heartfelt appreciation to the remarkable individuals who have made a profound impact on my academic journey and personal growth. Their unwavering support, positivity, and availability have been instrumental in my success.

First and foremost, I owe a special debt of gratitude to my supervisor, Prof. José Coelho Rodrigues. The understanding that Prof. José Coelho Rodrigues exhibited regarding my situation was instrumental in my success on this path. His ability to comprehend and support me, even when I faced personal and academic challenges, was a crucial factor in my motivation and perseverance. It is with profound appreciation that I acknowledge his contribution to the development of this thesis.

I also want to thank Prof. Lia Patrício, Prof. Jorge Grenha Teixeira, and all the esteemed professors who have enriched my academic journey at FEUP. Your wisdom, knowledge, and dedication to teaching have been instrumental in shaping my academic pursuits, and I am grateful for the opportunities I've had to learn from you.

To my cherished friends from my bachelor's degree, who have remained dedicated companions throughout the years, I extend my heartfelt thanks. You have been an essential part of my growth, offering unwavering friendship and support. A special mention goes to my best friend, whom I had the privilege of meeting during those formative years. Your presence in my life has been a source of support and joy, and I am deeply grateful for our enduring friendship.

To my friends from my master's program, you have been a wonderful surprise and an incredible source of support. Your willingness to always be there, ready to assist and encourage, has been deeply appreciated. You have made this journey more enriching, and I am fortunate to have you as friends.

Finally, I extend my deepest gratitude to my family, whose love and support have been an anchor of stability and motivation. To my parents, for the unwavering belief in my dreams and aspirations. They not only provided me with the opportunity to pursue my studies but also offered unwavering support and encouragement along the way. Their belief in my ability to choose my path has been a driving force in my life. To my brother, your guidance and support have been invaluable, and I am grateful for that. And to Perdita and Kafka, my two beloved pets, I am thankful for their companionship and for brightening my days.

In conclusion, this thesis is a culmination of the collective support, positivity, and unwavering belief in my potential from these remarkable individuals. Their presence in my life has been a constant source of motivation and inspiration, and I am deeply thankful for their contributions to my academic and personal growth.

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List of abbreviations

FEUP: Faculty of Engineering of the University of Porto

L&D: Learning and Development

MESG: Master in Services Engineering and Management

SMEs: Small and Medium-Sized Enterprise

1 Introduction

Adoption and integration of digital technology have become a basic need for organisations across industries in an era marked by rapid technological breakthroughs (Zaki, 2019). Small and Medium-sized Enterprises (SMEs) play an important role in this landscape as suppliers to larger enterprises and active participants to the global economy (Ortiz et al., 2023). However, due to resource restrictions, restricted access to expertise, and an ever-changing technology landscape, SMEs frequently face specific obstacles in keeping up with digitalisation (Khan, 2022). The core focus of this dissertation is on the objective of contributing to a framework tool based on service design that helps to create adequate internship programs that aim to contribute to the digitalisation of SMEs.

This dissertation is integrated in the Master in Services Engineering and Management at Faculty of Engineering of University of Porto, and it is focused on addressing the challenges and opportunities that SMEs face as they go through the digital age. The application of service principles to digitisation processes inside SMEs is a fascinating and lively topic of study. This work intends to make a significant contribution within this academic setting.

The primary focus of this research is to delve deeply into the multifaceted environment of SMEs' digital transformation through the strategic integration of internship programmes. These programmes are intended to serve as bridges between the academic sector, where digital concepts are taught, and the practical world, where they must be implemented (Arthur & Koomson, 2023). This research aims to provide actionable insights and a framework that will enable SMEs to leverage the full potential of digital technology by closely exploring how internships may be customised to fit the digitalisation needs of SMEs.

The topic of this dissertation is: Developing a Service Design Framework to help Promoting Digitalisation in SMEs through Internships. It reflects the commitment to exploring and proposing innovative approaches that empower SMEs with the digital capabilities necessary for thriving in the modern business environment.

SMEs face an urgent need to adopt digitalisation in today's dynamic business world, which is characterised by rapid technology breakthroughs. This transition is critical not only for their competitiveness, but also for their survival in a world that is becoming increasingly digital (Verhoef et al., 2021).

The following sections of this dissertation will conduct a thorough examination of different aspects, including internship programme structures and crucial framework components. This study intends to add not just to scholarly debate, but also to the practical tools and strategies accessible to SMEs as they embrace the digital future.

It is expected that at the end of the research, it will be possible to have a clearer vision of what this critical topic covers, and what is necessary to develop internship programs that promote the digitalisation of SMEs.

1.1 Problem Description

Industry increasingly depends on digital technologies and systems, the basis of everyday work and equipment (M.E. Sepasgozar, 2021). As technology changes at an unprecedented

pace, ensuring that the current and future workforce is equipped with the necessary technological and innovation skills is vital (Li, 2022). Up/reskilling of the workforce is frequently tricky for SMEs. However, it is essential, as SMEs are often suppliers of big, mature companies that work and require their suppliers to work based on state-of-the-art technologies (OECD, 2023).

1.2 Research Questions

This study enrolls on a mission of deep relevance among the complicated tapestry of challenges and opportunities that defines the present landscape of SMEs. It aims to untangle the complications that SMEs face as they go through the digital age, in which innovation and adaptation are critical.

Following the challenges posed, there are various programme formats to align with the unique needs and opportunities, in the intricate landscape of enhancing digitalisation through internship programmes within SMEs. This study tackles three critical research topics to untangle the intricacies and outline a path towards practical answers. The research questions that are addressed by this study are the following:

RQ1: What are the possible formats for internship programs within SMEs, and how can they be tailored to enhance digitalisation efforts?

RQ2: What are the key components of a framework for SMEs aiming to enhance digitalisation through internships?

RQ3: How can service design principles enhance digitalisation efforts in SMEs through internships?

1.3 Report Outline

This report consists of six different parts: Introduction, Literature Review, Methodology, Results, Discussion and Conclusion.

The Introduction explains well what the project is about and what this reading will provide to the reader.

After introducing all the concepts and goals of this study, we move on to the Literature Review. The Literature Review is “the selection of available documents on the topic, which contain information, ideas, data, and evidence written from a particular standpoint certain aim of (...) topic and how it is to be investigated” (Hart, 1998, p.13).

The Literature Review of this dissertation will consist of the explanation and contextualisation of the critical concepts of this project by using scientific articles to validate and explain those concepts. The ideas that will be considered are formats for digitalisation internships in SMEs, sustainable implementation of digitalisation internships and service design for SMEs.

After analysing all the concepts, it is vital to examine the Methodology as it is the next phase. In this section, all the techniques and methods are explained in detail to make the reader understand how achieving the study’s aims was possible.

The Results section follows, where the project's findings are examined and explained in detail - what were the conclusions that arose from the interviews, as well as all the data that was collected and analysed. In this section, it is present the core of the study findings. It includes the creation and explanation of the Service Design Framework for Internship Programmes. This framework incorporates critical elements, methods, and

recommendations for improving digitalisation initiatives within SMEs through internship programmes. This part provides a thorough examination of the framework developed based on the study results.

Then, the Discussion section, which is where will help understand and analyse the previous results. It investigates the consequences of the previous findings, examining their relevance in the context of service design and digitalisation in SMEs. This part addresses the research questions, emphasising how the framework connects with the study's objectives.

Finally, the Conclusion, serves as the culmination of the dissertation. It summarises the important findings from the research, emphasising the significance of those findings and their application to SMEs and service design.

2 Literature Review

The Literature Review is “the selection of available documents on the topic, which contain information, ideas, data, and evidence written from a particular standpoint certain aim of (...) topic and how it is to be investigated” (Hart, 1998, p.13).

This literature review is composed of three main topics related to the promotion of digitalisation in small and medium-sized enterprises (SMEs) through internship programs. The first topic discusses the various formats for digitalisation internship programs in SMEs. The second topic explores some critical Framework components in the context of SME Internship Programs. Finally, the third topic focuses on the application of service design principles for the development of effective digitalisation internship programs in SMEs. Through an examination of these topics, this literature review aims to provide insights into the best practices for designing and implementing effective internship programs for digitalisation in SMEs.

2.1 Digitalisation Internship Programs in SMEs

Since internship programs provide students with real-world experience and provide SMEs with access to digital talent, they have been recognised as essential for promoting digitalisation in SMEs (Rohm et al., 2021). Therefore, while creating digitalisation internship programs in SMEs, it is crucial to consider the advantages and disadvantages of various forms of internship.

Digitalisation has become a crucial aspect of modern business, and SMEs are no exception. Internship programs that focus on digitalisation provide a unique opportunity for students to gain practical experience in this field, while also contributing to the digital transformation of SMEs (Wayman, 2019).

One model that may be employed in internship programs for digitalisation in SME's is experiential learning. This learning method involves assuming students in settings where they can use their knowledge and abilities to address real-world issues. Since experiential learning allows students to engage in digital projects with practical applications, it can be conducive to fostering digitalisation in SMEs (DeCoster & Naatus, 2017). For instance, an SME client's digital marketing campaign could be created by students taking part in an experiential learning internship program at a digital marketing agency. This approach allows SMEs to access digital talent while students gain crucial hands-on experience.

One of the other key formats for internship programs for digitalisation in SMEs is project-based internships. In this format, interns work on specific digitalisation projects under the guidance of a mentor. This allows them to apply their theoretical knowledge to real-world problems and develop practical skills in areas such as data analysis, software development, and digital marketing (Wayman, 2019). Project-based learning promotes digitalisation in SMEs by allowing students to work on projects relevant to SMEs' digitalisation needs (Handriyantini et al., n.d.). This format provides SMEs access to digital talent while also assisting them in addressing specific digitalisation concerns.

Another format is rotational internships, where interns rotate through different departments within the SME. This provides them with a holistic understanding of the company's digital operations and allows them to see how different departments interact and collaborate in the digital space (Sidło et al., 2020).

Another format that can be used to encourage digitalisation in SMEs is virtual internships. Students in this format collaborate remotely with SMEs to create digital projects (Franks & Oliver, 2012). A virtual internship program, for example, could entail students collaborating with an SME to develop an e-commerce platform. This format provides SMEs access to digital talent while also assisting them in overcoming geographical limitations. This format has become increasingly popular due to the COVID-19 pandemic and the subsequent shift towards remote work (LaBerge L et al., 2020). Remote internships allow SMEs to tap into a wider talent pool, as they are not limited by geographical constraints (OECD, 2023, p. 41).

Regardless of the format, successful internship programs for digitalisation in SMEs typically have a strong emphasis on mentorship and continuous learning. Interns should be paired with experienced mentors who can guide them through their internship journey and provide regular feedback on their performance (OECD, 2023a, p. 41)

In conclusion, the choice of internship format is pivotal in determining the success of programs aimed at promoting digitalisation in SMEs. Experiential learning, project-based learning, rotational internships, and virtual internships stand as four effective formats, each with its unique advantages. To make an informed decision, SMEs can leverage a structured decision-making framework. By carefully weighing the advantages and disadvantages of these formats and aligning them with their specific needs, SMEs can strategically navigate their digitalisation efforts, ensuring that they access the right digital talent and provide students with invaluable practical experience.

2.2 Critical Framework Components in the Context of SME Internship Programs

Internship programs in (SMEs) play a crucial role in bridging the gap between academic learning and real-world business practices. These programs provide students with valuable work experience, enhance their employability, and equip them with the necessary skills required in the job market (Callanan & Benzing, 2004). These programs are critical for the development of a skilled workforce, and their success depends on several key components.

One of the critical components of SME internship programs is a well-defined structure and clear objectives (Beard, 2007). The internship programs should be designed in a way that aligns with the company's strategic goals and provides interns with a clear understanding of what they are expected to learn and achieve during their internship period (Beard, 2007).

Another key component is effective mentorship. Mentors guide interns through their learning journey, providing them with valuable insights and feedback. They play a crucial role in creating a conducive learning environment for the interns (Eby et al., 2008).

Another component is a comprehensive, coordinated strategy that engages the organisation and encourages collaboration. This strategy should be designed to manage the development of people in a way that supports other key business priorities (Mikołajczyk, 2022).

For instance, Learning and Development (L&D) strategies have been identified as essential components of successful internship programs. These strategies not only improve productivity but also contribute to employability (Mikołajczyk, 2022). In today's competitive business landscape, employees are retained only as long as they can add value to an enterprise (Callanan & Benzing, 2004). Therefore, opportunities for learning and

development have become one of the top criteria for joining organisations (Mikołajczyk, 2022).

Moreover, human capital requires ongoing investments in L&D to retain its value. When knowledge becomes outdated or forgotten, the value of human capital declines and needs to be supplemented by new learning and relevant work experiences (Mikołajczyk, 2022).

Innovation in internships is another critical component for SMEs, particularly when it aids in fostering innovation within the organisation.

A study published in *The Journal of Technology Transfer* (Hilkenmeier et al., 2021) highlighted the effectiveness of a project-based technology transfer approach to foster innovation in SMEs. The study presented a large-scale collaboration program focusing on project-based technology transfer in SMEs with little to no prior experience in collaborative research projects. The core of this collaboration program was the temporary secondment of scientists from a Research and Technology Organisation (RTO) into an SME to jointly work on a practical project objective, which was directly tailored to the demands of the SME (Hilkenmeier et al., 2021).

The findings from this study, using self-reported and objective data from 106 different projects, highlighted that most SMEs not only successfully mastered a challenging topic in the context of industry 4.0 that immediately benefits the organisation, but also engaged in new R&D projects to strengthen their scientific and technical human capital in the long term (Hilkenmeier et al., 2021).

Another study published in the *Journal of Innovation and Entrepreneurship* (Adam & Alarifi, 2021) developed a theoretical model to provide insights about the association between innovation practices and the SMEs' performance and survival, underlining the auxiliary role of external support in such a relationship. The results showed that the innovation practices adopted by SMEs had a positive impact on performance and likelihood of business survival (Adam & Alarifi, 2021).

Therefore, internships that focus on innovation can play a significant role in enhancing the competitiveness and growth of SMEs. They not only provide an opportunity for SMEs to access new knowledge and skills but also foster an environment that encourages continuous learning and innovation.

In addition to these components, SMEs also need to consider external factors such as legal requirements and market conditions when designing their internship programs (Trnka et al., 2022). For instance, they need to ensure that they comply with labour laws regarding internships. They also need to stay updated on industry trends so that they can provide their interns with relevant and up-to-date training (de Vos & Willemse, 2021).

In conclusion, SME internship programs require careful consideration of critical components. These include a clear program structure with aligned objectives, effective mentorship, comprehensive L&D strategies, and a focus on innovation. L&D strategies are essential for improving productivity and employability in today's competitive landscape. Moreover, SMEs should consider external factors like legal requirements and market conditions. By integrating these components, SMEs can successfully manage people's development, enhance productivity, and foster innovation, ultimately contributing to their growth and competitiveness.

2.3 Service Design for Organisations

The field of service design in firms has gained increasing attention in recent years (Teso & Walters, 2016).

According to Patrício et al., (2011), service design can significantly drive organisational change in firms. The authors also identify some challenges firms may face in incorporating service design, including a lack of resources, a limited understanding of service design, and resistance to change. To overcome these challenges, the authors suggest that firms should involve employees and customers in the design process, build partnerships with design firms, and invest in training and education to increase awareness and understanding of service design (Patrício et al., 2011).

Service design is a multidisciplinary approach that involves methods and theories from fields such as design, management, and marketing (Patrício et al., 2011). In the context of SME digitalisation internships, service design also plays a crucial role in creating meaningful experiences for interns and delivering value to the organisation.

One of the key aspects of service design in the context of SME digitalisation internships is the creation of a user-centered design process (Fitz et al., 2022). This involves understanding the needs and expectations of interns, and designing services that meet these needs while also aligning with the strategic objectives of the SME (Fitz et al., 2022).

Another important component is the use of digital technologies to enhance service delivery. This can include the use of digital platforms for communication and collaboration, as well as the integration of digital tools into the service delivery process (Patrício et al., 2008).

Furthermore, service design in firms also involves the development of a service blueprint. This is a visual representation of the service process, which helps to identify potential bottlenecks and opportunities for improvement (Grenha Teixeira et al., 2017).

In addition to these components, effective service design also requires collaboration across different departments and stakeholders. This includes not only the management team and employees but also the interns themselves. By involving all stakeholders in the service design process, SMEs can ensure that their digitalisation internships deliver value to everyone involved (Stickdorn et al., 2018).

When developing internship programs, service design principles can ensure that they are created considering both students and SMEs in mind, resulting in mutually beneficial outcomes. The user experience (UX) should be designed to maximise students' learning experience and the firms value (Fitz et al., 2022). To accomplish this, it is vital to determine the necessary digitalisation skills and expertise and build the internship program accordingly.

A different service design component for SME digitalisation internships is developing a program's sustainable and scalable business strategy. This includes establishing program financing sources, outlining stakeholder roles and responsibilities, and building a clear communication plan (Akhtar-Schuster et al., 2011).

Service design can also be used to ensure that the internship program is consistent with the SMEs' broader digitalisation plan. Understanding the SMEs' digitalisation goals, defining the digital skills required to attain those goals, and developing the internship program are all part of this process (Philbin et al., 2022).

Additionally, a co-design perspective on data, holds immense promise in SME digitalisation internships. This approach encourages collaborative data-driven decision-making, allowing SMEs and interns to harness data insights effectively. It fosters a culture of innovation and adaptability, aligning adequately with the dynamic nature of digitalisation efforts in SMEs (Seidelin, 2020).

In conclusion, the use of service design concepts can substantially support the development and implementation of digitalisation internship programs for SMEs. Understanding the unique digitalisation goals of SMEs and defining the digital skills required to achieve those goals can help service design create successful and long-lasting internship programs that support the development of digital skills and competences among employees. As a result, future study should concentrate on the development of internship programs for digitalisation in SMEs through service design. Therefore, service design provides a powerful framework for SMEs to enhance their digitalisation internships.

3 Methodology

3.1 Research Approaches

According to Eisenhardt, (1989), there are three main research approaches: quantitative, qualitative, and combination of both.

Quantitative Research usually involves investigating data through statistics, mathematics, and the processing of quantitative data. According to Goertz & Mahoney, (2012), quantitative research data is generally analysed numerically. The statistics used in quantitative research are usually utilised when: there is a need to process large volumes of quantitative data, there is uncertainty related to theories under consideration when questionnaires containing simple questions and short answers are used, and when data used can be quantified and compared (Basias & Pollalis, 2018).

Qualitative Research can be defined as “(...) a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that makes the world visible (...) These practices...turn the world into a series of representations including field notes, interviews, conversations, photographs, recordings, and memos” (Denzin, 2018).

Qualitative research explores, understands, and describes social phenomena, experiences, perspectives, and behaviours. It is often used to gain an in-depth understanding and uncover the meaning and significance of the subject under study.

The Combination of qualitative and quantitative research approaches results in the mixed approach, an integration of the two forms of research. According to Creswell & Creswell, (2018), “The core assumption of this form of inquiry is that the integration of qualitative and quantitative data yields additional insight beyond the information provided by either the quantitative or qualitative data alone.”

Within qualitative research, a research method that can be used is the Case Study, a research method that involves an in-depth examination of a single case or a small number of cases. It allows exploring complex phenomena within their real-life context and aims to uncover the richness and complexity of a particular phenomenon by examining the interaction between multiple variables within a single case. The case study method is considered a valuable tool for developing new theories and testing existing ones (Yin, 2009). A case study aims to examine a complex situation and the multiple factors involved in a given behaviour to determine the current status and identify the causal factors operating.

3.2 Qualitative Research

After researching the diverse approaches that could be used in this dissertation, it was decided that the chosen methodology would be the qualitative case study.

This study employs a qualitative research approach to investigate the intricate domain of service design for internship programs for digitalisation in SMEs. The qualitative approach was chosen for its suitability in exploring multifaceted research questions, generating frameworks, and providing a deep understanding of the subject matter. The decision to adopt this approach aligns with the exploratory and complex nature of the research objectives.

In this research, data collection was meticulously planned to gather comprehensive insights into the topic of SME digitalisation and the role of internship programs. Three primary methods were employed: semi-structured interviews, a focus group, and a comprehensive review of scientific articles.

Qualitative research is a valuable approach in the development of a service design framework for internships aimed at promoting digitalisation in SMEs. It provides rich, detailed insights that can help to understand complex phenomena such as the experiences, motivations, and behaviours of interns and other stakeholders.

One of the key benefits of qualitative research is its ability to provide a deep understanding of people's experiences and perspectives (J. W. Creswell & Poth, 2016). This is particularly relevant in the context of service design for internships, where understanding the needs and expectations of interns is essential. Qualitative methods such as interviews, focus groups, and observations can provide valuable insights into how interns interact with digital technologies, what challenges they face, and how they perceive the value of their internship experience (J. W. Creswell & Poth, 2016).

Another benefit of qualitative research is its flexibility. Unlike quantitative research, which requires a predefined hypothesis and structured data collection methods, qualitative research allows for more flexibility in exploring unexpected themes or issues that may arise during the research process (Flick, 2022). This can be particularly useful in the rapidly evolving field of digitalisation, where new technologies and practices are constantly emerging (Flick, 2022).

Furthermore, qualitative research can help to foster empathy and understanding among the stakeholders involved in the internship program. By sharing the stories and experiences of interns, qualitative research can help to build a shared understanding and empathy among program designers, mentors, and managers (Sanders & Stappers, 2008). This can facilitate more effective communication and collaboration, ultimately leading to a more successful internship program (Sanders & Stappers, 2008).

In conclusion, qualitative research offers valuable benefits in the development of a service design framework for digitalisation internships in SMEs. By providing deep insights into the experiences and perspectives of interns, offering flexibility in exploring emerging issues, and fostering empathy among stakeholders, qualitative research can significantly contribute to the success of digitalisation internships.

3.2.1 Focus Group

The focus group titled "Enhancing SME Digitalisation: Insights from Former Interns" aimed to gather the perceptions and experiences of former interns regarding their internship experiences and their perceptions of how these programs can contribute to SME digitalisation. This focus group consisted of four participants who had prior internship experiences in SMEs, one of them was focus on the digitalisation process of the organisation.

The focus group session was meticulously designed, with careful consideration given to its objective, participants, location, equipment, and materials. The facilitator, the principal researcher, played a crucial role in guiding the discussion. Besides, each participant had almost the same age cap and they all finished their internships for over a year ago.

This focus group comprised four participants who had previously undergone internship experiences in SMEs, bringing a diverse range of insights to the session. The objective was to explore their unique advantage points regarding the intersection of internships and SME digitalisation.

In conducting the focus group session, inspiration was drawn from the works of different prominent authors in the field. These authors have influenced the design and structure of the session, contributing valuable insights that enriched the overall research process. Their expertise and research findings have been instrumental in shaping the methodology and approach used in this study.

Breen's (2006) work on focus group research provides a practical guide on how to conduct focus groups, including the planning, preparation, conducting, data analysis, and dissemination of results. While the second authors inspiration begins by describing what is understood by this methodological tool as well as its main applications, especially at the level of research projects (Soares Silva et al., 2014).

The session began with a brief introduction of the facilitator and the session's objectives. An agenda was presented, outlining the structure and order of topics to be discussed. An icebreaker activity, "Digitalisation Journey Mapping," was used to kickstart the session, encouraging participants to share challenges related to digitalisation they had encountered during their internships.



Figure 1- Focus Group

Following the icebreaker activity, a series of open-ended questions were given to the participants, allowing them to share their perspectives on various aspects of internship experiences and digitalisation in SMEs.

Additionally, a creative activity involving the creation of a digital persona was conducted collaboratively. This persona represented an ideal intern for an SME, with a strong focus on digitalisation, allowing participants to collectively envision and articulate the qualities and skills such an intern should possess.



Figure 2- Focus Group (Creation of a Digital Persona)

The focus group session lasted for approximately two hours, with active participation from all four participants. The rich insights gleaned from this session served as a foundational understanding before embarking on individual interviews, providing valuable context, and shaping the direction of subsequent research endeavours.

3.2.2 Interview

Data was also collected through several interviews that “(...) unlike survey research, in which the number and representativeness of the sample are major considerations, in this type of research the crucial factor is not the number of respondents but the potential of each person to contribute to the development of insight and understanding of the phenomenon” (Merriam & Tisdell, 2015).

In order to collect data for the project it was decided to use interviews since an interview is defined as “(...) a process in which a researcher and participant engage in a conversation focused on questions related to a research study” (deMarrais & Lapan, 2003). Interviews in the organisation would be very valuable for the thesis because it would allow us to have the real perspective from inside the organisation the case study was taking place in.

The interview phase marked a pivotal stage in the data collection process. To ensure the robustness of the research, a meticulous approach was taken. Initially, a flexible interview script was developed, serving as a guideline for the interviews (see Appendix 1). This script underwent rigorous review to minimise potential biases, maintain neutrality, and ensure that questions were framed objectively.

The final interview script featured a semi-structured format, and it is worth noting that the number of questions varied from six to nine in different interviews, reflecting the adaptive nature of the approach. This flexibility allowed for in-depth exploration of specific areas of interest based on the interviewee's background and expertise.

Interviews were tailored to the specific expertise and roles of the participants. For instance, one interviewee who worked directly with internships provided valuable insights into internship program dynamics, while others, more focused on digital transformation, shared their expertise in that domain. This approach ensured that the interviews were both contextually relevant and comprehensive in addressing the research objectives.

In preparation for the interviews, a comprehensive email (see Appendix 2) was crafted. This email introduced the interviewer, clarified the interview's content and objectives, and presented interviewees with the choice of an online or face-to-face interview. Additionally, it provided information regarding the expected interview duration and offered a selection of dates for scheduling convenience.

Outreach efforts extended to ten prospective interviewees, resulting in valuable feedback from four of them.

It is imperative to note that ethical and legal considerations were paramount throughout the interview process. At the commencement of each interview, participants were explicitly asked for authorisation to record the session. Moreover, participants were reminded of an informed consent document (see Appendix 3), that was already attached on the email sent before, where they would willingly provide consent for their participation and gathered information from the interviews.

The interview sample intentionally featured individuals from diverse organisations, each contributing with a unique perspective. While these participants boasted varied educational backgrounds, including mechanical engineering, psychology, industrial management, and service engineering and management, their roles within their respective organisations also differed significantly. This diversity was instrumental in offering multifaceted insights into the realm of digitalisation within SMEs through internships. It significantly enriched the data collection process, aligning with the central focus of this thesis, which is the development of a service design framework to promote digitalisation in SMEs.

Table 1- Sample Characterisation

Interview Sample			
Role in the company	Background Education	Duration of the interview	Online or Face
Principal Researcher on Service Design	Management and Industrial Engineering	40	Online
Business Manager	Mechanical Engineering	46	Online
Head of Digital Transformation	Services Engineering and Management	35	Online
Head of People and Culture	Psychology	18	Online
Average Interview Duration: 35 minutes			

The interviews were conducted online, using video conferencing tools, from zoom to google meets to facilitate real-time interaction and accommodate participants' preferences for convenience and familiarity. On average, each interview lasted approximately 35 minutes, ensuring depth of conversation without imposing excessive time demands on participants (Table 1).

The insights gathered from these interviews complemented the focus group data, providing a holistic view of the research topic.

3.2.3 Review of Scientific Papers

In tandem with the primary data collection efforts, a comprehensive review of existing academic literature was conducted. This secondary data collection method entailed an exhaustive examination of peer-reviewed articles, journals, and scholarly publications, specifically focusing on subjects pertinent to SME digitalisation, and internship programs.

The literature review served as a cornerstone for this research, fulfilling several pivotal roles within the study. Firstly, it established the theoretical foundation upon which the entire research was built. By delving into the body of existing knowledge on SME digitalisation, service design, and internship programs, this review facilitated a deeper understanding of the research landscape. It allowed the study to be situated within the broader academic discourse on these topics, grounding it in established theories, frameworks, and best practices.

Moreover, the insights drawn from the comprehensive literature review played an instrumental role in shaping the data collection process. The findings and trends identified in the academic articles influenced the development of interview questions and the structure of the focus group discussion guide. This meticulous alignment ensured that the primary data collection phase was tightly integrated with the existing scholarly knowledge, enhancing the robustness of the study.

The review process adhered to rigorous and systematic methodologies. It encompassed the identification, evaluation, and synthesis of relevant literature, employing established search strategies and citation analysis. The result was a synthesised body of knowledge that not only informed the research but also contributed to the broader academic conversation on SME digitalisation, service design, and the role of internships.

In summary, the review of academic articles constituted an integral and valuable component of this research, bridging the theoretical and empirical aspects. It not only provided the essential theoretical underpinning but also enriched the primary data collection by contextualising it within the existing scholarly landscape. This synergy between theory and practice forms the bedrock upon which this thesis is built.

3.3 Data Analysis

Data analysis serves as the foundational step in this research, forming the basis for the subsequent examination of interview and focus group data. In this section, we embark on a comprehensive data analysis journey, outlining the methodologies applied and the essential insights derived from the dataset.

In the forthcoming sections, we delve into the analysis of focus group data (3.2.1) and interviews data (3.2.2), exploring the unique insights each source provides. The synthesis of these findings will culminate in the development of a robust service design framework, poised to guide SMEs in their digitalisation journeys.

3.3.1 Focus Group Discussion Analysis

In this section, we delve into the pivotal process of analysing the data obtained from focus group discussions. The aim of this analysis was to extract meaningful insights and patterns from the rich tapestry of discussions held during the focus group sessions.

The analysis approach employed for the focus group data was Descriptive Coding and Simultaneous Coding. Descriptive coding is a type of qualitative data analysis that involves assigning labels to pieces of data to summarise and categorise them. This method is often used in the initial stages of data analysis to provide an overview of the data and identify patterns (Miles et al., 2013). Descriptive coding can be particularly useful when dealing with large amounts of data, as it helps to organise the data into manageable categories (Miles et al., 2013).

Simultaneous coding, on the other hand, involves applying multiple codes to a single piece of data (Miles et al., 2013). This method recognises that a single piece of data can contain multiple concepts or themes and allows for a more nuanced analysis. Simultaneous coding can be particularly useful in complex studies where the data is rich and multifaceted (Miles et al., 2013).

Both descriptive and simultaneous coding are valuable tools in qualitative research. They provide researchers with flexible and robust methods for analysing and interpreting their data. By using these methods, researchers can gain a deeper understanding of their research topic and generate meaningful insights (Miles et al., 2013).

Through this process, the essence of the discussions, including recurring ideas, concepts, and emerging topics, was depicted. Descriptive coding facilitated the organisation and categorisation of the focus group data, laying the foundation for deeper exploration.

3.3.2 Interview Analysis

The analysis of the interview data was a complementary facet of the methodology. It aimed to extract in-depth insights and perspectives from the individual interviews conducted as part of the research.

The interview analysis started by transcribing each and every interview into a Microsoft Word document in a full verbatim transcription. After transcribing the interviews, the content of each of them was analysed.

The analysis approach employed for the interview data was the same as for the focus group, using Descriptive Coding and Simultaneous Coding. In this approach, sets of text were coded with topics that summarised their contents.

Through these rigorous analytical procedures, the systematic extraction, organisation, and comprehension of the wealth of data obtained from both focus group discussions and individual interviews were achieved. This robust analysis laid the foundation for the subsequent stages of the research, enabling the derivation of valuable insights and conclusions that form the basis of this thesis.

4 Service Design Framework for Internships Programs

4.1 Analysis

4.1.1 Insights from Focus Group

The focus group discussion was a pivotal component for this research effort, offering profound insights into the challenges and opportunities inherent in internships within SMEs. The participants, drawing from their diverse internship experiences, engaged in a vibrant dialogue that illuminated key themes pivotal to the study's objectives.

One of the central points of discussion revolved around the challenges frequently encountered by interns during their tenure in SMEs. Among these challenges, the lack of redundancy in digital processes emerged as a common concern. The participants pointed out that while many aspects of the businesses they worked with had undergone digital transformation, essential data was sometimes confined within personal accounts, leading to fragmentation and inefficiency. Moreover, they noted that certain software applications were still installed locally on company computers, with the need of involving an involvement of an intermediary within the organisation. Access issues were also raised, including delays in VPN access and difficulties accessing necessary work tools.

Participants unanimously emphasised the significant contributions of their internships in enhancing their comprehension of digitalisation processes within SMEs. These experiences exposed them to the imperative of customisation, whereby digital solutions need to align with the unique requirements and contexts of SMEs. Furthermore, they found that these internships dispelled questions about the reliability of digital tools and reinforced the idea that digitalisation enhances productivity.

The discussion brought to light the specific digital initiatives that participants encountered during their internships. These initiatives included process automation, the integration of modern collaboration tools such as Microsoft Teams and Slack, and the optimisation of scheduling through Google Calendar.

Valuable recommendations emerged from the participants, reflecting their understanding of how internship programs could better support digitalisation efforts within SMEs. Notably, there was a consensus on the need for more effective password management systems to enhance both security and ease of access to digital tools.

A prominent thread of discussion centered on the need of changing mindsets within SMEs, particularly among senior personnel who may exhibit resistance to digitalisation efforts. Participants viewed themselves as potential catalysts for change within organisations.

Some participants advocated for the development of standardised internship protocols aimed at fostering digitalisation. These protocols could encompass comprehensive guidelines for onboarding processes and mentorship structures, ensuring that interns are adequately prepared to contribute effectively to digitalisation initiatives.

The discussion concluded with valuable recommendations for enhancing internship programs to better support digitalisation efforts within SMEs. Participants proposed the establishment of effective password management systems to enhance security while simplifying access to digital tools.

The overarching message from the focus group discussion was the necessity of changing mindsets within SMEs to embrace digitalisation:

1. Organisational preparedness in terms of efficient onboarding and access to digital tools was deemed crucial.
2. Overcoming resistance to change, often prevalent among senior personnel, was recognised as a major challenge. The introduction of interns, with fresh perspectives, was suggested as a potential catalyst for change.
3. Some participants advocated for the development of standardised internship protocols aimed at fostering digitalisation. These protocols could serve as guidelines for onboarding and mentorship.

The insights garnered from this enriching focus group discussion significantly informed the subsequent development of the service design framework. They provide a practical foundation upon which strategies and recommendations for advancing digitalisation within SMEs can be constructed.

4.1.2 Using Interview Data

The interview analysis serves as the bedrock of this research endeavour, providing a comprehensive understanding of the intricate relationship between internship programs and digitalisation within SMEs. Adopting a qualitative approach, the interviews have yielded valuable insights that significantly inform the development of the service design framework.

Value of Internships in SMEs

One of the pivotal themes that emerged from the interviews is the multifaceted value that internship programs bring to SMEs in the context of digitalisation. The interviews emphasised several key aspects:

Skills Infusion: Across all interviews, a consensus was reached on the role of internships in infusing SMEs with fresh digital skills and knowledge. Interns serve as catalysts for innovation, injecting new ideas and technological know-how.

Academia-Industry Nexus: The interviews illuminated the crucial role of internship programs in bridging the gap between academic knowledge and its real-world application. SMEs benefit by staying updated with the latest digital trends, while students gain hands-on experience.

Talent Pipeline: Multiple interviewees highlighted the significance of internships as a pipeline for talent acquisition. Identifying promising interns who may eventually become long-term assets is a common outcome.

Digitalisation Challenges and Strategies

Another central theme explored in the interviews revolved around the challenges faced by SMEs in their digitalisation journeys and the strategies employed to overcome these hurdles:

Resource Limitations: Several interviewees emphasised the financial constraints that SMEs encounter when embarking on digitalisation. These constraints encompass budgetary limitations for technology adoption and employee training.

Change Management: The interviews underscored the necessity for effective change management. Resistance to adopting new technologies among employees can hinder progress, making it crucial to foster a culture of innovation.

Phased Digital Transformation: The interviews revealed a phased approach to digital transformation within SMEs. Initiating with foundational upgrades in infrastructure, SMEs gradually progress towards the implementation of more advanced technologies.

Role of Interns in Digitalisation

Interns were identified as instrumental players for the digitalisation of SMEs:

Agility and Fresh Perspective: Interviewees consistently praised the agility and fresh perspectives that interns bring to SMEs. Their adaptability to new technologies fosters a culture of experimentation and continuous growth.

Hands-on Learning: Internships were acknowledged as providing students with a valuable opportunity for hands-on learning, enabling them to apply theoretical knowledge to practical scenarios. This mutually beneficial learning experience contributes to both interns and host companies.

Project-Based Contributions: Specific examples were cited during the interviews wherein interns had made significant contributions to digitalisation efforts. These contributions ranged from process automation to digital marketing and data analytics projects.

Collaboration with Academic Institutions

The collaborative dimension of internship programs between SMEs and academic institutions was a recurring theme in the interviews:

Curriculum Alignment: The interviews stressed the importance of aligning academic curricula with the specific needs of SMEs. This alignment ensures that interns possess relevant skills and knowledge that can be readily applied.

Research Opportunities: Academic institutions were recognised as potential sources of research and innovation. SMEs can leverage university partnerships to explore emerging technologies and research avenues.

Resource Sharing: Some interviewees discussed the possibility of resource sharing, including access to software licenses and research facilities offered by universities.

Requirements in Internship Programs

The interviews candidly addressed challenges within internship programs:

Clear Expectations: Setting clear expectations from the outset of internships was consistently emphasised. This includes defining learning objectives and the scope of intern responsibilities to ensure alignment.

Internship Diversity: SMEs were advised to offer a variety of internship roles associated with different tasks and areas of expertise. Such diversity ensures a balanced approach to skill acquisition and development.

Documentation: The importance of interns submitting comprehensive reports or summaries of their work was highlighted. This documentation aids in knowledge transfer and facilitates informed decision-making.

The rich insights gleaned from the interviews significantly contribute to the development of the service design framework. These findings serve as the foundational knowledge upon which strategies and recommendations for advancing digitalisation in SMEs through effective internship programs be formulated.

4.1.3 State of the Art

In recent years, the digital transformation of SMEs has emerged as a critical imperative for sustaining competitiveness in the global market (Philbin et al., 2022). To achieve digitalisation effectively, a strategic approach involving the development of structured internship programs has gained prominence (BESSEYRE DES HORTS, 2019). This state-of-the-art review explores the key considerations and developments in the realm of internships promoting digitalisation in SMEs.

The impact of digitalisation on SMEs' international strategies has been a focal point of research (Alves, 2020). Understanding this impact is fundamental to framing internship programs that align with broader business objectives.

The digitalisation of SMEs is a key priority for the European Union, as SMEs are the backbone of the European economy. To support this goal, the EU has launched several initiatives, including the Digital Volunteers Pilot Programme (European Commission, 2021). This program brought together digital experts from large companies who work as mentors in SMEs to digitally upskill their employees and digitalise their business activities. The participation of more than 40 leading European companies was facilitated by cooperation between the European Commission and the Conseil de Cooperation Economique (European Commission, 2021).

The Digital Volunteers Programme aims at creating a wide network of European companies ready to support through their in-house experts the digitalisation of SMEs (European Commission, 2021). In this way, a global enhanced digital business environment beneficial to everyone will be promoted. Also, the Programme plays a key role in achieving the targets outlined in the Digital Decade: equipping at least 80% of EU citizens with basic digital skills and reaching 20 million employed ICT specialists by 2030 (European Commission, 2021).

The TURING project, part of the EIT Manufacturing initiative, represents a significant leap towards addressing the digital transformation of the manufacturing sector (*EITM Digital Upskilling and Reskilling Programme (TURING)*, n.d.). This initiative aims to promote digital transformation and sustainability within the industry. At its core, TURING is focused on digital upskilling and reskilling, aiming to equip individuals in the manufacturing industry with essential digital competencies (*EIT Labelled Fellowship – TURING Programme*, n.d.). This approach serves as a catalyst for digitalisation in SMEs by equipping

individuals with the skills needed for the digital manufacturing landscape. This project embodies the European commitment to fostering digital innovation and competitiveness in the manufacturing sector.

In conclusion, there are some initiatives and programmes in place to promote the digitalisation of SMEs through internships and mentoring. These programmes aim to create a network of support for SMEs and help them grasp the benefits of digitalisation. The ultimate goal is to create an enhanced digital business environment that is beneficial for everyone. This state-of-the-art review serves as a foundational exploration of the key components and developments in this critical field, offering a solid basis for further research and the development of effective internship frameworks.

4.2 Key Elements

Within the overarching topic of this research, the “Service Design Framework” holds a central role in guiding SMEs towards a successful digitalisation. This section delves into the specifics of this framework, focusing on the pivotal components that serve as its foundation – the key elements.

The significance of these key elements becomes evident when viewed in the context of the broader digital landscape. SMEs, often faced with resource limitations and resistance to change, require a strategic approach to harness the potential of digitalisation. This is where well-crafted internship programs come into play.

The exploration of these key elements is not just a theoretical exercise; it is a practical guide for SMEs aiming to thrive in the digital age. Insights have been extracted from engaging focus group discussions and in-depth interviews with those intimately involved in the intersection of internships and digitalisation. Additionally, a comprehensive review of the state of the art has been conducted to glean knowledge from existing initiatives and best practices. As going through these key elements, the focus is on uncovering the strategies and recommendations that SMEs can adopt to foster an environment of innovation and digital readiness. From designing internship programs that align with organisational objectives to addressing the challenges of resistance to change, these elements serve as beacons of guidance. Moreover, the exploration includes the role of interns as catalysts for change within SMEs, the collaborative opportunities with academic institutions, and the need for standardised protocols to streamline digitalisation efforts.

Each of these key elements plays an integral part in the larger narrative of this research. They form the very scaffolding upon which the Service Design Framework rests. By unravelling these elements in the subsequent sections, it is possible to envision the practical implications they hold and how, when woven together, they build a framework that empowers SMEs to embrace digitalisation effectively.

4.2.1 Internship Program Design

In the broader context of developing a service design framework, it is essential to recognise the pivotal role of successful internship programs within SMEs. These programs serve as a critical bridge for fostering digitalisation within SMEs. Drawing from insights gained through focus group discussions and interviews, several key elements emerge as crucial considerations when designing internship programs tailored to SMEs' digitalisation needs.

Efficient onboarding processes and seamless access to digital tools are foundational for effective internship programs within SMEs. Participants in the research emphasised the necessity for interns to experience a smooth transition into the digital environments of SMEs. This involves providing interns with the required access permissions, login credentials, and clear guidelines on how to use the digital tools integral to the organisation. The identified lack of redundancy in digital processes underscores the importance of streamlining access to data and applications. Interns should be equipped with the resources and permissions required to work efficiently, thus minimising delays or obstacles in their workflow.

A recurrent challenge within SMEs is the resistance to digitalisation efforts, often observed among senior personnel. The introduction of interns, with their fresh perspectives and tech-savvy backgrounds, has the potential to act as a catalyst for change. Organisations should strategise the effective integration of interns into their existing structures. This may entail mentorship programs where senior staff can guide interns while also benefiting from their digital expertise. Addressing the mindset shift toward digitalisation is critical for the success of internship programs. Encouraging open communication and collaboration between interns and experienced employees can foster a culture of innovation and drive digital transformation forward.

To ensure consistency and effectiveness in internship programs, the development of standardised internship protocols is advisable. These protocols should encompass comprehensive guidelines for onboarding processes, mentorship structures, and the definition of interns' roles and responsibilities. Standardising internship procedures enables SMEs to ensure that interns receive a consistent and valuable experience while contributing to digitalisation efforts. Clear expectations and well-defined internship roles can lead to more meaningful engagements and better outcomes for both interns and host organisations. These protocols can serve as a roadmap for SMEs to take advantage of the full potential of their internship programs in advancing digitalisation.

Interns often require access to various digital tools and systems. Ensuring effective password management is essential for both security and ease of access. SMEs must implement robust password management systems that not only enhance security but also simplify intern access to digital tools. Password security is a fundamental aspect of digitalisation within SMEs, and any breaches can have serious consequences. Therefore, investing in secure and user-friendly password management solutions should be a priority when designing internship programs.

As a result, the successful implementation of internship programs tailored to SMEs' digitalisation needs relies on several critical elements. These include efficient onboarding processes, strategies for addressing resistance to digitalisation, the development of standardized internship protocols, and a focus on secure and user-friendly password management systems. These elements collectively contribute to the effectiveness of internship programs in fostering digitalisation within SMEs, bridging the gap between theory and practice, and driving organisational innovation.

These key elements collectively form the basis for strategically designing internship programs within SMEs, ensuring that they are well-positioned to navigate the challenges and opportunities of digitalisation. In the subsequent sections, these elements will be explored in more detail, offering insights and recommendations for effective implementation within SMEs' internship initiatives. These insights will be instrumental in

shaping the service design framework, providing practical foundations upon which strategies and recommendations for advancing digitalisation within SMEs can be constructed.

4.2.2 Digitalisation Strategies

In the context of developing a comprehensive service design framework, it is essential to highlight the central role that digitalisation strategies play for SMEs. According to significant research, these approaches are essential for enabling SMEs to not only adapt but also thrive in the modern digital economy.

Internship programs provide a strategic route by which SMEs can easily integrate digital advancements into their operations. It becomes clear how interns can act as catalysts for innovation. They give SMEs a competitive advantage in the rapidly changing digital landscape by providing them with innovative ideas, technological know-how, and a digital-first attitude. Significantly, this skill infusion persists throughout the internship time and becomes a permanent force for digital advancement within the company.

Moreover, interns also act as a crucial talent pipeline for SMEs. Long-term gains can result from identifying and supporting promising interns. Many interns develop into valued workers with the appropriate direction, ensuring the continuance of digitalisation initiatives. Internship programs provide SMEs with a low-risk, cost-effective method of finding and retaining outstanding talent.

A greater emphasis is placed on the critical role that internship programs play in bridging the gap between theoretical knowledge and real-world application. The expertise and insights that interns bring from their academic backgrounds are extremely beneficial to SMEs. Their adaptability and fresh perspectives consistently invigorate SMEs, fostering a culture of experimentation and continual improvement—qualities crucial for successful digitalisation endeavours. Because of the mutually beneficial partnership between academia and industry, SMEs can access the newest digital trends and best practices. The development of internship programs that are tailored to the demands of SMEs prepares the way for a consistent flow of well-educated interns eager to spearhead digitalisation projects. This mutually beneficial learning experience contributes to both interns' personal development and the SMEs digitalisation goals.

Nonetheless, the journey of digitalisation has its challenges, as uncovered throughout the research. Strategic solutions are required for problems including limited resources, opposition to change, and the need for a phased approach to digitalisation. SMEs may overcome financial restrictions with the help of good planning, prioritised investments, and cost-effective solutions. While to overcome opposition to new technology, an innovation-friendly culture and open lines of communication must be fostered. At the same time, a gradual approach to digital transformation reduces the risks related to quick changes.

Therefore, collaboration between SMEs and academic institutions can help overcome these challenges and bring benefits to all the parts included. Resource-sharing possibilities, such as access to software licenses and research facilities provided by universities, provide cost-effective pathways for SMEs to leverage academic partnerships.

In conclusion, the success of internship programs hinges on offering a diverse range of roles spanning various tasks and areas of expertise. This diversity guarantees that skill development and acquisition take a well-rounded approach. A successful internship

experience depends on having clear expectations and thorough recording of interns' performance. A way of facilitating knowledge transfer and informed decision-making is by encouraging interns to furnish comprehensive reports or summaries of their work facilitates. Additionally, these intertwined digitalisation initiatives serve as the foundation for SMEs' attempts to survive and prosper in the digital era. The strategies that were mentioned are further examined in following sections, along with insights and suggestions for how they can be successfully incorporated into SMEs' digitalisation projects.

4.3 Framework Adaptation

This section refines the service design framework by integrating insights obtained from the focus group discussions and interviews. These insights provide a deep understanding of the intricate relationship between internship programs and digitalisation within SMEs.

4.3.1 Alignment with Focus Group Insights

The focus group discussions uncovered crucial challenges faced by interns during their period in SMEs, shedding light on the obstacles that often hinder efficient digitalisation efforts within these enterprises.

Table 2- Key Challenges Encountered by Interns

Challenges	
Lack of redundancy in digital processes	“Digital processes lacked backup or redundancy, making it risky in case of failures or data loss.”
Communication Tools	“Inadequate communication tools, such as Microsoft Teams, hindered efficient team communication during internships.”
Data confined within personal accounts	“A common challenge is the confinement of crucial business data within personal accounts, leading to fragmentation and inefficiency.”
Digitalisation Discrepancy	“There was a disconnection between digital and physical operations, especially in managing documents such as invoices.”
Locally installed software applications	“Certain software applications are still locally installed on company computers, requiring the involvement of intermediaries within the organisation.”
Difficulties in accessing necessary work tools	“Access issues, including delays in VPN access and difficulties in accessing necessary work tools, are common pain points.”
Resistance to Remote Work	“Some companies are resistant to remote work, limiting flexibility and digital collaboration opportunities.”

To address these challenges effectively, the adapted framework places strong emphasis on the need for efficient onboarding processes and seamless access to digital tools. These aspects are foundational for successful internship programs within SMEs. Participants in the research stressed the need for interns to experience a smooth transition into the digital environments of SMEs. This involves providing interns with the required access permissions, login credentials, and clear guidelines on how to use the digital tools integral to the organisation. The identified lack of redundancy in digital processes underscores the importance of streamlining access to data and applications. Interns should be equipped with the resources and permissions required to work efficiently, thus minimising any delays or obstacles in their workflow.

Table 3- Strategies for Overcoming Resistance to Digitalisation

Suggestions	
Improve Onboarding Process	“Companies need better organisation to welcome interns.”
Implement Established Communication Systems	“Especially now, in the era of digitalisation, it doesn't make sense to have so many errors.”
Promote Change Management Processes	“The key points are the lack of resources and resistance to change from managers. Internships invigorate companies and bring different perspectives, eliminating outdated processes and providing a foundation.”
Modernise Systems and Data Entry Processes	“I think it's all about resistance. It's very difficult to implement change if the actors of change don't want to change.”
Fostering a culture of innovation	“Encouraging open communication and collaboration between interns and experienced employees can foster a culture of innovation.”
Enhance Password Management	"One key area where we can make improvements in internship programs for digitalisation efforts is by addressing password management. During my internship, I noticed that there were issues with password policies, and this caused delays and security concerns. We need more streamlined and secure methods for managing access credentials."

Additionally, participants advocated for the development of standardised internship protocols, a key element now emphasised in the framework. These protocols should encompass comprehensive guidelines for onboarding processes, mentorship structures, and

the definition of interns' roles and responsibilities. Standardising internship procedures enables SMEs to ensure that interns receive a consistent and valuable experience while contributing to digitalisation efforts. Clear expectations and well-defined internship roles can lead to more meaningful engagements and better outcomes for both interns and host organisations. These protocols can serve as a roadmap for SMEs to harness the full potential of their internship programs in advancing digitalisation.

4.3.2 Integration of Interview Findings

The adaptation of the framework for internship programs in SMEs is rooted in a deep understanding of the intricate dynamics, challenges, and opportunities presented by these unique enterprises. Interviews conducted with industry professionals provided valuable insights that have been thoughtfully incorporated into this framework. Here, we delve further into these findings, citing specific interview excerpts to underscore of the analysis.

Table 4- Benefits of Internship Programs in SMEs

Benefits	
Knowledge Transfer and Skill Development	“Internships offer students the opportunity to gain practical experience in a real workplace, allowing them to apply their theoretical knowledge in a practical setting.”
Access to Innovative Ideas	“Interns bring fresh ideas and perspectives to the company, which can lead to innovation and process improvements.”
Customer-Centric Focus	“Interns can assist SMEs in understanding customer needs and preferences in the digital age, facilitating better customer-centric strategies.”
Continuous Learning	“Staying updated and continuously learning is essential for SMEs. Interns can contribute to this learning process, ensuring SMEs remain current with technological advancements.”

While these benefits were consistently acknowledged, the interviewees also revealed that their realisation could be influenced by various factors such as the industry type, the structure of the internship program, and the size of the SME.

Table 5- Challenges of Internship Programs in SMEs

Challenges	
Attracting Interns	“Attracting interns, especially in competition with larger companies, can be challenging for SMEs.”
Lack of Digital Knowledge	“SMEs often lack the digital knowledge and expertise needed to make the most of internships.”
Limited Resources	“SMEs often face resource constraints when it comes to providing extensive training and mentorship.”

Retention Difficulties	“Retention of interns can be a challenge, as they might seek full-time positions elsewhere.”
Skill Mismatch	“Matching interns' skills with SMEs' specific needs can be tricky.”
Market Competition	“SMEs face competition not only from similar businesses but also from unexpected sources.”
Adaptation to SME Culture	“Interns play a crucial role in our organisation, but to excel in their roles, they must swiftly adapt to our unique company culture, embracing our values, work ethics, and collaborative spirit.”

The synthesis of these benefits and challenges, gleaned from interviews with industry experts provides a robust foundation for this adapted framework for SME internship programs. This framework not only addresses the practical needs of SMEs but also caters to the distinct nuances and considerations that characterise these enterprises. The tables above encapsulate the key points drawn from these interviews, ensuring that the insights are both specific and substantiated by direct interview citations.

4.4 Visual Representation of the Framework

In this section, it is presented a visual representation of the service design framework for internship programs discussed in the previous chapters. Visualising complex concepts and strategies is instrumental in enhancing understanding and facilitating effective communication.

This visual representation aims to capture the essential components, problems, solutions, advantages, vision, impact, and management features of the framework. With the help of this visual medium, the aim is to provide a succinct yet thorough overview of how SMEs can strategically use internship programmes to succeed in the digital age.

The conceptual framework provided captures the key elements and challenges in creating internship programmes for Small and Medium-sized Enterprises (SMEs) in the digital era. The incorporation of these principles into service design tools is crucial to turning this framework into a helpful resource for developing such programmes, ensuring a smooth transition from concept to implementation.

The idea of a user-centered design process is at the foundation of this integration. It is essential to employ an approach based on empathy and understanding to make sure that the internship programme caters to the unique requirements and expectations of the involved interns. A wide range of technologies available in-service design, like empathy mapping and persona building, can provide important insights about the preferences and goals of interns. In turn, this gives the programme the ability to effortlessly align itself with the professional aspirations of interns while keeping a close eye on the SME's strategic goals.

In an era that is heavily influenced by technology, strategically integrating digital technologies becomes indispensable. Digital technology integration is encouraged by service design to promote seamless training, communication, and collaboration. Aside from enhancing the internship experience, embracing tools like digital communication

platforms, e-learning courses, and project management software also helps interns build their digital competencies more quickly.

The service blueprint shows up as an essential tool to explore further into this integration. It changes into a dynamic instrument that locates bottlenecks, enhances workflows, and guarantees uninterrupted operations. The comprehensive examination of service design includes both the intern's journey, where skills are developed, and operational efficiency, where systems are optimised for maximum performance. The key to seamless integration is this all-encompassing strategy, which guarantees that the program's operational excellence and interns' experiences are given equal priority.

Cross-departmental and stakeholder collaboration is essential for effective service design. Therefore, in the context of designing an internship programme, this calls for active participation from interns as well as management and staff. Engaging all stakeholders ensures that the programme provides significant value for everyone, which is ideally aligned with the co-creation and inclusion principles of service design.

Moving forward, service design concepts guide the journey towards mutually advantageous results as the integration takes form. The creation of the user experience (UX) involves striking a delicate balance between maximising the learning opportunities for students and providing the SME with real value. To achieve this balance, one must have a thorough awareness of the developmental objectives of interns as well as the strategic priorities of the SME. This balance is achieved through service design, where the programme is tailored to support both skill development and strategic business goals.

A successful internship programme is built on a long-term, scalable plan. This strategy includes locating funding sources, defining stakeholder responsibilities, and creating a transparent communication strategy. These strategic elements are organised and defined using techniques for service design, such as journey mapping and service prototyping, to ensure long-term viability.

Additionally essential is a seamless adherence to the SME's digitalisation plan. This calls for a thorough grasp of the SME's digitalisation objectives as well as the identification of the required digital competences. By doing this, service design techniques direct the formulation of these goals and lay out the specific actions required to accomplish them.

The incorporation of a co-design perspective on data in the context of internships for SME digitalisation offers enormous promise too. This novel strategy promotes group data-driven decision-making and enables SMEs and interns to successfully use data insights. It promotes an innovative and adaptable culture that perfectly complements the dynamic character of SME digitalisation initiatives.

In summary, the combined use of framework elements with tools for service design redefines how internship programme design can be conducted within SMEs. With these strategies deeply ingrained, the systematic method ensures that programs foster interns' digital abilities and significantly advance the organisation's digitalisation process. This comprehensive integration represents a significant development in the rapidly changing SME digital transformation scene, opening the door for more research and invention in this important field.

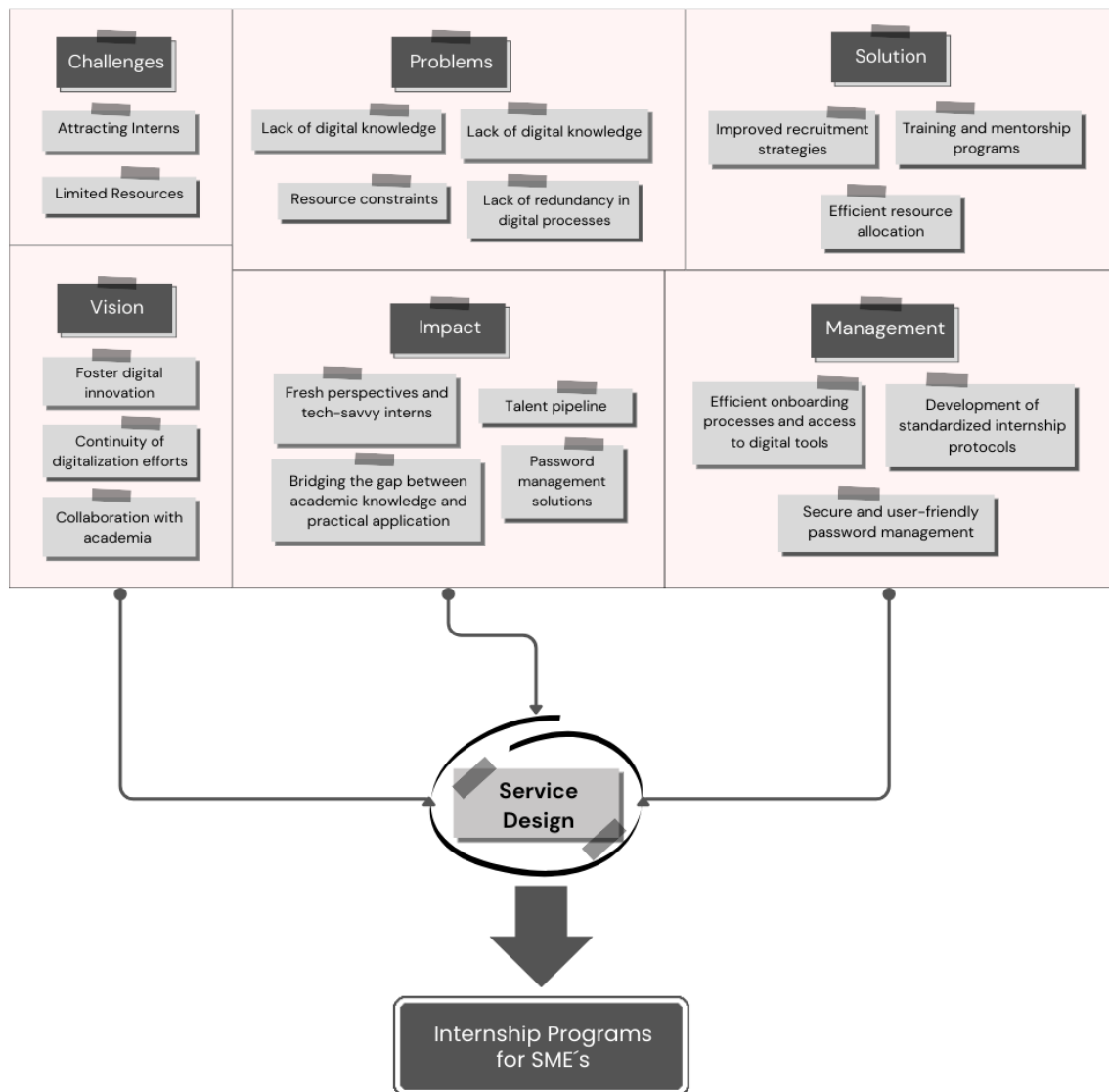


Figure 3- Service Design Framework for Internship Programs

5 Discussion

5.1 Framework Evaluation

An assessment of the service design framework is provided in this section. It was investigated how the framework fits with the research objectives and how SMEs might use it in practice. The goal is to fully comprehend how the framework fits with the goals of the study and how it might be used in actual SME situations.

5.1.1 Alignment with Research Questions

Research Question 1: What are the possible formats for internship programs within SMEs?

The first research question investigated possible internship programme formats in SMEs and how they could be adapted to support digitalisation initiatives. The study has provided thorough explanations for answering this question. It has examined the essential elements that characterise these forms, putting a focus on efficient internship programme design. These procedures play a crucial role in ensuring that interns integrate seamlessly into the digital environments of SMEs. The research also emphasises the importance of giving interns the necessary access permissions, login information, and clear instructions for using the digital tools essential to the organisation.

These multifaceted components work together to identify various internship programme formats that might significantly improve digitalisation efforts within SMEs.

Internship programs such as project-based internships, virtual internships, rotational internships, and experiential learning have become critical instruments for advancing digitalisation in SMEs. These formats each have particular benefits to offer. Regardless of the chosen format, successful internship programs for digitalisation in SMEs consistently emphasise mentorship and continuous learning.

These formats not only provide practical insights into supporting digitalisation initiatives but also integrate service design principles, enhancing the alignment of the research performed with this research question. The discussion reflects how these formats can be adapted to meet the specific needs of SMEs and contribute to their successful digitalisation efforts.

Research Question 2: What are the key components of a framework for SMEs aiming to enhance digitalisation through internships?

A complete framework for SMEs wanting to improve their digitalisation through internships was sought in the second question. The conclusions are perfectly consistent with this question. They not only point out these key elements but also emphasise their crucial functions within the framework. According to the research, a holistic framework includes a few elements, such as the development of successful internship programmes, clearly defined digitalisation goals, partnerships with academic institutions, and the adoption of uniform internship norms. Each of these elements is crucial to SMEs' efforts to boost digitalisation through internship programmes. Effective programme design, for instance, makes sure that interns are effortlessly included into digital workflows, and digitalisation plans provide SMEs a disciplined way to make the most of interns' efforts.

Research Question 3: How can service design principles enhance digitalisation efforts in SMEs through internships?

The research indirectly tackles the application of service design concepts in increasing digitalisation initiatives within SMEs through internships. In particular, the study emphasises how crucial it is to provide interns an organised, user-centric experience that adheres to service design standards. The research significantly enhances the whole internship experience by addressing issues such as effective onboarding and simplifying access to digital resources. Indirectly, this encourages the use of service design concepts to enhance user experiences. In this situation, the study indirectly advances digitalisation in SMEs by using the principles of service design, even though that is not its major goal.

Comprehensive results that closely match the main research topics have come from this study. A holistic framework's essential elements, critical components, and the implicit incorporation of service design concepts are all provided as comprehensive insights into alternative internship programme designs. Through the judicious use of internships, these findings help to strengthen digitalisation efforts inside SMEs.

5.2 Contributions and Limitations

In this crucial section, it is explored the strengths and weaknesses of this research, enlightening its implications for the discipline of service design as well as the practical approaches used by SMEs looking to advance their digitalisation initiatives. The service design framework defines steps and has the power to alter industries, but it can also be recognised its limitations and open possibilities for further research. The purpose of this section is to reflect on the significance of the research and its implications for SMEs as they pursue digital excellence. The full worth and possibilities of this research are revealed within these contributions and constraints, offering insightful information to both academics and practitioners in the field.

5.2.1 Contributions to Service Design

This research makes substantial and varied contributions to the field of service design, especially in the context of SMEs aiming to improve their digitalisation efforts. These contributions are essential to the development of the area of service design and have the potential to influence the real-world strategies used by SMEs.

The development of a service design framework that is specifically customised to the special environment of SMEs is one of the main contributions of this research. This framework provides SMEs with a methodical and practical way to advance their digitalisation efforts. In addition to identifying and addressing the significant difficulties and issues faced by SMEs, it also offers concrete and workable answers and tactics. This framework offers SMEs a comprehensive blueprint to streamline their digitalisation activities and integrates smoothly with service design principles.

According to the fundamental principles of service design, this research emphasises user-centricity and comprehensive problem-solving. These principles are well aligned with the framework's emphasis on the value of effective onboarding procedures, the facilitation of easy access to digital resources, and the successful integration of interns into the organisational structure. To co-create solutions that are specific to their requirements and

objectives, it guarantees that SMEs actively engage with their users, including interns and other stakeholders within the SMEs.

The study emphasises how important it is for SMEs and academic institutions to work together. This partnership goes beyond established limits, acting as a strong link between theoretical knowledge and real-world application, as well as a way to find new talent and creative ideas. It increases the synergy between academia and business, enhancing both fields with reciprocal learning and insights by bridging the theoretical-practical gap. In doing so, it embodies the philosophy of service design, which emphasises the role of interdisciplinary collaboration in the creation of value.

The persistent search for innovation is at the heart of service design. This framework deliberately places interns as change agents that encourage an innovative culture within SMEs. Their innovative thinking, technological skills, and focus on the digital world make them a powerful force for change and adaptability. This framework upholds the core principles of service design, which centre on continuously finding new ways to improve and innovate services. It does this by establishing an environment where experimentation is encouraged, and continuous improvement is embraced.

5.2.2 Implications for SMEs

It is critical to recognise that, despite its merits, this research has some limitations. While these limitations do not diminish its relevance, they do serve as critical focal points for future research and practical applications.

Constraints created by insufficient resources remain a persistent concern for SMEs. While the paradigm offers nuanced answers for optimal resource allocation, the underlying issue of resource scarcity remains complex and multidimensional. The difficulty arises in reconciling aspirations with available resources.

The framework's adaptability and versatility are inherent characteristics. However, it is critical to recognise that the success of its application may vary depending on the specific environment of an SME. Variations in industry, size, organisational structure, and digital maturity can all have a substantial impact on the framework's effectiveness. As a result, SMEs are encouraged to modify the framework to their situations and needs.

The digital landscape is dynamic, i.e., it is always changing due to rapid technology improvements. While the framework has been rigorously created to be forward-thinking, it may require frequent updates and adjustments to remain relevant and effective in the face of evolving technology and paradigms.

SMEs can use the framework strategically to map their digitalisation journey. It not only helps them navigate the complex digital context, but it also provides them with a base framework for turning obstacles into opportunities. SMEs can effectively attract tech-savvy interns who not only contribute to innovation during their internships but also serve as a potential talent pipeline by connecting their internship programmes with digitalisation aims. Nurturing bright interns can lead to the retention of top-tier talent, ensuring that digitalisation efforts continue indefinitely.

The framework encourages SMEs to incorporate elements of service design thinking into their digitalisation plans. SMEs may provide solid foundations for long-term digital success by focusing on user-centred solutions and comprehensive methods.

In that way, this adds a crucial chapter to the service design discourse, particularly in the complex domain of SME digitalisation. While acknowledging its limits, this study sets the path for further investigation and practical application of service design in the ever-changing arena of SME digitalisation.

6. Conclusion

6.1 Summary of Findings

This extensive literature study delves into the complex environment of SME internship programmes, with a special emphasis on identifying important framework components. We discovered useful insights that enlighten the main aspects contributing to the success of such programmes through a comprehensive review of scholarly articles and research papers.

One of the review's main results is the identification of critical components within SME internship frameworks. These components cover a broad range of structural and strategic features. They range from essential building elements like mentorship, curriculum creation, and evaluation procedures to advanced digitalisation integration activities.

Furthermore, the research has demonstrated the substantial influence that well-structured internship programmes may have on SMEs' digitalisation initiatives. Interns and SMEs can both gain benefit from incorporating digital tools and technology into the internship experiences. This strategy provides interns with real-world digital skills while also preparing SMEs to overcome the difficulties of the digital age more successfully.

Moreover, applying service design concepts has emerged as a highly viable path for boosting digitalisation through internships. SMEs can modify their internship programmes to better correspond to the requirements and expectations of both interns and the organisation by adopting a user-centric, holistic perspective. As a result, the internship experience becomes smoother and more productive, resulting in actual digitalisation achievements.

6.2 Future Research Directions

6.2.1 Prospective Studies on Framework Implementation

This section highlights the possibilities for further study in the field of SME internship programmes. While the literature provided useful insights into the important framework components, it also emphasises the importance of conducting prospective studies with a focus on practical application. Future efforts should focus on empirical examination, impact quantification, and longitudinal studies.

Empirical research entails performing studies that provide real-world insights into how SMEs implement the defined framework components. This entails watching and analysing how various SMEs tailor their internship programmes to these components. Researchers should investigate the difficulties and successes encountered during the implementation process.

Impact quantification is essential for moving beyond qualitative insights and quantifying the impact of certain strategies and components on SME digitalisation efforts. This includes assessing connections between internship programme aspects and actual indicators such as revenue growth or efficiency improvements, as well as measuring outcomes such as interns' improved digital skills as a result of participation in well-structured programmes.

Longitudinal studies are critical for understanding the long-term viability and benefits of well-designed internship programmes. These studies can track the digitalisation progress of SMEs over time, providing insights into how digitalisation initiatives evolve within SMEs after an internship programme. They might also investigate if interns' digital skills continue to affect their careers and contributions to SMEs.

Following that, future studies on framework implementation hold great promise for furthering our understanding of the influence of SME internship programmes on digitalisation. By delving into these areas, researchers may provide essential insights that aid SMEs in their digitalisation efforts while also contributing to the larger landscape of digital transformation.

6.3 Closing Remarks

Finally, this research emphasises the critical need for a well-designed framework for SME internship programmes in driving digitalisation efforts. The findings presented in this research not only provide a framework for additional academic investigation, but also provide essential advice for SMEs attempting to optimise their internship programmes in the dynamic landscape of the digital era.

As SMEs continue to play an important part in the global economic environment, digitalisation through successful internship programmes becomes a strategic requirement for growth and innovation. When cultivated through a strong framework, the symbiotic relationship between SMEs and interns has the potential to catalyse digital change and contribute to the long-term sustainability and competitiveness of SMEs.

Finally, it is aimed that this research will serve as a beacon, guiding both scholars and practitioners towards a brighter and more digitally empowered future for SMEs and the interns who shape and will continue to shape them.

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8. Appendix

8.1 Appendix 1- Final Script of the Interview

Duração: 35'

Apresentação: O

meu nome é Sofia Silva e estou neste momento a desenvolver a minha dissertação e a frequentar o segundo ano no Mestrado em Engenharia de Serviços e Gestão (MESG) na Faculdade de Engenharia da Universidade do Porto.

Enquadramento:

Esta entrevista está enquadrada na minha dissertação de mestrado, que tem como tema: a promoção da digitalização em pequenas e médias empresas através de estágios.

Objetivo:

O objetivo deste estudo consiste em investigar e compreender de forma aprofundada as perceções, experiências e práticas das Pequenas e Médias Empresas (PMEs) no que diz respeito à utilização de estágios como estratégia para impulsionar a digitalização das suas empresas. Pretende-se identificar os desafios que as PMEs enfrentam ao implementar programas de estágio com enfoque na digitalização, bem como as oportunidades e melhores práticas que emergem destas experiências. Através destas entrevistas pretende-se criar um quadro completo que contribua para a compreensão das dinâmicas subjacentes à integração de estágios como componente fundamental da estratégia de digitalização destas empresas, daí o vosso contributo ser tão importante, dada a vossa experiência.

Questões:

1. Pode dizer-me qual é a sua profissão e formação?
2. Pode-me descrever a sua experiência no desenvolvimento e implementação de programas de estágio
 - 2.1 Como é que considera que estes programas tenham sido úteis para os estudantes e para as empresas envolvidas?
3. Como é que sugere que os estágios possam ser estruturados para promover esta digitalização nas PMEs?
 - 3.1 Como é que considera que sejam os elementos essenciais, que são considerados para programas de estágios, para serem bem-sucedidos, neste caso, mais voltado para a digitalização?
4. E do ponto de vista do estagiário? Como é que o estágio em si pode vir a ajudar nessa promoção da digitalização na empresa? Por exemplo, novas tecnologias, novas ferramentas/ conhecimentos que trazem.
5. Quais é que podem ser considerados os desafios mais significativos que as PMEs possam enfrentar quando tentam implementar a digitalização?
 - 5.1 De que forma é que os estágios podem ajudar a ultrapassar estes desafios? Se quiser, pode dar algum exemplo.

6. Tem alguma experiência de um programa de estágios que tenha sido bem sucedido (uma success story) e se formos mais específicos, neste caso, que tenha promovido até a digitalização?
 - 6.1 Sendo assim, quais é que considera que possam ter sido os principais elementos, que contribuíram também para o sucesso, neste caso?
7. Que métricas utilizam, ou costumam utilizar, para avaliar o sucesso destes programas de estágio?
8. Como é que se pode garantir que os estagiários adquirem, tanto competências, como conhecimentos práticos, na promoção da digitalização que, podem vir a aplicar, por exemplo, nas suas carreiras futuras?
9. Que papel devem desempenhar as instituições académicas no apoio às PMEs na promoção da digitalização, através dos estágios? Portanto, que riscos devem evitar e que estratégias devem dar prioridade?

8.2 Appendix 2 – E-mail Script

Boa tarde, (nome)

O meu nome é Sofia Marques Silva e, no âmbito da realização da dissertação do Mestrado em Engenharia de Serviços e Gestão na Faculdade de Engenharia da Universidade do Porto (FEUP), venho por este meio solicitar a sua colaboração através da realização de uma breve entrevista no âmbito do meu projeto de investigação “Promoting Digitalisation in SMEs through Internships: Developing a Service Design Framework”.

O objetivo da nossa conversa é ouvir a sua experiência e perspetiva sobre o processo de estágios que promovam a digitalização em Pequenas e Médias Empresas (PMEs). Pretendo também entender o que pode ser adotado para tornar esses estágios efetivos na promoção da digitalização nas PMEs e quais os benefícios que podem ser obtidos ao participar neste tipo de programa. Além disso, também tenho interesse em perceber os desafios que as PMEs enfrentam ao implementar a digitalização.

A entrevista será em formato online e terá uma duração aproximada de 30 minutos.

Para facilitar o tratamento dos dados, peço a sua autorização para efetuar a gravação da mesma através de um consentimento informado, que disponibilizo em anexo. Peço para verificar o documento quando tiver a oportunidade. Caso esteja de acordo, por favor, assine e envie o mesmo assinado.

Neste sentido, solicito que me informe se teria disponibilidade para realizar a entrevista num destes dias a um horário à sua escolha:

3ª feira / 1 de agosto

4ª feira / 2 de agosto

6ª feira / 4 de agosto

Será extremamente relevante conhecer a sua perspetiva e experiência, pelo que agradeço, desde já, a sua atenção. A sua opinião é particularmente importante, considerando a vasta experiência profissional que possui.

Qualquer questão que tenha, deixo os meus contactos abaixo para que o possa esclarecer.

Atenciosamente,

Sofia Marques Silva

ssofiasilva99@gmail.com

939 259 384

8.3 Appendix 3- Informed Consent



Consentimento Informado

Eu, _____ aceito participar de livre vontade no estudo da autoria da estudante Sofia Marques Silva, orientada pelo professor José Coelho Rodrigues, no âmbito do projeto de investigação "Promoting Digitalisation in SMEs through Internships: Developing a Theoretical Service Design Framework" pela Faculdade de Engenharia da Universidade do Porto.

Foram-me explicados e compreendo os objetivos principais deste estudo. Entendi e aceito responder a uma entrevista que explora questões sobre o processo de estágios que promovam a digitalização em Pequenas e Médias Empresas (PMEs).

Compreendo que a minha participação neste estudo é voluntária, podendo desistir a qualquer momento, sem que essa decisão se reflita em qualquer prejuízo para mim.

Permito que a entrevista seja gravada de forma a poder ser referenciada no processo em estudo, podendo revogar a permissão a qualquer momento.

Entendo que a informação recolhida neste estudo é estritamente confidencial e será apenas utilizada no âmbito do mesmo. Entendo, ainda, que a minha identidade nunca será revelada em qualquer relatório ou publicação, ou a qualquer pessoa não relacionada diretamente com este estudo, a menos que eu autorize por escrito.

Assinatura do investigador: _____ Data __/__/__

Assinatura do entrevistado: _____ Data __/__/__

Contacto do investigador:

Sofia Marques Silva

Mestrado em Engenharia de Serviços e Gestão

Faculdade de Engenharia da Universidade do Porto

E-mail: ssofiasilva99@gmail.com | sasilva@ubiwhere.com

Telemóvel: +351 939 259 384