UiA University of Agder

Master

Cross-functional teams in Digital transformation projects

What are the benefits and challenges of using cross-functional project teams in digital transformation projects?

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Preface

This group consist of August Fløgstad and Håkon Bore Haaland, and from the beginning of forming the group we agreed on focusing the thesis regarding the topic of digital transformation. We both have a general interest of the topic due to its relevance in the current working environment. When our supervisor Andreas Erich Wald suggested the topic of project work in digital transformation projects our interest was piqued. Project work is a frequently used practice to handle complex problems related to different types of processes, which again ties well together with our interest in digital transformation. After a thorough literature review, we were introduced to the use of cross-functional teams in digital transformation projects, which suited us well, forming a good research question.

We would like to express our gratitude to everyone contributing and supporting us throughout the process of writing this thesis. A sincere thank you to our supervisor Andreas Erich Wald for his contribution, guidance and constructive criticism. In addition to our supervisor we would like to thank friends and family who has also contributed to improve the thesis by proof-reading and putting us in contact with candidates for interviews. Lastly a big thank you to everyone who took their time to attend interviews, providing us with valuable insight, opinions and perceptions on the relevant topic.

Abstract

Digital transformation and the use of digital solutions have become more and more important for organizations in recent years, both to make existing processes more effective and to establish competitive advantage. The topic was chosen following a comprehensive literature review regarding project management, where the use of cross-functional teams appeared to be a common challenge. The topic of cross-functionality turned out to be especially interesting due to its relevance in digital transformation projects, where IT-developers need to cooperate with people of different backgrounds and ways of thinking. The aim of the thesis was therefore to answer the question of how cross-functional teams' function in digital transformation projects and explore to find "best practice". More precisely the following research question was developed: ***What are the benefits and challenges of using cross-functional project teams in digital transformation projects?***

There is some existing literature regarding the use of cross-functional teams, but without specific focus on digital transformation projects. This study intends to contribute to the research field by providing first-hand understanding of the challenges and benefits experienced by professionals working with this specific type of projects in these kinds of teams.

Five interviews were conducted with practicing professionals representing every part of a cross-functional team working with digital transformation. The transcripts were analyzed, and key success factors, benefits and challenges were identified. Most of these key success factors are related to clear communication, getting all members on the same page and being proactive early on in the planning phase. These findings have been summarized in a framework for the use of cross-functional teams focusing on digital transformation projects. However, the findings suggest that although all the interviewees have experience from digital transformation projects, the framework could also be applicable to other types of projects. This indicates that the use of cross-functional project teams can also be necessary in projects not concerning digital transformation.

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1. Introduction

In order for companies to keep up and take part in the ongoing technological and digital revolution, they are all relying on effective and precise methods to implement new digital solutions, often through projects using cross-functional teams (Bishop, 1999). Generally, the intentions of these types of projects are to boost productivity and improve already existing processes. This transformation often refers to changes on several organizational levels, such as process level, organization level, business domain level and society level (Päivi, Maarit, Jukka, & Susanna, 2017). The rapid change and diffusion of technology has intensified the need for teams being able to manage complex and unique projects, making the use of cross-functional teams more relevant and important than ever (Hsieh, 2010).

Managing a project concerning implementation of new technology and digital solutions will vouch for a new way of processing and project management. While projects about construction work often is planned with precise details for costs, work force and time schedule before even starting, IT implementation projects, software development or development of new products or services often has a more diffuse and uncertain approach to timeline, costs and staffing.

The use of cross-functional teams has become more important in project-work, especially when concerning digital transformation and digital solutions in order to optimize resource use (Love & Roper, 2009). This includes facilitating knowledge integration and exchange, hierarchical challenges and cultural difficulties. The aim of this thesis is to research the critical success factors, benefits and potential pitfalls when using cross-functional project teams in digital transformation projects.

1.1 Research question

The research question is based on challenges mentioned in relevant literature (Ghobadi & D'Ambra, 2012; Shivakumar, 2018; Wysocki, 2019). A common challenge for project managers will be to identify skill set gaps and adapt to and overlap these by developing teams utilizing every members' skill sets and experience. For a team to work efficiently, resource deployment and well-balanced teams are crucial. Furthermore, the project manager must provide the big picture to all team members across departments, in order for them to understand their role in the project and the end goal. To establish this common understanding,

clear channels of communication and collaboration must be recognized (Shivakumar, 2018). The impression is that the bridge between cross-functional teams and digital transformation projects is due to the extent of dependency on other experts in this type of projects, compared to other types of projects (Holland, Gaston, & Gomes, 2000). Even though this, due to digital transformation, arguably is more relevant than ever, it turned out to be quite difficult to find studies focusing on cross-functional teams with regards to digital transformation projects.

Therefore, the aim of our research is to further explore how cross-functional teams work with projects concerning digital transformation. Hence, this thesis will address the following research question:

- *What are the benefits and challenges of using cross-functional project teams in digital transformation projects?*

The approach to our research is illustrated in the figure beneath.

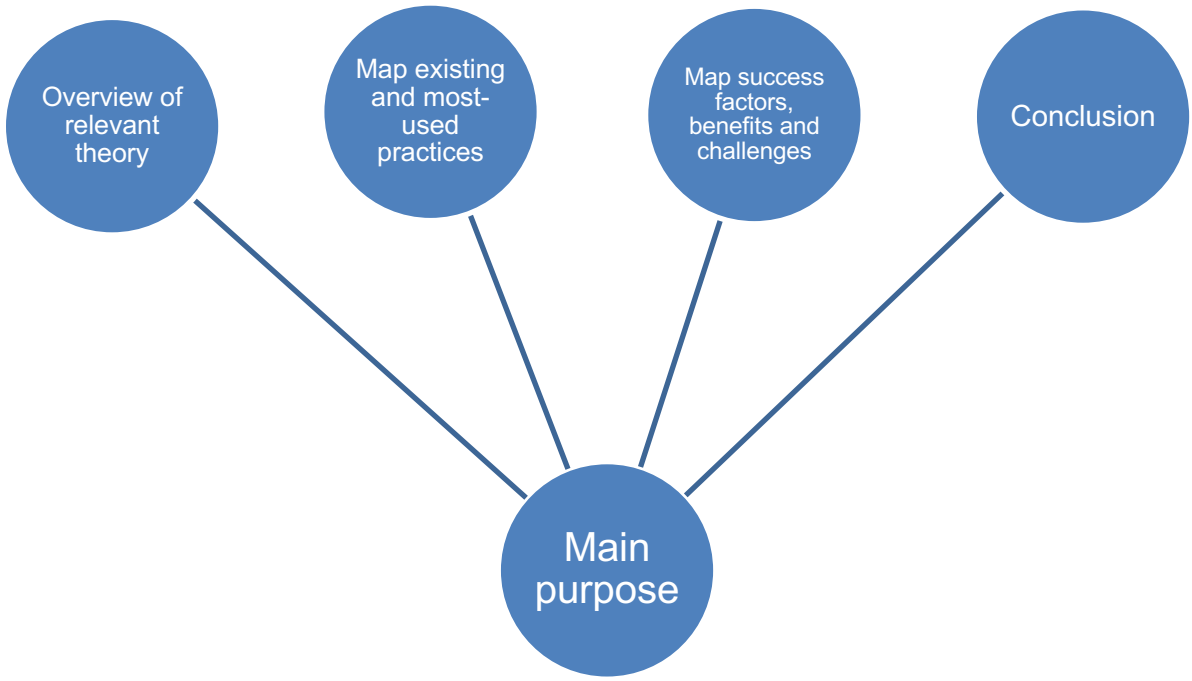


Figure 1: Main purpose of study

1.2 Thesis outline

The thesis is built up of six different parts; Introduction, theoretical background, methodology, results, discussion and conclusion. In order to fully understand the concept of project work, the theoretical background chapter will include information regarding traditional and agile approaches to project work and are sequenced and described in the chapters 3 through 6. Chapter 3 describes which type of methodology is used in the research. Chapter 4 presents and categorizes the data gathered throughout the interviews conducted. In chapter 5 the collected data will be compared to existing data on the relevant field, most of it already presented in chapter 2. The goal of chapter 5 is to map out the critical success factors, the benefits and the challenges related to working in cross-functional teams and digital transformation projects and present the best practice. The theoretical background is collected from reputable journals, authors and books recommended from the library or supervisor as well as own findings. The conclusion in chapter 6 will sum up the discoveries from chapter 5.

2. Theoretical background

Our approach is to describe the general theoretical framework of project management in order to get a broader scope and understanding of what project management is, and which methods are more relevant for the purpose of digital transformation. This will establish a base of understanding, and to better comprehend how and why cross-functional teams are commonly used. Furthermore, the approach will enable a better comprehension of how cross-functional teams work and function.

2.1 Traditional project management

A project can be defined as a "*temporary endeavor undertaken to create a unique product, service or result*" (Project Management Institute, 2008), which means that it has a defined beginning and end with no feedback loop (Fernandez & Fernandez, 2008; Rigby, Sutherland, & Takeuchi, 2016). A project has traditionally been perceived as finished as soon as the objectives of the project has been achieved, or when the project is terminated due to failure of reaching objectives. Another definition of a project is the allocation of resources directed towards a specific objective following a planned and organized approach (Lientz & Rea, 2002). Several tasks are often continuously ongoing and are run closely connected to each other.

The initial principles of project management were formed in the 1950's. The purpose of these principles was to create a method applicable to a broad scope of different projects, regardless of size and complexity. The framework of traditional project management builds on the concept of projects being simple, predictable and linear with defined restrictions concerning time and resources, with the purpose of making the processes more predictable (Špundak, 2014). Traditional project management was the only alternative until early 1980s, before changes started happening related to projects demanding more dynamic solutions to handle deviations.

By dividing different projects into Extreme, Traditional or Agile projects, based on how clear the goal and solution is, Wysocki (2019) has defined four different Project Management Life Cycles. This established the following model:

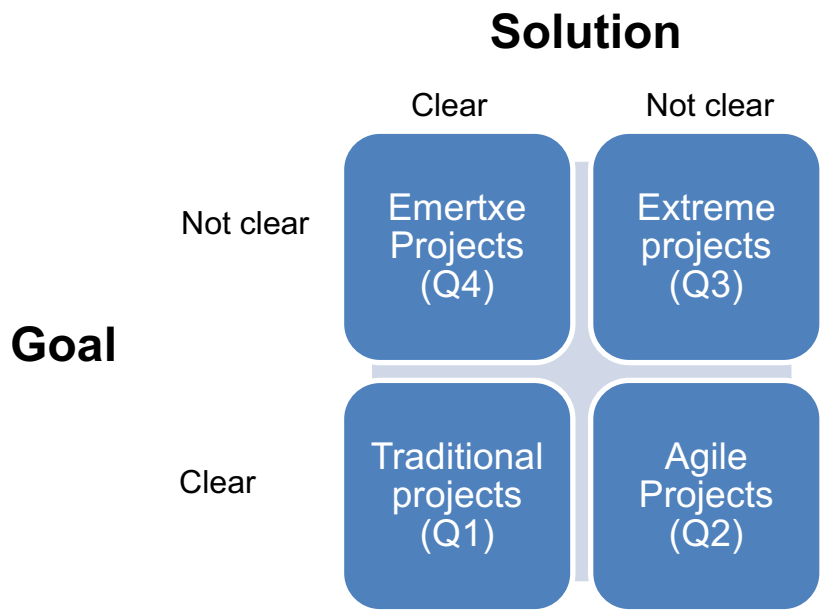


Figure 2: Quadrants of the project landscape (Wysocki, 2019)

Each of these quadrants have Project Management Life Cycles adapted for their project characteristics. The different quadrants line up with the following models:

- **Q1: Traditional projects** – Linear and Incremental models
- **Q2**: **Agile projects –** Iterative and Adaptive models
- **Q3**: **Extreme projects –** Extreme model
- **Q4**: **Emertxe projects** – Extreme model

2.1.1 Characteristics of Traditional Project Management

One of the assumptions with traditional project management is that the information needed to carry out the project goal and solution is available, and deviations are not expected. It is often described as the plan-driven, predictive or structured approach to project management.

The traditional characteristics of the Linear Project Management Life Cycle (PMLC) is defined by Wysocki as the following:

Figure 3: The Linear PMLC Model (Wysocki, 2019)

This cycle is defined and recognized by the sequential processes, where one is finished before the next one starts, and there is no going back to revise work that has already been done. A change that appears after starting the project will cause problems for the next steps in the process, with the result being that resources must be reallocated. In turn causing a domino effect onto other projects already scheduled for these given resources. In other words, traditional project management would not be suitable for projects that to a great extent are influenced and affected by external factors. Examples of projects where traditional project management can be a good option is infrastructure projects where similar projects have been done earlier. In this kind of project, information regarding resource requirements and time are more predictable and is often available before starting the process, and most outcomes are foreseeable (Wysocki, 2019). A traditional project has a defined goal, solution, requirements, functions and features, few or no changes related to scope and will be based on routines and repetitive activities.

The other Project Management Life Cycle is the *Incremental,* which differs by the fact that deliverables in this approach are released according to a schedule. This means that a partial solution is initially released before additional parts of the result are added to the original release, in order to form a better solution. This is repeated until the final increment releases the successful solution. This can be beneficial when it is important to get an early release to increase market share (Wysocki, 2019). The Incremental Project Management Life Cycle is presented as follows:

Figure 4: Incremental PMLC Model (Wysocki, 2019)

What defines a successful project can be explained through the traditional Project Management triangle (Cobb, 2011).

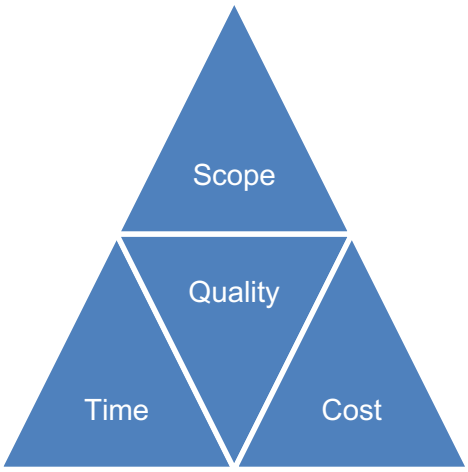


Figure 5: Traditional Project Management Triangle (Cobb, 2011)

This triangle describes that a project can be perceived as successful if the preset limitations concerning time, costs, quality, and the planned items are within the projects scope at the expected level of quality. An assumption here is that the scope of the project will provide business value.

2.1.2 Benefits and challenges regarding traditional project management

The first and foremost prominent benefit of using a traditional project management is related to the predictability concerning time, costs and quality. A uniform way of implementation was meant for to be applicable to a wide range of different projects, regardless of size and complexity. As these kind of projects normally are relatively simple, predictable, linear and have clearly defined boundaries, it will make them easy to plan in detail and follow without many changes (Špundak, 2014). A predictable plan and procedure reduce the needs for costly changes later in the project phases.

Additionally, using the traditional project management approach focuses on optimizing development over a longer period through documentation that later can be used for training and support (Boehm & Turner, 2005). By defining every phase of the project with clear requirements for each phase to be perceived as finished, the project will continuously be monitored and controlled.

The next benefit worth mentioning is the transparency for all parties involved when going through with a project using a traditional approach. Projects within an organization cannot function as a closed system, as it is dependent on input data from both inside and outside of the organization, and furthermore deliver experience back to the organization. The intentions of this process are to generate information that can improve the management of future projects in the organization (Project Management Institute, 2008).

On the other hand, the challenges of traditional project management are also prominent, especially when working with projects concerning development or implementation of technology or digital transformation. Despite the robustness, predictability and versatility being mentioned as some of the greatest benefits of the traditional project management approach, it is also one of the challenges.

First and foremost, what the traditional project management approach lack is responsiveness to a more dynamic and fast-paced working environment. The method has been described as insufficient for projects with a certain degree of complexity and unable to be used in the "real world" (Sommer, Dukovska-Popovska, & Steger-Jensen, 2014). This is because there are no feedback loops and continuous improvements, and as projects and business environments become more and more complex with a higher number of variables, tasks and interrelations, the ability to change has become more and more important (Špundak, 2014).

Moreover, with traditional project management one assumption is that it will be processed isolated and unaffected of its environment and surroundings. This is one shortcoming of the traditional project management approach, as projects regarding digital transformation typically are affected by its surroundings.

2.2 Agile project management

The agile project management approach started off as an evolution to the traditional approach in the sense that both approaches know the outcome, but the agile approach does not know the solution. Nevertheless, projects must be done in order to grow. The agile project management approach is used, when the goal is clear, but the solution is unclear. These projects are therefore more flexible and adaptive than the traditional project management approach, since more changes during the project are expected. Agility and flexibility are the keys to the

approach. Due to these key elements, the agile project management approach has shown to be especially effective in the development of technological advancements, such as software development. This is also why it seems to have been the most common project management approach used in tech- and software sectors in recent years.

2.2.1 Characteristics of Agile project management

Agile project management got its name from its agility and flexibility. However, as time passed the approach was mostly used for the software development. Because of this the Agile Manifesto (Beck & Thomas, 2001) was created by a group of software practitioners to easier apply agile project management to software development. The manifesto states the following:

Individuals and interactions	over process and tools
Working software	over comprehensive documentation
Customer collaboration	over contract negotiation
Responding to change	over following a plan

This implies that there is value to be found in the factors on the right, however, one is to focus on the left side factors. It ties back to the unclear solution to the problem, which is why one should rather focus on the ever-changing left side factors. Nonetheless, the right-side factors are more related to traditional project management, where everything needs to be planned and documented. These manifesto-points do however translate well into projects concerning the production of different products than digital products, if applied in a similar manner. The developers behind the manifesto also produce the 12 Principles behind the Agile Manifesto. Similar to the manifesto, all these 12 principles are mostly related to the development of software but are also applicable to other products. By changing “software” to “products”, it is easy to see how these principles are a good indicator of how to work with an agile project management approach. In order to be flexible, customer related and to focus on the finished product.

As a way of implementing agile project management there are two main approaches; the iterative project management life cycle and the adaptive project management life cycle. The iterative project management life cycle approach is used when details of a solution are not clearly defined or completely missing (Wysocki, 2019). Shown below is the iterative model

including several processes and a feedback loop. The purpose of the model is to show the customers lots of small iterations of working or non-working solutions and have them give feedback to better the outcome for their personal needs. This process will repeat itself until the product is exactly what the client wants, often done in several intervals. This learning-by-doing solution is also a characteristic for the agile approach in general, due to the unforeseeable nature of the approach.

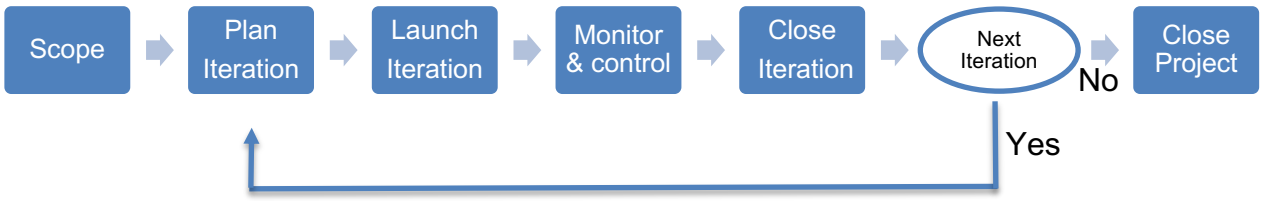


Figure 6: Iteration PMLC model (Wysocki, 2019)

According to Wysocki (2019) the implementation of an iterative model is done in such a fashion mentioned below in the following paragraphs.

The scoping of a project in an iterative model is more complex compared to the more traditional project management models such as linear and incremental in the sense that it requires a requirement breakdown structure. This is a process where the company and client meet to discuss the most important features of the final product. However, the challenge is that neither part will ever know how complete the plan is due to an agile project not being aware of its final product, but rather only the means. Therefore, one should lean more towards the decision of the plan being less complete, as this is a subjective decision.

The planning phase is done in two parts where first a high-level plan with little details is made, but which is never fully complete due to the nature of an agile project. Therefore, the little detailed plan will end up evolving as the project goes on and a clearer picture of the final product will be more and more complete.

During the launch phase the agile project management team that is assembled is almost the complete opposite from that of a traditional project management team. The agile team usually consist of less people, more skilled, co-located, employees with senior-level experience who are often unsupervised. The overall feel of the work-environment of an iterative model may

be perceived as more relaxed than other models. That is mainly because there are a few well-experienced workers who do not have any supervision while needing the bare minimum of documentation.

The monitor and control phase in this model are somewhat phased out due to the speculative nature of the model. Therefore, it is better to let the developers work unphased by constant controlling and documentation but rather review their work in the feedback loop. By doing so, the developers feel more in control and can focus on the actual work. The last phase, the closing phase, is much like the traditional project management model in that there are certain criteria that the product must fulfill. These criteria have been discussed throughout the entire development through the feedback loop, but also in the original scoping of the project. Still, there might be features wanted in the final product which did not make it due to the deadline having to be met. This is noted and put in a final report to be reviewed at a later stage to be learned from.

However, there is a last option for implementing agile project management, which is through an adaptive project management life cycle model. This is the last solution to a complete agile project management approach (Wysocki, 2019). The cases where this model would be chosen is in a situation where one knows almost nothing about the solution, because this model is related to cases which are in the far extreme part of the landscape. So, one would choose the adaptive model over the iterative model when less is known. Although, the premise of the two models are different, they are both identical in design, approach and execution. However, due to lack of agile theory covering anything else than software development, Wysocki (2019) saw a problem with the agile project management and this led him to his development of the Effective Complex Project Management framework. This framework is the basis of the Hybrid project management, which is a new approach seeking to find a combination of Traditional and Agile project management.

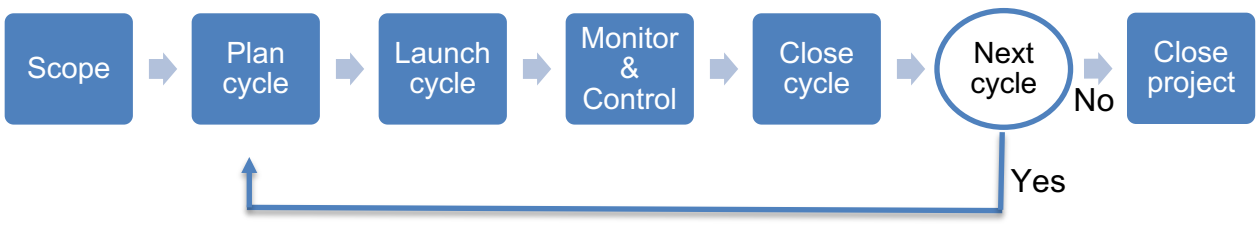


Figure 7: Cycle PMLC model (Wysocki, 2019)

2.2.2 Benefits and challenges regarding Agile project management

The main benefits of agile project management are all connected to the fact that it is a highly flexible and agile approach. The first benefit is that it makes it possible to modify the project after the original scheduling has been set in place (Koi-Akrofi, Koi-Akrofi, & Matey, 2019). This ties into the flexibility in a way that makes the final schedule an always changing concept that changes in order to follow client demands and requirements.

The second benefit also ties in with the first benefit and the flexibility aspect, as adding additional features to the product is simple (Koi-Akrofi et al., 2019). This is mainly due to the ever-changing schedule and feedback loop that is essential in agile project management. Because of this benefit of agile project management, these agile projects are most likely to be up to date with the most recent innovative enhancements.

The third benefit is that the feedback loop at the end of each cycle ensures that the customer gets what they want (Koi-Akrofi et al., 2019). This is perhaps one of the biggest reasons to why agile product management is as widely used as it is, because it is client focused to the core. Therefore, the schedule is as flexible as it is and why the whole approach is prone to change. Owing to this flexibility the customer needs might, and most likely will, change during the development phase. Due to the feedback loops and several cycles it reduces the risk of errors and mistakes in the final product, which is critical in such a process where a product is presented at the end of each cycle. This is particularly important when each cycle often lasts for only a short period of time. The solution leaves more time for the client to point out what new features they would want, rather than having to dwell in errors with the product.

There has also been examples of agile practices being more of a moral boost than traditional approaches (Augustine, Payne, Sencindiver, & Woodcock, 2005). It has to do with the fact that agile project management focuses on a smaller group of workers rather than of the traditional approach, leading to a better team dynamic. Faster project delivery has also shown to be a reoccurring benefit of agile project management (Cobb, 2011). This has to do with the entire process of the approach, where the flexibility and client related focus has the effect of the customer getting what he wants faster. Furthermore, this ties back to the benefit of less errors due to the frequent cycles and reviews, which also makes the process go faster because of less backtracking. Moreover, Cobb (2011) also mentions that agile project management has

the effect of reducing controlling costs of projects. However, Cobb (2011) also states that it is hard to compare due to the similarity in projects that have been compared previously.

Even though agile project management seem to have a lot of benefits, everything has its disadvantages, and the same is true for agile project management. The most common challenges with agile project management are related to the lack of structure of the workforce and project. Cobb (2011) for example, mentions that that corporate culture is one of the leading obstacles for the agile approach. Management and leadership style are one of the key points he mentions as most companies do not have suitable management structures for adopting the agile approach. Such management challenges also make it more difficult for the organization to commit to the cause, because a common vision for projects is hard to establish for the entire company.

Furthermore, the fact that agile project management calls for smaller teams over shorter time periods makes it hard to upscale for larger projects (Boehm & Turner, 2005). This seems to be a problem when companies attempt to implement agile project management on a smaller scale to see how it works, and then try to make it the norm for the company. However, Boehm & Turner (2005) are tougher in their critic when it comes to lack of documentation required. Whereas the traditional method needs heavy documentation to proceed and function, the agile method requires little to no documentation as it would interfere with the developers' processes. The problem with this is that there is also little to no documentation to review after the project is done, other than the final product.

Finally, there are problems that evolves from the core value of customer focus. Even though the agile project achieves great results by focusing on the client and meeting their demands, it also means that the team and project as a whole has to spend considerably more time than others on customer relations (Koi-Akrofi et al., 2019). This process demands great dedication towards the customer for the project to be a success. There might even have to be customer training involved, so that the client knows how to operate during the process. If it ends up being a lack of customer involvement it will affect the final product.

2.3 Digital Projects and project-run digital transformations.

Digital transformation projects can be defined as modern -day software projects and the implementation of these in organization. This type of projects primarily rely on digital technologies such as experience platforms, enterprise portals, content systems, commerce platforms, user experience technologies, mobile technologies, search and collaboration (Shivakumar, 2018). The purpose of the digital transformation is often streamlining and increase the speed of already existing processes. The words digitalization, digitization and digital transformation are often used in the same context serving similar purposes (Schallmo, Williams, & Boardman, 2017). Schallmo et al. (2017) states that the terms digitalization and digitization often are used interchangeably, and therefore only one of them is defined: "*Digitization stands for the complete networking of all sectors of the economy and society, as well as the ability to collect relevant information, and to analyze and translate that information into actions. The changes bring advantages and opportunities, but they create completely new challenge*" (Schallmo et al., 2017). Digitalization has also been defined as "*the action or process of digitizing; the conversion of analogue data into digital form*" (Päivi et al., 2017). Moreover Schallmo et al. (2017) have collected several definitions from different literature. "*Digital transformation - The use of technology to radically improve the performance or reach of the enterprises*" (Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2011). *"Digital transformation is the deliberate and ongoing digital evolution of a company, business model, idea process or methodology, both strategically and tactically"* (Mazzone, 2014).

For this particular research, digital transformation is perceived as a wide term and includes projects developing or implementing solutions involving technology in a business to improve performance. Examples of this are software development, bot-services and the conversion of analogue data into digital forms, such as forms for travel expenses in a company.

Shivakumar (2018) lists the following key tenets of Digital Projects:

- The project uses modern day technologies such as experience platforms, commerce products, API platforms, Big Data technologies, AI technologies etc.
- The project releases are mainly executed through an Agile methodology or in iterations to attain shorter time to market.

- The primary success metrics are user engagement, performance, responsiveness, agility, and user conversion.
- The solution mainly caters to internet users and provide omni-channel capabilities.

Digital projects tend to use agile or iterative project management approaches and calls for niche skill sets with limited availability, and the target audience is usually business to customer through the internet.

A digital project can usually be divided into three different phases:

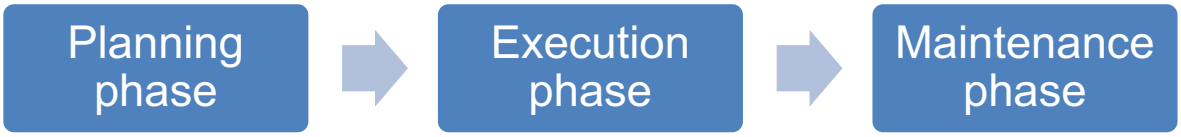


Figure 8: Digital Project Phases (Shivakumar, 2018)

- The *planning phase* includes the project initiation activities. At this point the scope is defined and the functional/non-functional requirements are determined. For the project manager this includes performing planning concerning scope, schedule, cost and effort, resource, communication and risk.
- The *Execution phase* mainly consist of code development and testing. Quality controls measures and risk management activities are carried out by the project manager during this phase.
- The last phase of the Digital project phase is the *Maintenance phase*, where the solution is maintained, and incremental enhancements are added. After the solution is launched the project enters a steady state operations mode. For the project manager this includes management tasks concerning release, change, defects, SLA monitoring and similar operations concerning the product (Shivakumar, 2018).

The digital transformation of a business includes organizations looking to transform their business models and enable business processes with digital technologies. The aim here is to bring agility into the business processes by making it more adaptive to change and scale the existing systems for further business expansion and growth. As a result of this transformation the business can leverage new opportunities and possibilities made possible by the implemented solutions and technologies. This calls for several organizational changes, and cross-functional teams must cooperate in order to successfully implement the new solutions. The digitization of a business model should also reduce the time to market, which can be done

through continuous integration and continuous deployment. By using this approach the product can be launched “unfinished” with continuous improvements and upgrades (Shivakumar, 2018).

There are several challenges related to a company pursuing a digital transformation. For example, obtaining the *niche digital skill sets* necessary for the specific project, *resistance to change* concerning business processes and models, and lastly *governance changes* related to organizational culture, need for accurate tracking metrics and people mindset. One of the agile success factors is to create a *cohesive team* where subject matter experts and functional experts work side by side. By defining cross-functional roles and responsibilities the goal is to ensure active participation from members with different skill sets and knowledge (Bishop, 1999; Shivakumar, 2018).

2.4 Cross-functional project teams

One of the main benefits with project work is that it can combine professionals with different backgrounds, skill sets and knowledge in order to create the best team for the specific project. This type of project teams are frequently used in settings where participating in projects where diverse knowledge is required in order to solve relevant problems, such as digital transformation (Young-Hyman, 2017) and to enhance competitive advantages and benefits of different viewpoints (Zhang & Guo, 2019). Although it is a great benefit, cross-team collaboration is also stated to be a great challenge in digital project execution, in particular for organizations in knowledge-intensive industries (Young-Hyman, 2017). Digital transformation projects involve various technology teams, operations teams, product vendors and independent consultants. This requires clear channels of communication and collaboration across all teams to build “one global team” approach (Shivakumar, 2018). Clear channels of communication are particularly important in big organizations, where input from several people can be valuable and, in some cases, critical.

The challenge concerning this is to determine who these people are - in other words whose input is essential in order to succeed with the project. This is done by identifying the right individuals by going to each department and asking for the persons possessing the right skills and knowledge (Atkinson, 2005). To begin with, a team can be defined as a collection of individuals who are interdependent in their tasks, sharing the responsibility for outcomes,

seeing themselves and being seen by others as an intact social entity embedded in one or more larger social systems, and who manage their relationships across organizational boundaries (Holland et al., 2000). In other words, interdependency is essential and team members are reliant on each other. What defines a cross-functional team is the application of different skill sets, with the same high degree of interdependence, ensuring effective delivery of a common organizational objective (Holland et al., 2000).

Cross-functional teams are put together of individuals drawn from different functional units possessing different skill sets and knowledge relevant to completion of the specific project. Cross-functional cooperation promotes knowledge sharing, because it is associated with the perception of individuals on the collective use of the shared knowledge in pursuing common interests of the team (Ghobadi & D'Ambra, 2012). Through the usage of cross-functional teams, the decision-making is decentralized by using a lateral decision process. This disrupts from the traditional vertical lines of functional authority, contributing to speed up the decision-making process (Bishop, 1999). Holland et al. (2000) mentions the following obstacles/challenges related to the use of cross-functional teams: Conflicting organizational goals, competition for resources, overlapping responsibilities, conflicting personal goals, no clear direction or priorities and lack of co-operation. On the other hand, the benefits mentioned are increased speed, improved ability to handle complexity, fostering of an entrepreneurial culture, customer focus, enhanced creativity, single point of contact and improved quality of information at higher levels**.**

Another study also claims that cross-functionality has a positive effect on time-efficiency (Park, Lim, & Birnbaum-More, 2012). Despite cross-functional interactions may be expensive and complex, they are expected to improve performance in the mentioned knowledge-intensive work (Young-Hyman, 2017). Young-Hyman (2017) mentions that the increased cross-functional interaction offers a means for team members to exchange information and coordinate tasks during team-based project work. Furthermore, increased interaction between teams to align interest differences resulting from heterogenous membership in teams (Young-Hyman, 2017). These factors are expected to improve team performance in knowledge-intensive work. Knowledge-intensive organizations has been described as an organization where knowledge has more importance than other inputs and human capital dominates (Medina & Medina, 2017), therefore digital transformation projects must be defined as knowledge-intensive.

One study solely focuses on the relationship and social challenges related to cross-functional project teams, caused by different functional departments having distinct "thought worlds" concerning communication, values and believes. The combination of intrapersonal diversity, uncertain project tasks, organizational culture diversity and inappropriate behavior positively influence relationship conflict and challenges related to social differences in cross-functional teams (Huo, Zhang, & Guo, 2016). Furthermore, the importance of team selection in order to utilize the team resources are also exclusively discussed in a research paper (Hsieh, 2010). The conclusion in this paper is to use a knowledge-based perspective when selecting a fitting team for the specific project by appropriately analyzing the fitness between capabilities required to undertake the given project with the capabilities of the candidate team. This specific challenge is stated in several articles and relevant literature and is not only related to balancing the team based on the project, but also the importance of knowledge integration in order to establish common understanding of the project (Huang & Newell, 2003).

Bishop (1999) points out several key success factors for cross-functional project teams.

- **Project sponsorship and upper management support:** The project sponsor is the initiating part of the project and is responsible for the budget and resources as well as the functions/departments involved. In order to complete the project full commitment from project sponsor and management support from all affected areas are crucial.
- **Project goals/scope/objectives:** In order to align the teams with goals, scope, objectives and corporate strategy, they must be clear and well-defined. Having these matters defined helps the project sponsor communicate their desired outcome throughout the project team, and the organization as a whole. Additionally, each individual and group must establish their own goals, preferably aligned with the ones in charge of the respectable matter. Alongside establishing own goals and project goals, a study has shown that project commitment is characterized by each member commitment towards said goals (Ehrhardt, Miller, Freeman, & Hom, 2014). However, this commitment is powered by individual acceptance towards the project goal. Meaning that each project member must believe in the project, be willing to contribute to the best of their extent and want to see the final product finished in a best possible manner. Ehrhardt et al. (2014) shows that their study finds significant positive relations regarding cross-functional teams and member's commitment to the project goal.

- **Leadership:** Bishop (1999) argues that it is a necessity that the project leader has a positive attitude, commitment to the project, effective leadership skills, and is in a position of authority with respect to the project and the project sponsor. In addition to these abilities, good coordination skills are also crucial in order to secure involvement and commitment of all members to the team's goals and objectives. To further build on Bishop (1999) attributes of a good project leader, Thamhain's (2013) study shows that an effective project leader is a social architect. Meaning that a project leader should be able to foster active participation by involvement from several levels of the organization in every aspect of the project (Thamhain, 2013), such as the planning and execution. However, in order to do so the project leader needs adequate leadership skills. Taking a digital project example, then the project leader would need insight into both the administrative and the technological aspects of the project.
- **Membership/resources:** Sufficient and well-chosen team staffing and members with the skills matching the specific project is also crucial for a successful cross-functional project team. Moreover, adequate financial and budgetary support is important to keep the project moving forward in the planned time frame. As soon as the team is chosen the team members need sufficient time allocated to perform their designated tasks and be given access to required organizational tools and resources. Ehrhardt (2013) mentions that providing sufficient and related resources to team members will demonstrate a supportive position towards the project goals. Meaning that the project leader has an ability to better a specific members commitment to the project. And because the important nature a project often has, then these positive supportive actions are not to be overlooked (Ehrhardt et al., 2014).
- **Communication:** Almost needless to say, communication is an important factor in project work, especially when working in cross-functional teams. Primary to break down preexisting physical and functional boundaries between the different cooperating departments. However, even though communication might be the most important aspect of cross-functionality it comes at the cost of knowledge sharing having to be effective, or cooperative communication as Ghobadi et al. (2012) puts it. They found that competition greatly effects the way teams share their knowledge within a team (Ghobadi & D'Ambra, 2012). Competition referring to the competition to obtain either tangible or intangible resources. Following this, competition for tangible resources showed to have a positive effect concerning communication and competition for intangible had negative effects on communication (Ghobadi &

D'Ambra, 2012). Whereas an intangible resource was exemplified as a political competition.

- **Team Authority/Autonomy:** This concerns establishing a team-structure and external and internal decision-making in the project. This includes the ability to schedule team meetings and activities, select new members and/or the team leader as required, control internal team processes and activities as well as make decisions without the approval of non-team members. These factors contribute to effectivity within the project, handing the right to make decisions to the right people. Teams with the access to make decisions externally have a greater chance of being effective. Thamhain's (2013) study also underlies that the aspects of authority and autonomy is important for the project leader to be able to manage the project in the best possible way. If they have no authority, they will feel restrained in their ability use the tools they deem necessary. By recognizing the autonomy of all the project members there can be built good partnerships with a well-working line of communication.
- **Performance/Reward system:** Evaluating and clearly identifying the individual job responsibilities and performance standards of the different members, contribute to more effective implementation. Leaders must actively work to appraise and recognize members for their effort. This reward and recognition process should be consistent through the team.
- **Team dynamics:** Open communication to and among all teams in a project and mutual communication is crucial to ensure and maintain mutual respect and trust. This can be obtained through the project leader demonstrating respect and consideration for all members of the team. The first step is to choose the right people for the team, next is to give them the trust to do the job their set to do. Team members must feel that they are a part of group where it is okay to deal with conflict, challenges and disagreements. This is all a part of reaching the end goal and objectives. Moreover, Daspit et al. (2013) also mentions in their study that team dynamics influence effectiveness using shared leadership and cohesion in other forms of teams. However, in cross-functional teams there seems to be no direct connection between effectiveness and team environment, and shared leadership does not directly influence cohesion (Daspit, Tillman, Boyd, & Mckee, 2013). This suggest that the team dynamics of cross-functional teams indirectly influence the effectiveness.

Cross-functional team approaches should be used with caution, as there are several challenges related to them. It can be a complicated procedure and raises several risks. Combining cultures can create disagreements concerning “turf issues”, team member status, compensation issues, improper use of information and lack of information flow. By addressing these issue and being aware of them when creating teams, goals and objectives one can benefit from it by building mechanisms able to respond quickly to rapid changes in environment and market (Bishop, 1999).

3. Methodology

A methodology is defined as a systematic procedure (Gripsrud, Olsson, & Silkoset, 2016). However a more business related definition is research that can be described as a systematic and organized effort to investigate a specific problem encountered in the work-setting, which needs a solution (Sekaran & Bougie, 2016). With this definition in mind, the following part will define the methods for gathering data for the further analysis regarding the research question. This includes the research method, research design, interview process and an insight in the validity and reliability of the data collection.

3.1 Research method

The first step in the research process is to define the problem statement. The purpose of this thesis is to research the success factor, benefits and challenges of putting together a cohesive team of functional experts working together in order to find the best solutions for projects concerning digital transformation. Through the review of the relevant literature cross-functional teams was mentioned to be both a challenge and a key success factor when dealing with digital transformation. The challenges of the team creation come from unclear communication, different skill sets and different knowledge etc. However, when this all comes together correctly the outcome will be a well-diversified team that cover all aspects of needed knowledge and skills. Based on this problem the following research question was formed: *"What are the benefits and challenges of using cross-functional project teams in digital transformation projects?"*.

Once the research question was settled, the design of the study must be determined, if it is exploratory, descriptive or causal. For this research thesis an exploratory design has been used. This is because an exploratory question looks at problems that are not well known, existing research is unclear, are highly complex or there is not enough theory regarding the topic (Sekaran & Bougie, 2016) which is case with this thesis. This research method is often associated with the use of qualitative design for data gathering, such as informal discussions, interviews, focus groups and case studies. This is due to the flexibility of the exploratory method, which comes from its nature of trying to explore a topic further in depth without the need for any heavy numerical base.

After defining the research statement, creating a research question and defining the type of question, there is a need to choose which design to use for data gathering. The three main designs are quantitative, qualitative or a mix of the two (Saunders, Lewis, & Thornhill, 2015). Qualitative design looks at the information, which is not possible to analyze numerically, for example the use of cross-functional teams in digital transformation projects. The qualitative design is more about the depth of a topic and understanding, rather than explain like the quantitative (Gripsrud et al., 2016). Several of the qualitative designs are naturalistic and emergent in trying to develop a deeper understanding about a theoretical perspective than what the existing literature can explain. Therefore, qualitative research tries to find the meanings and relationships of a participant, often using interviews to gather data in order to develop a theoretical contribution (Saunders et al., 2015).

For the purpose of the research question in this thesis, further research will be made into an exploratory qualitative design with a focus of going in depth of the topic. This is because the goal is to explore how cross-functional teams in project management projects are one of the key success factors regarding digital transformation, which is a clear exploratory question. The use of a qualitative design also ties back to this because interviews with practicing experts and other parts of the whole project team will give an output that will explain why this topic is as important as it is. The key here is to interview several people involved in the project, but with different roles, e.g. the project leader, an IT developer and a HR staff member.

3.1.1 Data collection - Interview

The data collection will use an exploratory qualitative design where one of the more widely used methods are interviews (Sekaran & Bougie, 2016). An interview is defined as "*a purposeful conversation between two or more people, requiring the interviewer to establish rapport and ask concise and unambiguous questions, to which the interviewer is willing to respond, and to listen attentively*" (Saunders et al., 2015). In the case of this thesis in-depth semi-structured interviews are considered most advantageous in order to get an understanding of the team creation in practice.

Because a semi-structured interview is the middle-ground between the formal structured and the informal unstructured, where the researcher usually has a set of topics and themes that they consider as key and want to focus on, this was chosen (Saunders et al., 2015). In this

style of interview the guideline made beforehand might differ due to the way the interviewee answers the questions. Because of this ever-changing format semi-structured interviews will most likely never be identical. However, the main purpose of the interview will be to get a grasp of the underlying research topic. Therefore, a semi-structured interview still needs to be guided by some premade questions that keep the conversation in line. If not, the interviewee might drift away from the relevant subject, and the outcome of the interview becomes less and less useful regarding the research topic.

3.1.2 Analyzing the data

After the interviews are done and all data has been collected it is time to analyze the data. In doing so there are several elements that needs to be considered. For example, it might help to prepare the raw material of the interviews in some sort of way, such as transcribing. After such preparation has been finish it is time to choose what type of analysis method is the best. When it comes to analyzing qualitative data there are several analyses to choose from, but in the end it all depends on what would best address the research question. All these further analyses are based on the nature of qualitative data, which seeks to find socially constructed meaning regarding a topic (Saunders et al., 2015). For this reason, this non-standardized data will more than likely be highly complex.

By transcribing the interviews for further analysis, we were able to easier identify key themes and indicators from the collected data. However, transcribing about five one-hour long interviews is very time consuming. For example, it takes a touch-typist between 6-10 hours to transcribe every hour of audio recording (Saunders et al., 2015), which in turn gave us a good indicator of how much time this would take. Transcribing turned out to be useful as it refreshed our memories concerning the points mentioned during the interviews and reminded us about the tone that was used to answer each question. When transcribing audio recordings into text it is hard to communicate the use of language. This is mainly because verbal and written language is very much different from one another (Saunders et al., 2015). However, the transcribing went well, establishing a good base for the following data-analysis.

After the transcripts were written it was time to start analyzing the data collected. Once looking through different methods of analyzing qualitative data we found that the thematic approach would be the best fit for this thesis. This is because of the flexibility and accessibility such an analysis provides. Additionally, it also stays systematic, making coding

data an easy process that also visualizes the data in a suitable manner. The thematic approach is described to be effective with regards to the following (Saunders et al., 2015):

1. Comprehend large amounts of qualitative data
2. Integrate related data from different transcripts
3. Identify themes or patterns from data
4. Produce a thematic description
5. Develop tests based on thematic descriptions
6. Draw and verify conclusions

A strength of the generic thematic approach is that it is not used by any particular philosophical view, making it compatible for most of them. The effect will be that the underlying philosophy of the researcher is put more in focus, and in this case that philosophy is a way of neutral thinking and that the experts interviewed knows best. Because of this underlying philosophy, a generic approach like this will work well due to it being applicable to several sorts of analysis. Saunders et al. (2015) mentions that the thematic analysis is a good option for both realist studies and interpretivist studies. Because of the straightforward nature of thematic analysis, the researcher can focus more on finding fundamental themes in comparison to other analytic techniques.

Because the generic approach allows the researcher to better search for themes described by the data, we found this approach to analysis to be the best option in the case of this thesis. Furthermore, because it follows a simple procedure, we found it to be very useful to paint a picture of both the key success factors, benefits and challenges when dealing with the use of cross-functional teams regarding digital transformation projects.

3.2 Data quality issues

When undertaking a qualitative research two main concerns are to be accounted for: validity and reliability. These two concerns are key when it comes to the quality of the research, especially when looking into social aspects as done in qualitative research does (Saunders et al., 2015).

3.2.1 Validity

Validity is a measure of whether the research looks at what it intends to, meaning that the data collected has the power to describe or make it possible to understand the research question (Saunders et al., 2015). In doing so it is important to gather data from different sources to ensure that the validity is strong. Furthermore, validity is divided into two kinds of validity: internal validity and external validity, where internal validity describes to which extent the results are valid regarding the research question. On the other hand, the external validity describes how the results are applicable to different situations.

The issue of internal validity in this study has been tried minimized by interviewing all types of people involved in a project, meaning people with different roles in the project. By interviewing these different kinds of professionals from several organizations the validity should be strong. As for the external validity we believe that the results of this study should be applicable to most projects regarding digital transformation as they are key indicators for success. Therefore, this research will most likely be used as some inspiration when trying to choose the right people for such a cross-functional team that is needed in these cases.

However, there might always be some underlying factors that influences the validity, such as the interviews themselves, the questions asked during the interviews and overall knowledge on both sides on the interviews. Nevertheless, the results of this research are believed to paint a realistic picture of the common practices from every perspective of the cross-functional team. This will in turn illustrate the common success factors and pitfalls when constructing such a team.

3.2.2 Reliability

Reliability refers to what degree the research would lead to the same results if re-done. Due to the nature of qualitative research it is hard to justify a fully reliable research. In the case of this research there was conducted semi-structured interviews that followed an interview guide. However, as the interview subjects have different input and points of view, it would be hard to produce the exact same results again, due to digressions from the participants. Because of this, the interview guide was followed perhaps more strictly than necessary in order to keep the interview on topic, and additionally in order to get a consistent output of answers, and not just digressions. However, the questions in the interview guide and follow up questions made during the interview was conducted in such a way that the interviewee

were able to elaborate and further explain their own points of view. This contributed to establish a safe environment where thoughts could be shared. Despite this being the base, a lot of the answers correlated, which points toward good reliability.

To further improve the reliability, we saw that transcribing all the interviews helped to put everything in a more systematic order. It made it easier to compare the different answers to the set questions and look away from the digressions. Although we found the digressions very interesting, they function more as a further investigation rather than as the main purpose of the interview and data. Secondly, a total of five interviews were conducted with participants having a wide range of backgrounds including several members essential in a cross-functional project team, working on digital transformation. Lastly, to improve the reliability, the purpose of the interview was stated as an introduction. This was to freshen the participants' minds and initial thoughts and remind them of the research objective. This in turn helped the interviewees remember what they had agreed to be interviewed for and piqued their interest once again.

3.3 Final design and execution

The final methodology used in this thesis to analyze the data collected from interviews, is an exploratory qualitative design with thematic analytic approach. Meaning that we used the standard process for thematic analysis, which is a four-step process (Saunders et al., 2015). This process starts with becoming familiar with the data, which was done through the process of transcribing the interviews that had been conducted in semi-structured in-depth interviews. These interviews were done using Microsoft Teams due to outbreak of COVID-19. Although this was not what we had intended, it worked out well with every one of the interviewees showing up on time, being fully concentrated during the interview and was well prepared to share their points of view and expertise. The second step is to code the data. This was done by going through the transcriptions and color-coding the relevant factors mentioned, and finding codes mentioned by several participants. From there on the next step is to search for themes and recognize relationship. From the coding we had done we, found it easy to spot the key success factors, benefits and challenges which then made it easier to identify the themes within the data. The last step is to refine themes and test the proportions, which has been done by comparing the success factors, benefits and challenges found through interviews to those

of the theoretical framework presented earlier in the thesis. Through this entire process we think that the data collected was both reliable and valid for the further analysis.

3.3.1 COVID-19

Due to the COVID-19 outbreak in the end of February/start of March a lot of our planned interviews fell through because the organizations had to prioritize matters concerning the outbreak. Despite roughly half of our interviews not going as planned, a lot of high-quality data was still collected, and is perceived as both reliable and valid. This is because we got to interview several people from different parts of a digital transformation project, such as the project leader, project member and developers. As mentioned in the data quality issues subchapter, we tried to avoid this problem by interviewing people from several different companies and different roles. We tried over the period of a month to arrange and agree more interview, but without success. The excuse we most often got from the new connections we tried to settle an interview with was the same as the already planned interviews: the COVID-19 situation did not allow them to prioritize participating in our research project. Nevertheless, we think that the interviews conducted are both valid and reliable for further analysis.

4. Results

The results from the data collection are based on themes identified earlier, from the theoretical background: Critical success factors, benefits and challenges in cross-functional teams within digital transformation projects. The analysis of the collected data is conducted using meta-matrices, as mentioned by Saunders (Saunders et al., 2015). The interviewees are listed in the columns, and the data codes in the rows on the left. If marked the interviewee indicate that he/she mentioned the code supporting the cell.

The participants have been involved in several different types of digital transformation projects from both private and public sector. The projects mentioned involves app-development, software-development and making already existing information available through digital platforms. Making already existing information available through digital platforms includes for example filling out forms digitally rather than on paper, e.g. travel expenses. One of the participants has also been involved in the development and implementation of a chat-robot.

Although the solitary thing the participants where are asked about and generally spoke of is projects concerning digital transformation, several of the success factors, benefits and challenges mentioned are applicable for not only digital transformation projects, but also for project work in a more general context.

4.1 Critical success factors

Success factors	1	2	3	4	5
Take time to understand the extent of the project	x		x	x	x
Experienced project leader with knowledge on several fields of expertise	x	x			x
Map out the project to sort out what resources are necessary	x	x		x	x
Develop ownership to project, include members from day one	x	x	x	x	x
Day-to-day communication and follow-up	x	x		x	x
Compromise when listening to experts		x		x	

The transcripts from the interviews developed six different codes pointing out critical success factors being important when working in projects with experts from different fields. The interviewees were not asked specifically to mention critical success factors, but the results were extracted throughout the conversation.

Take time to understand the extent of the project is the first code and was mentioned by four of the five interviewees. What the interviewees mention is that when working with digital transformation projects a lot of effects are not clear until later in the process, which may cause trouble if one is not prepared. This is especially challenging when working with technology-dependent projects, and people from different fields of expertise. Interviewee 1 remarked that when working with technology the project leader often has a tendency to rush things forward, before actually being aware of the consequences. Moreover, what makes this a critical success factor is that the necessities from the customer also unravels along the project. For example, interviewee 5 mentioned that you cannot take for granted that the customer knows for sure what they want and need at the beginning of the project. In order to avoid wasting the customers and the team's time, the understanding of the project must be agreed as soon as possible during the early stage of the project.

Several interviewees mentioned the importance of an **experienced project leader, with knowledge on several fields of expertise.** More specifically, the participant claimed that this factor is even more important when dealing with cross-functional teams and projects concerning digital transformation than other projects. The reasons this is emphasized as important is that in order to coordinate and delegate tasks among the different functions, the project leader needs to understand the different tasks. Moreover, to really understand what is needed from the different team members, it is crucial that the project leader has an overall understanding of the technical perspectives of a project as well as the end result. It is not required that the project leader is an expert on every field, but what is important is his/her overall understanding, and how to use the resources he/she has available to assure quality through the different processes. This is arguably even more important in digital transformation projects than others, as other projects are narrower, and touches upon fewer areas of expertise. Whereas digital transformation projects demand knowledge on several different fields.

Furthermore, what is also emphasized from several interviewees is the importance of early in the process to **map out the project to sort out what resources are necessary.** What is mentioned by the interviewees is the importance of spending a lot of time mapping out the project and using tools to do this. By doing so the project leader can establish which resources are beneficial to include in the project, and which resources are absolutely crucial and critical. The team must map out which areas of expertise the project will touch upon and select team members accordingly. One of our interviewees pointed out how important this is, and how it seldom is mention in relevant theory. Project leaders tend to rush forward in the project, while the interviewee stressed the importance of making sure you consider and assess the critical areas of the project when selecting team members. If a project is rushed forward, the project does not get the chance to protype, test several times, go back to the drawing board, and then run tests once again.

Moreover, the importance of **developing ownership to the project and include team members from day one** was emphasized by several interview participants. Even if a resource or team member is only included in one single part of the process, it is important to establish common grounds and a mutual understanding of the project and the desired end result. This seems to be quite unique for digital and cross-functional projects, as several members are only needed for a minor part of the project as a whole. What the given interviewees emphasized was that regardless of each members' relative participation, it is crucial for the quality of the end result that the contributors feel ownership to the project. If the project leaders fail to give the members a feeling of ownership to the project, they tend to not fully engage nor find the best solutions. It may also result in the members using shortcuts, which can have a very negative effect on the end result. In order to visualize this, one of the interviewees suggested to imagine what effect it would have if you add a new member, halfway through a master thesis, and what challenges this would cause.

What all interviewees stressed was the importance of **day-to-day communication and follow-up** with every involved part. It is important, particularly when working with digital transformation projects, to ensure that all of the project team members are aligned and working in the same direction. In order to keep every part up to date with the progress, day-to-day communication is crucial. Communication is critical in all parts of the project, from understanding and stating what the visional end result is to communicate this vision to every member of the team.

Several of the critical success factors mentioned are related to each other, which is natural and expected. One such factor for cross-functional projects dealing with digital transformation projects is the importance of establishing a common ground of understanding among all team members. In some instances, the customer does not even know exactly what it wants from the end product, which makes it even harder for the project team to know how to satisfy them, and develop a solution serving their needs. This makes it important to have the right resources and knowledge on the team from early on.

4.2 Benefits of using cross-functional teams in digital transformation projects

Depending on the project, there are different benefits of using and utilizing the cross-functional teams. Throughout the interviews several different benefits were mentioned, which are visualized in the chart below.

Benefits	1	2	3	4	5
A functioning solution	x			x	
Identify potential pitfalls	x				
Knowledge-sharing across areas of expertise		x	x		
Wider perspectives	x	x	x	x	x
Quick problem-solving			x		

The use of cross-functional teams when dealing with digital transformation projects may be perceived as crucial. Two of the interviewees mentioned that one of the benefits is that you will end up with **a working solution** when utilizing the cross-functional teams. Using resources with different skill sets and knowledge builds a better foundation and develops improved prerequisites to succeed with what is intended for the project.

Moreover, one of the interviewees stated that the use of people with different expertise can **help identify and avoid potential pitfalls.** What is important concerning this is to create an environment where every person's voice and opinion is heard. By listening to every expert early in the process, a lot of pitfalls can be predicted beforehand, and in that way also avoided.

Furthermore, what cross-functional teams should strive for is **knowledge-sharing across areas of expertise.** By creating teams that includes professionals with different backgrounds you get more input from different sources, which improves the chance of developing good and functioning solutions. One of the interviewees mentioned that brainstorming with like-minded often turn in to an echo chamber, where no actual new ideas are developed. By sharing knowledge, the outcome might be smart solutions based on knowledge, experience and expertise not commonly thought of. This also touches upon what interviewee 5 mentioned, that when you have experts on different fields, you do not have to have an opinion on everything. This is also a good point and mindset, which can help the team create even better results and solutions.

A code which was mentioned by each one of the interviewed professionals were the benefit of establishing **wider perspectives** in the teams. This builds on the prior mentioned factors but goes beyond knowledge-sharing. What several of the interviewees mentioned is that one can easily end up in a loop when working with like-minded individuals, which can be avoided using cross-functional teams. Workshops were cited as one of the tools used in order to establish common grounds, where professionals with different backgrounds meet and discuss. In this way every part can learn from each other, and consequently widen the perspectives of every participant.

The final benefit mentioned is **quick problem solving.** This was explained with when having the resources already available on the team, it is easy to find the answer to problems one can encounter along the way. Unlike other projects, where problem-solvers often comes as hired consultants or other people external to the project-team or organization.

4.3 Challenges of using cross-functional teams in digital transformation projects

In order to get a more nuanced perception of how the cross-functional teams work, the interviewees were questioned about challenges. The results of this questioning are stated in the matrix below.

Challenges	1	2	3	4	5
Communication	x	x	x	x	x
Project leader	x				x
Balancing the team	x	x	x		x
Developing ownership	x	x	x	x	x
Tolerance for change		x		x	x
Social differences		x		x	x
Use of digital tools			x	x	x

The first and one of the most prominent challenges turned out to be **communication**, which is stated to be a greater challenge in cross-functional teams relative to other projects. Communication was in fact mentioned as a challenge by every person interviewed. Whether the matters being discussed are very technical, complicated or deeply rooted in one groups' expertise, communication can become a challenge. A point mentioned is that when running projects that rely on technical solutions, regular minutes of meetings does not necessarily serve its purpose sufficiently. Furthermore, it was mentioned as challenging to make every participant understand the purpose of the different parts of the project. Although a total understanding of each participant is not necessary, it is crucial that every participant is aware of the overall picture and expected result.

It is imperative that the communication support the common solution which all participating project members agree upon. If this is not done right you might end up with a product that is not what the customer asked for, but rather a product serving a lot of different purposes. Altogether, the most important part concerning communication is to establish a common understanding of the intentions of the project. In order to achieve this, communication is necessary on various levels. A factor mentioned by several of the interviewees was that some people tend to sit with a lot of opinions based on their knowledge and information, without sharing it prior to being asked. This can be addressed by good and effective communication

channels and culture, in order to facilitate for a safe environment where everyone can contribute with their knowledge.

Several interviewees mentioned it as challenging to choose the right **project leader**, as a lot of qualifications are demanded from them. It was stated that the importance of having an experienced and qualified project leader is not valued enough. With the appointment of a wrong project leader you run the risk of having team members not attending meetings, prioritize other tasks or other matters which may affect the end result negatively. When it comes to the cross-functional part of this challenge, it has to do with the project leader securing progress in all corners of the project and making everyone understand the importance of their specific task.

Appointing a project leader will have to address topics that goes beyond what he/she have gotten of project management skills. It does not matter if they have several courses in project management, if they lack comprehension of the final product. It was suggested that this particular challenge can be solved by consecutive follow-up and quality assurance from experts on the fields.

Another major challenge mentioned by four of the five interviewees is **balancing the teams** and being, as mentioned by one of the interviewees, sufficiently cross-functional**.** Based on the expected outcome, the team has to include resources with the certain and different skill sets. This is done after mapping out the extent of the project, where one can start to see what different resources are required for the different processes. This is often done by using experts from different fields, who are aware of the scope of the different demands. Finally, one need to assess and make sure that all areas that the project touches are addressed and represented.

Also mentioned as one of the critical success factors and a great challenge was to **develop ownership to the project** among all the team members. All the interviewees agreed that this is a major challenge when it comes to cross-functional projects. As mentioned earlier in this thesis (the critical success factors part-chapter) the reason why this is more challenging in cross-functional projects is that the level of involvement from the various team members may vary. Some resources might be hired to work with the project with only a small part of their working hours allocated (e.g. 5% of their time) to work on this specific project, which naturally do not encourage ownership.

Lack of ownership to the project may cause various challenges. What the interviewees mentioned as one of the challenges was that every time the involved team member was asked to contribute with something, he/she would need an update of the project. These updates can be quite extensive and takes a lot of time and resources. This goes on the expense of common grounds developed, as every team member is not equally involved in the project's process. To facilitate ownership and a culture inward in the team, some stated that making the project seem attractive was one of the project managers most important tasks. If the project leader succeeds in creating a project perceived as cool and interesting, it will automatically attract the right people wanting to contribute.

With several years of experience behind you, it is easy to say, "but we have been using this solution for years, and it works perfectly". This may be the basis of the next challenge, **tolerance for change.** To be challenged by new people with different backgrounds and new ideas may be difficult for some people, especially if you have a lot of experience. This might not necessarily only be a challenge but also an opportunity, as good solutions often come out as a result of a discussion where people disagree to begin with. What several of the interviewees have experienced is moments when you catch yourself thinking "Why did we not change before?", after being introduced to a better and more efficient process. Although, the path to accept such a change may be more difficult for some than others.

As in most projects **social differences** may cause some challenges, which was mentioned by three of the five questioned persons. Different social background may impact how team members contribute to the project unrelated to their field of expertise, which has the effect that it leaves little room for others to contribute.

The final code is the **use of digital tools** in cross-functional teams working with digital transformation projects. Although this is supposed to simplify things and make processes smoother, that is not necessarily always the case according to the interviewees. An example can be that when given written feedback without the option to immediately ask follow-up questions and express concerns, things can be difficult to understand compared to physical meetings. It was commented that in several instances it would be preferable to have physical meetings to give feedback, rather than using digital tools. What was mentioned numerous times was that the goal must be to use as few digital tools as possible, in order for everyone to

be capable of using the selected digital tools. One of the interviewees mentions that this is not always easy – “it is complicated to do things uncomplicated”, which in many ways visualizes the mentioned challenge. Sharing information from and among different team members can be complicated if that information is shared using numerous digital tools.

5. Discussion

In this section the empirical findings will be discussed and compared to already existing literature, as presented in the theoretical background chapter. The intentions of this is to link the existing theory regarding challenges and benefits of cross-functional teams with the findings from the interviews conducted. The goal is to complement the existing theory. A framework to utilize the cross-functional teams in digital transformation projects will also be presented.

5.1 Critical success factors

Prior to conducting the interviews, a thorough research process carried out, finding what was already considered critical success factors when dealing with cross-functional project teams, but not necessarily in digital transformation projects. In order to tie together the findings from the interviews which maps todays practice and the theoretical practice the existing theory and the findings will be compared. Bishop' article (1999) will be used as the main source of reference.

The following table matches the interviewees' success factors with similar ones mentioned in relevant literature.

Interviewees	Relevant literature
Take time to understand the extent of the project	Project goals/scope/objective (Ehrhardt et al., 2014)
Experienced project leader with knowledge on several fields of expertise	Leadership (Thamhain, 2013), Team authority/autonomy (Thamhain, 2013)
Map out the project to sort out what resources are needed	Project goals/scope/objectives, Membership/resources (Ehrhardt et al., 2014)
Develop ownership to project, include members from day one	Communication (Ghobadi & D'Ambra, 2012), Project ownership (Fernandes et al., 2017)
Day-to-day communication and follow-up	Communication (Ghobadi & D'Ambra, 2012)
Compromise when listening to experts	Team dynamics (Daspit et al., 2013)

As noted in chapter 4, four of the five interviewees stated that **taking time to understand the extent of the project** is a critical success factor for cross-functional teams in digital transformation projects. Particularly in digital transformation projects, all the information in rarely available at an early stage of the project, which makes this process difficult but important. In order to make sure all parts of the project are covered when it comes to resources, it is important to spend enough time actually understanding what the project demands of resources, time and money. Furthermore, this is not only important when it comes to allocation of resources, but also in order for the project to be run efficiently. Clearly defined and understandable objectives are crucial for the project to run smoothly, and that every project member involved acknowledges their involvement and tasks. The importance of the project must be thoroughly communicated throughout the entire project group.

Bishop (1999) mentions **Project goals/scope/objectives** as a one of the key factors of Successful Cross-Functional Project Teams which to a great extent can be tied to the first critical success factor mentioned by the interviewees. This embraces how the objective is aligned with the corporate strategy, whereas the projects' objectives must be connected. The project must be perceived as important and not trivial, which is also mentioned by several of the interviewees. Moreover, Ehrhardt et al. (2014) study can be connected to this point with the fact that they mention how each individual team member must commit towards the goal. They all need to give it their best for the project to be successful. Their findings are in line with what Bishop (1999) mentioned 15 years earlier, showing that project goals and commitment towards such goal is still key in todays practice. Furthermore, **Membership/resources**, also mentioned by Bishop (1999), can be tied to this critical success factor as well. This is also mentioned by Ehrhardt et al. (2014) as a key success factor due to the way resource allocation can have a positive effect on individual team members. The added effect of this is that said team member might get more involved and committed to the project. Moreover, teams typically meet frequently and for a good amount of time when first starting in order to build trust, **understand the project goals and build concrete plans** (Bishop, 1999). Bishop (1999) also mentions that the issue of time effort should not be underestimated here, which can be linked to what the interviewees pointed to. The interviewees, Bishop (1999) and Ehrhardt et al. (2014) all agree on the importance of this success factor.

The next success factor stated by several interviewees is the importance of an **experienced project leader with knowledge on several fields of expertise.** The fact that the project

leader has the necessary and required interest and knowledge is crucial for the quality of the end result. In order to supervise on several parts of the project a certain level of technical knowledge is required, as the project leader should not completely rely on other team members. Furthermore, the importance of having a project leader who is respected and is perceived as an authority is emphasized. If the project leader lacks these attributes, he can risk team members prioritizing other projects and tasks over the given project and members not attending meetings, which can affect the end result. The key attributes of a good project leader in cross-functional teams working on digital transformation is stated to be curious, staunchly and willing to test everything and listen to everyone. According to the interviewees, the ideal project leaders are the ones who dare spend time early on planning and analyzing different outcomes and potential pitfalls.

Not surprisingly, **Leadership** is also one of Bishops (1999) key factors of successful cross-functional teams which is closely connected to the previous success factor mentioned by the interviewees. Bishop (1999) refers to the positive relationship between leadership effectiveness and team interaction and performance, team effort, communication satisfaction, and maybe most importantly the team's ability to coordinate its work activities. This is closely related to the information the interviewees shared, whereas poor leadership may affect how the members relate to the project, and not prioritize it. What is also mentioned in the literature is key attributes of a team leader: commitment to the project, effective leadership skills, and a position of authority. Coordination and organizational skills are also mentioned by both the interviewees and Bishop (1999). These attributed can all be categorized under the category Social Architect, as Thamhain (2013) puts it. He also emphasizes that a project leader needs to be able to foster active participation (Thamhain, 2013). Meaning that the team needs to be involved in most aspects of the entire project and not just the one they know. This makes the team more connected to the entire project and give everyone a broader understanding.

Furthermore, Bishop (1999) mentions **Team Authority/autonomy** which discuss the positive effect internal and external decision-making authority can have on a group. Cross-functionality commits the project leader to rely on other team members, as matters touched often are outside the team leaders' area of expertise. Bishop (1999) and the interviewees agree on the importance of this. Moreover, Thamhain (2013) agrees on this, but more in the sense of tool use. He mentions that the team needs to trust the project leader to do the right thing and

use the right tools best suited for each situation. If they do so, it will build a high level of trust which the project leader again can utilize by using different members knowledge in the project to the benefit of the project result itself.

Four of the five interviewees said that to **map out the project to sort out what resources are needed** is another success factor for the cross-functional project teams working with digital transformation projects. Having a wide scope from the start in order to guarantee getting the needed resources are essential, and with digital transformation projects in particular. One of the mentioned approaches here is to analyze the demands from the customer and what the end result is expected to be. To do this effectively you have to know what resources are available and put together a project team that match the project scope. This process often includes experts from different fields, who can use their knowledge to decide which resources are needed to go through with this project. This was mentioned by one of the interviewees to run the risk of taking too long, exemplified with a current project where it took more than half a year to map out the entire project and recourses needed.

In addition to spend time to understand the extent of the project, this success factor can also be pinned together with **Project goals/scope/objectives.** What is more relevant here is that Bishop (1999) mentions that all individual and group goals must be established and aligned with the ones included. However, **Membership/resources** are more precise to what the interviewees explained. Bishop (1999) claims that adequate team staffing and members with corresponding skills are critical to the success of cross-functional teams of any type. Alike the interviewees, Bishop (1999) mentions the importance of identifying the correct and suitable team members fitting the project. This should be done in cooperation with functional department managers, in order to recognize the matching competence. As well as identifying the importance of suitable team members Ehrhardt et al. (2014) also mentions the positive effect choosing the right team members may have on the team members themselves. Meaning that the effect of how a well-chosen team member might feel extra motivated for the job due to their expertise on the specific project.

The importance of **developing ownership to project and include members from day one** was mentioned by every person interviewed. They pinpointed the challenge related to including members later in the different processes, as it is hard to establish a feeling of ownership when the member has not been involved since day one. This may be perceived as

important in all types of projects but is arguably even more important and harder to obtain when concerning digital transformation. When certain team members are only needed and contributing for a limited amount of time, it is harder for them to establish a feeling of ownership to the project. Lack of ownership may compromise the team members' understanding of the project and effectively the quality of the end result. Some team members will be allowed to allocate only 5-10% of their time on the project and this can create a barrier for people to develop the feeling of ownership required to fully commit to the project. The idea is that it is not necessary for every person to contribute equally from day one, but rather the importance to create a common understanding and consecutive sharing of information. This can also be related to the point of leadership, as one of the interviewees claims that the project leader, to a great extent, can affect how the team members perform. A good team leader will get the best out of all team members.

Bishop (1999) mentions **communication** as an important key factor which is closely related to what is mentioned by the interview participants. What the literature says is that the consistent communication throughout the entire project team is crucial to keep the members dedicated to the project, which can be translated into feeling ownership to the project. This can be compared to what the interviewees said concerning the importance of daily updates, regardless of their actual daily contribution, to establish and maintain the feeling of ownership. However, none of the interviewees mentioned how the aspects mentioned by Ghobadi et al. (2012) effected the communication. With Ghobadi et al. (2012) aspects being those of competition within the team having a great effect on communication. Which in turn is a good thing, because the wrong use of it might have a severe negative impact on the team. Furthermore, Bishop (1999) mentions **Project ownership** as a specific key factor to success which discuss the importance mentioned by the interviewees, to understand the large-scale organizational issues and connect the individual members to the rest of the team and the stakeholders of the company. However, when members are not directly connected to what they work with they may experience competing responsibilities, pushing them away from the project, the goal and maybe worse - the end result. This is also mentioned by Fernandes et al. (2017) as the team needs to understand how upper management has allowed the project to go on. Especially if the project management projects has support from senior management, then this will in turn motivate the project team to become more interested in the project (Fernandes et al., 2017). Which in turn will give a higher sense of ownership.

As mentioned, tightly linked to the previous argument, **day-to-day communication and follow-up** was mentioned as a key factor by the interviewees, which depends on creating common grounds for every member of the team. Everyone need to be aware of the demands, what is the challenge we are solving, what are the objectives, and in this way get everyone involved. This may be especially important for cross-functional teams working with digital transformation, as certain groups are only involved for a short period of the entire project. This makes the day-to-day communication and follow-up even more important when working with digital transformation projects.

The literature defines **communication (**Bishop**,** 1999**)** as one of the key factors to success. Communication is described as a key to manage expectations and minimize misconceptions, which follow-up can avoid. Providing process status throughout the project is described as essential to keep team members involved and dedicated on the project. It is also specified how the importance of the project objectives and scope must be communicated in an appropriate manner, in order for everyone to understand the end goals.

The final success factor mentioned by the interviewees is the ability to **compromise when listening to experts.** When working in cross-functional teams you are often dependent on other peoples' knowledge, and therefore the project relies on coming together and finding the best solution. This often involves compromises, as people like to do it their own way, although someone has more knowledge and therefore can come up with a better or improved solution. One of the interviewees noted that it is important for people to have the ability to say, "this is beyond my field of expertise, and I should let the experts make the decision". Team members must know their role and stick to it.

Bishop (1999) also states **Team Dynamics** as a key factor. What is stressed concerning team dynamics is that open communication and mutual accountability among all team members is crucial in order to maintain respect and trust. This also include how the team deals with conflict and disagreements, and the decision-making should be grounded on facts, data and logic. Bishop (1999) also states that when a person is chosen to do a specific job, he should be trusted to do that job, which is to a great extent comparable to what the interviewee mentioned. However, as Bishop (1999) mentions how team dynamics is a key factor Daspit (2013) suggests that team dynamics in cross-functional teams have an indirect effect. This was not specifically mentioned by interviewees, as they rather stated that team dynamics are

important to be able to efficiently share knowledge and maintain consistency throughout the project. This points towards Bishop (1999) and the interviewees do not agree with Daspit (2013) about team dynamics on the subject of efficiency.

5.2 Benefits of using cross-functional project teams in digital transformation

The table below matches the benefits found from the interviews with benefits from existing relevant literature, where Holland et al. (2000) is the main source, but also from additional relevant literature.

Interviewees	Relevant literature
A functioning solution	Improve time-efficiency (Park et al., 2012) Improve performance in knowledge-intensive projects (Young-Hyman, 2017) Enhance competitive advantages and benefits (Zhang & Guo, 2019)
Locate potential pitfalls	Improve ability to handle complexity (Holland et al., 2000)
Knowledge-sharing across areas of expertise	Foster an entrepreneurial culture Enhance creativity Better quality information at higher levels (Holland et al., 2000) Increase interaction between teams and information exchange (Young-Hyman, 2017) Promote knowledge-sharing (Ghobadi & D'Ambra, 2012) Facilitate generation of new competences (Medina & Medina, 2017)
Wider perspective	Improve ability to handle complexity Enhance creativity (Holland et al., 2000) Widen knowledge diversity (Zhang & Guo, 2019)

Quick problem-solving	Increase speed (Holland et al., 2000)

Two of the interviewees mentioned that a main benefit of cross-functional teams is that the final outcome is **a functional solution**. They emphasized that the use of cross-functional teams in digital transformation is vital when using teams as it is the only way to get a good and functioning solution. If they were to use anything but a cross-functional team they were very adamant about the fact that the project would not have been finalized in a suitable manner, and that the use of cross-functional teams is an absolute necessity when looking at digital transformation projects. However, this is not an element found anywhere in relevant literature. A reason for the lack of literature reference might be related to the fact that it is a very "set-in-stone" way of thinking. Such a view might discourage use of other project methods, because the theory says this is the only way. Nevertheless, this point is still interesting because it gives more insight in todays practice. However, what supports this claim is that relevant literature states that the use of cross-functional teams can improve time-efficiency, performance in knowledge-intensive projects and enhance competitive advantages and benefits (Park et al., 2012; Young-Hyman, 2017; Zhang & Guo, 2019).

One of the interviewees stated that **locating potential pitfalls** early is a great benefit served by cross-functional project teams to improve the ability to handle complexity, which is also noted by Holland et al. (2000). This is a step that was mentioned to be especially effective early in the project process in order to establish clear grounds between everyone involved. The effect of this is the same as mentioned in the literature, which is to help prepare for unforeseen complexity that might occur later in the processes. The interviewees said that they arrange meetings early in the project cycle in order to brainstorm potential problems that might complicate the project later and involve several project groups. The importance of this, concerning cross-functional teams, is that people with different backgrounds might have different insight in how to solve such a complexity. However, if the project leader has prepared the team's ability to handle these pitfalls in a similar manner, the team will always be on the same page on how to handle the situation, regardless of what role they may have in the project.

Knowledge-sharing across areas of expertise is often the first thing that comes to mind when thinking about cross-functionality and was mentioned by two of the attending

interviewees. Mainly because of how cross-functionality work in general, with everyone involved in the project feeding off each other's knowledge in order to get the best possible end product. This also fosters an entrepreneurial culture within the team that can result in two main benefits, first of which being an enhancement of creativity. Because entrepreneurial culture wants to emphasize the use of new ideas in order to solve the problem, and with the use of cross-functionality the insight one gets from other areas of expertise can greatly improve one's own way of thinking. This also ties into the second main benefit of such an entrepreneurial culture which is that it ensures better quality information at higher levels. In order for such a culture to function well there needs to be a clear level of quality information that is transmitted. If not, the users of the information might not be correctly informed, which in turn might affect the final solution negatively. Benefits related to this is mentioned in several articles and relevant literature (Ghobadi & D'Ambra, 2012; Holland et al., 2000; Medina & Medina, 2017; Young-Hyman, 2017).

A benefit mentioned by every interview participant is the **widened perspective** that comes as a result of the use of cross-functional project teams. When working together with people possessing different backgrounds and areas of expertise, every member is exposed to new information, points of views and knowledge which can give them insight and perspectives they did not possess previously. This can improve the entire team's ability to handle complex problems and projects. If a team consist only of people thinking alike, there is nothing disrupting the thought process and therefore no need to specifically ask anyone for their opinion. This in turn can boost creativity, because it gets people thinking outside their own areas of expertise, which makes them consider different perspectives and possibly finding the best solutions. This point is commonly mentioned in relevant literature, related to improving ability to handle complexity, enhance creativity (Holland et al., 2000) as well as facilitating for knowledge diversity (Zhang & Guo, 2019). Similar to what is mentioned by the interviewees, Zhang & Guo (2019) claims that diversified knowledge resources enhance the epistemic and learning motivation to process information. This motivation can furthermore stimulate the autonomous development and thus lead to improved performance in the team.

Lastly, one interview participant mentioned the benefit of **quick problem-solving**, which ties in with Holland et al. (2000) mentioning that increased speed is one of the main benefits of cross-functionality. This has to do with the fact that all the needed expertise is within the team and there is no need for outsourcing further expertise. Because of this there should be no

lengthy process needed to pass on such information. However, the increase in speed and in-house flexibility is reliant on the fact that people with different expertise is on the same page regarding communication, roles and desired final solution. Meaning that the increase in speed might not be noticeable unless there are clear communication guidelines established.

5.3 Challenges of using cross-functional teams in digital transformation projects

The table presented below shows the challenges mentioned by the interviewees, matched with challenges mentioned in relevant literature.

Interviewees	Relevant literature
Communication	Conflicting organizational goals Overlapping responsibilities No clear direction or priorities (Holland et al., 2000) Knowledge integration (Huang & Newell, 2003) Multiple reporting relationships (Simsarian Webber, 2002)
Project leader	Team leader selection No clear direction or priorities (Holland et al., 2000) Participation in the team selection process (Simsarian Webber, 2002)
Balancing the team	Lack of co-operation (Holland et al., 2000) Cooperative effects and capabilities overlap (Hsieh, 2010) Coordination between workers with different sets of specialized knowledge (Young-Hyman, 2017) Difficulties utilizing full performance potential due to the members' unique characteristics (Simsarian Webber, 2002)

	Team diversity (Oliveira, Pimenta, Hilletofth, & Eriksson, 2016)
Developing ownership	Conflicting organizational goals (Holland et al., 2000) Period of performance of members (Oliveira et al., 2016)
Tolerance for change	Dysfunctional conflict (Holland et al., 2000) Inability to cope with change consistently and successfully (Huang & Newell, 2003) Diversity of ideas among members (Oliveira et al., 2016)
Social differences	Conflicting organizational goals (Holland et al., 2000) Relationship conflict (Huo et al., 2016) Functional diversity (Simsarian Webber, 2002)
Use of digital tools	

What was mentioned by every interviewee was the importance of **communication** and what a challenge it can represent in a cross-functional project team. Although a project team seldom exclusively consist of people with a similar background, the cross-functionality makes communication more challenging. The communication challenge here often relates back to people who are not used to working with each other are combined in teams, which makes the issue of creating common grounds for goals, objectives and aims more important. The different human resources are dependent of each other, which makes communication crucial in order to end up with a good result and ensuring adequate time and resource scheduling. As the project leader does not necessarily have the knowledge and experience to allocate the right amount of time and resources to every specific process, it is important that every member has an overall understanding of what the project involve. As mentioned, one of the goals of using communication as a tool is to establish a common understanding of what is expected throughout the project.

Relevant theory mentions the risk of creating conflicting organizational goals**.** The reason why this has to do with communication, is that according to Holland et al. (2000), a lot of

team members do not fulfil their project responsibilities due to lack of time and resources. With poor communication within the project team the project run the risk of team members not seeing the full picture and end goal, which may cause conflicting organizational goals within the group. The team must establish common grounds with regards to objectives and goals, if not one may end up working against each other. This is based on the fact that employees usually socially and psychologically identify more strongly with their function than with the organization as a whole (Holland et al., 2000). The real challenge is therefore to adequately express the difference between team goals and functional priorities, and what to prioritize. In order for this to be done successfully knowledge integration is required, as members must understand several aspects of the project, not necessarily just the one they are involved in (Huang & Newell, 2003). Furthermore, multiple reporting relationships may also create pressure and conflict within a project team, whereas members may feel confused of who to report to, who are eligible to take decisions, role conflicts and ambiguity. These are challenges often found in cross-functional teams (Simsarian Webber, 2002) mentioned both in relevant literature and by the interviewed participants.

Multiple reporting relationships segue to overlapping responsibilities, which may cause obstacles as a result of insufficient communication. If not communicated properly, members do not know who are and who are not eligible to make decisions affecting their function in the project. Although Holland et al. (2000) do not mention communication specifically as a cross-functional obstacle, these two points can be translated into what was mentioned by the interviewees. This also affects the point of no clear direction or priorities, which in addition can be directly linked to communication. When working with daily tasks and objectives, things are more predictable, and people know what to do and prioritize. This does not necessarily count when working on projects, where people, tasks and objectives are less familiar.

Moreover, this takes us onto the challenge of having a **project leader** fulfilling all the demands. The interviewees all mentioned that the project leader must have interest, knowledge and experience from several fields, especially concerning what the project touches upon, in order to improve engagement from team members and to improve the end result. Authority and respect are also mentioned as important factors in order to make a good project leader. One of the interviewees mentioned that the project leader must have the authority to say what must be done by who. This is the solution to one of the challenges mentioned in the

literature, of no clear direction or priorities**.** The team leader should not be afraid to take action and delegate tasks beyond his field of expertise. This should be done through consultation with field experts. What Holland et al. (2000) also mentions is the background of the team leader. What focus should the team leader have when it comes to managing the challenges related to cross-functionality? To what extent should he be involved in every technical decision etc.? Relevant literature also expresses the importance of the team leader engaging in the team selection process. It is important that the team leader is able to affect the processes and outcomes of the team prior the forming of the team (Simsarian Webber, 2002). It is important that the team leader is able to affect the processes and outcomes of the team prior the forming of the team (Simsarian Webber, 2002).

Four of the participants mentioned that creating a **balanced team** can be a great challenge in cross-functional teams. Not only is it important to find team members matching the knowledge required by the project layout, but also making sure that the team is sufficiently cross-functional. This is a challenge frequently mentioned in the relevant literature concerning utilizing the capabilities and knowledge potential, ensuring team diversity and coordinate tasks between the team members (Hsieh, 2010)

As mentioned by several of the interviewees **developing ownership** can be a great challenge in cross-functional project teams mentioned by every person interviewed. Lack of ownership among the team members may compromise on the quality they deliver and potentially the end result. This is especially challenging for cross-functional teams and digital transformation, as some of the team members are only engaging during a short process throughout the entire process. This can be linked to the conflicting organizational goals mentioned in relevant literature. Not feeling ownership to the project may cause members to prioritize different, which could result in conflicting organizational goals (Holland et al., 2000). The period a member participates in the project also play a big role when developing ownership to the projects, as mentioned by the interviewees. As members are selected based on their skills and abilities to contribute to a specific project, some will work until the end of the project, while others will contribute for a short period of time. This may cause challenges related to learning and sharing, due to lack of familiarity among members and lack of feeling of ownership to the project (Oliveira et al., 2016).

Teams generate their own identities and loyalties based on what they identify with, and that may not necessarily be what the project represents. Additionally, three of the five interviewees said that **tolerance for change** was a challenge. Understandably, a lot of people are comfortable with the way things are running, especially if the solution used today works. A common mindset is "*if it works, don't fix it*", which may create a barrier to change and solutions proposed by others. This may create what Holland et al. (2000) refers to as dysfunctional conflicts, which opposed to functional conflicts makes team members withhold information to avoid change and create obstacles in the decision-making process. This kind of behavior is obviously challenging when working in project teams, it is therefore important to establish a culture with tolerance for change, where the team members are on board on what is happening and the changes it includes. Furthermore, the ability to cope with change in a consistent and successful manner is also a mentioned challenge, due to initiative overload (Huang & Newell, 2003).

What is also relevant to this is the **social differences** encountered within cross-functional project teams. Holland et al. (2000) claims that socially competing identities and loyalties may be challenging in a cross-functional team working on the same project. As teams naturally create their own characteristics and loyalties, conflicts within the teams may develop (Holland et al., 2000). The interviewees mentioned that like in most situations where several strong personalities are involved, a lot of strong voices want to influence their area of expertise. Relational conflicts may be a big challenge in project work, as team members may become uncooperative and involve themselves in meaningless struggles in turn influencing their integrated goals and project performance (Huo et al., 2016). Furthermore, cross-functional structures can pose challenges to individuals who work together despite having different goals and values (Simsarian Webber, 2002)

Finally, several of the interviewees mentioned the use of **digital tools** as a challenge, which can be linked to the tolerance for change. This point was not mentioned in relevant literature, as it may be a quite new challenge.

5.4 Relevance for digital transformation

What has become clear throughout this chapter is that although all the questions were specifically asked from a digital transformation point of view and every participants'

experience mainly comes from digital transformation projects, the applicability may reach beyond this type of projects. This has become clear as well through comparing the findings with relevant literature on cross-functional project teams in general, as several things are similar or at least comparable.

Despite several success factors, challenges and benefits being similar, some may be more prominent or important when concerning digital transformation projects than other projects. What was mentioned as very important with digital transformation projects was to take time to understand the extent of the project being undertaken. This process is not unique for digital transformation projects, as all projects demand start-up planning and organizing. However, this part is arguably even more important for digital transformation projects, as phases are unpredictable and may change throughout the span of the project compared to more traditional projects (Vey, Fandel-Meyer, Zipp, & Schneider, 2017). As several parties who seldom interact with each other are involved, it is crucial to identify and involve the members the project requires at an early stage. This also ties to the general project-necessity of developing ownership among the team members. This is mentioned in relevant literature regarding project management but may be even harder to establish in cross-functional project teams regarding digital transformation. The interviewees mentioned some members only being involved for short periods of the full span of the projects, which makes it challenging to establish a feeling of ownership to the project, which again may influence their commitment and engagement of creating the best solutions possible.

Furthermore, the impression given by the interviewees is that there are more demands concerning knowledge and skills possessed by the project leader for cross-functional digital transformation projects than traditional projects. As digital transformation projects often touch upon a lot of different areas, the project leader needs both a professional and a technical understanding of the extent of the project. Although leadership is mentioned as important in relevant literature, it is in a more general manner related to culture, communication and team interaction. This also connects to the point of day-to-day communication and follow-up, which is also mentioned to be particularly important in digital transformation projects. Thus, communication is important in any type of project, but the interviewees present this matter more focused on making sure every single member of the project team is kept in the loop, regardless of their current involvement.

5.5 Framework for use of cross-functional project teams in digital transformation

Based on the research presented above the following framework for cross-functional project teams working with digital transformation is suggested.

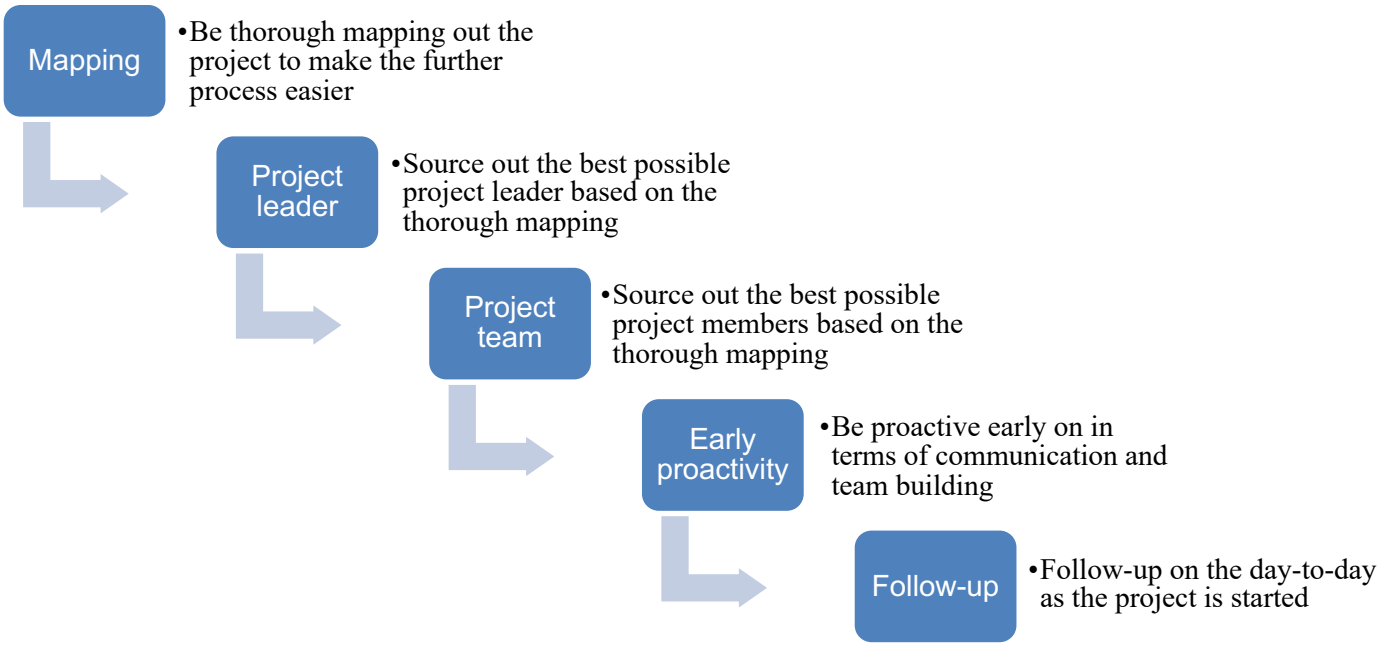


Figure 9: Framework for use of cross-functional project teams in digital transformation

The framework suggests a five-step process as shown above. The first step is the project mapping process. The mapping step is there to account for a key success factor that tells us to map out the project to sort out what resources are needed. This is a key step as it is also the basis for rest of the framework. Therefore, it is emphasized that the mapping process is done thoroughly in order to early on overcome unforeseen complexities. Meaning that a thorough mapping process also accounts for the aspect of locating potential pitfalls. However, the mapping process also has the added benefit of ensuring that the proper project leader is chosen based on what is needed related to both expertise and leadership skills.

This leads to the second step which is to select best possible project leader based on the detailed mapping. Finding the best possible project leader is essential in order to get strong leadership to control the entire project. It is also important that the project leader has some expertise related to most, if not all, of the desired fields needed. However, the project leader needs to associate itself with the project plan that has been mapped out. This is to ensure that the project leader is aligned with what the customer desires from the final product.

Furthermore, the project leader needs a project team, which is the third step. Finding the best possible people with the needed expertise mapped out. In this step it is important to consider how many project members and what type of background the potential members should have. However, it is also important to involve just enough people to cover the needed expertise to avoid the team becoming too large and consequently falling out of control. The larger the team, the harder it is to get everyone committed to the mapped-out plan and for the project leader to control.

Leading to the fourth step of being proactive early in the process in order to get the team all committed and establish ownership. This might just be the most important step as it accounts for all further communication problems, knowledge-sharing problems, team dynamic problems, ownership, and conflicting organizational goals. We look at this as a planning step, as it is vital for the project work in that it creates and establish clear boundaries for the project members. Mainly in the ways of the previously mentioned challenges. However, this step is also crucial with regard to the benefits of a cross-functional team in that it widens perspective, making it easier to communicate knowledge-sharing and making problem-solving easier. This is due to all project members knowing the ways of communication, ways of thinking of others and what expertise the different project members possess.

Following the planning stage, the whole team is committed and knows what has to be done, it's time to start the project. This leads to the fifth and final process: follow-up. This is an important step as it ensures that everyone keeps up with the established ways of communicating and the goal of the project. It makes sure that all the planning done beforehand has not been for nothing. However, if there is something largely unforeseen that needs to be accounted for this is the process that will capture such unforeseen elements. In such instance's management needs to find a solution alongside the team in order to ensure that the problem is resolved in the best possible way.

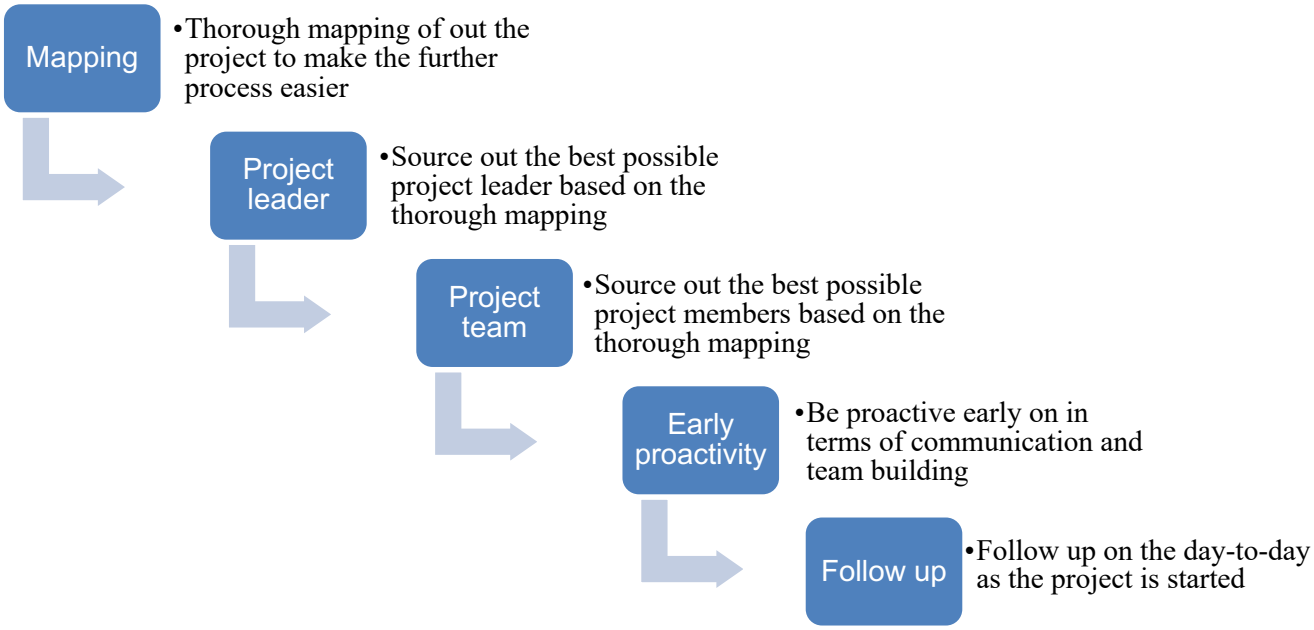
6. Conclusion

The purpose of this chapter is to establish an overview of the main findings generated throughout the thesis and align these with the research question raised.

Relevant literature concerning project-work and digital transformation mentions the use of cross-functionality as a common and well-recognized challenge, which created the base of the research conducted in this thesis (Ghobadi & D'Ambra, 2012; Shivakumar, 2018; Wysocki, 2019). This challenge is what the thesis is researching, with focus on projects concerning digital transformation. Digital transformation projects can be defined as software projects and implementation of these in organizations. The aim with this is to bring agility into the business processes and making the business more adaptive to change (Shivakumar, 2018). In these types of projects particularly cross-functional project teams are essential, as knowledge from several fields are necessary. What defines a cross-functional project team is that it is put together of individuals drawn from different functional units possessing different skill sets and knowledge relevant to completion of the specific project.

The fitting approach to this particular research question was found to be exploratory qualitative design, conducting interviews with people from different backgrounds and roles within digital transformation projects. The interview participants were questioned about their experience with relevant projects, what they characterized as critical success factors, benefits and challenges concerning cross-functional projects. Furthermore, the data collected from these interviews are bridged to relevant literature found prior to conducting the interviews.

The key findings can be summarized through the framework created after conducting the interviews:



This framework is based on the critical success factors, benefits and challenges mentioned by the interviewees, combined with relevant literature.

6.1 Research contribution

The main purpose of the thesis was to link the research question and todays practice with existing theory with focus on digital transformation projects. The main contribution of the research is presented in the framework, which summarizes the most important processes of a cross-functional project team working with digital transformation.

6.2 Limitations and future research

The most obvious and critical limitation for the research has been the COVID-19 outbreak, which made the data collection a lot more difficult and limited. Several of the companies and individuals we were in contact with cancelled the planned interviews, as they have gotten more important issues to deal with, and interviews were not prioritized. However, we managed to conduct five interviews from two different organizations with people with very different backgrounds both from public and private sector, which established a good basis for the interviews. In addition, libraries have been closed for a period of time due to the COVID-19 outbreak, which limited access to books and literature. Thankfully, most of the literature was collected prior to this these circumstances, but this needs to be mentioned and factored in.

Thus, future qualitative research on this matter could be enhanced through conducting more interviews with more individuals with various backgrounds. In addition, all the interviews were conducted using Microsoft Teams, although we would have rather liked face-to-face interviews in order to avoid conceivable misunderstandings.

Moreover, although the research question focuses on the use of cross-functional teams specifically working on digital transformation projects, many of the findings have turned out applicable not only to this type of projects. The interviews were conducted in a manner where there was no doubt regarding what type of projects the questions were concerning, and most of the interviewees had sole experience from digital transformation projects. Nevertheless, some of the findings would not exclusively count for digital transformation projects, but also for other types of projects. This is difficult to avoid, as projects will have several similarities regardless of the type of project. However, we consider that all findings are applicable for the researched area, but not necessarily exclusively.

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Appendices

Appendix 1: Interview guide

Introduction

1. What is your knowledge regarding project work and different approaches to project work?
2. What type of experience do you have with projects concerning digital transformation and what are the main challenges related to it?
3. What type of digital transformation are you involved in now, and what type of digital transformation projects have you been involved in?

Map todays practice

4. What type of project management approach do you and your organization practice today?
5. What are the main benefits with using this approach?
    - opposed to traditional project management?
6. What are the main challenges with using this approach?
    - opposed to traditional project management?
7. What improvements could have been made to make the approach fit better to projects regarding implementation of digital solutions.

Cross-functional project teams

8. What type of professionals does a typical digital transformation project consist of?
9. What measures are taken into account when such a team is put together?
10. What are the main challenges/benefits of working with a team consisting of people with different functional expertise when working on digital transformation projects?
11. Is there an alternative approach to this type of work, besides from through projects?

Appendix 2: Reflection Note, Håkon Bore Haaland

Summary

The subject of the master thesis is project management, and more specifically the use of cross-functional project teams working with digital transformation projects. Furthermore, the research question is "What are the benefits and challenges of using cross-functional project teams in digital transformation projects?". The methodology used is exploratory qualitative, and interviews with 5 different individuals with different roles in project work were conducted. For example, a project leader, a developer, and an administrative role were represented from both private and public sector which gave the responders a wide range, whereas all of them are or have been working on digital transformation projects. We were planning on conducting more than the five interviews, but due to the COVID-19 outbreak several interviews were cancelled by the companies. Due to the same reason all the interviews were conducted through MS Teams, and not in person. It would be preferable to conduct more interviews in order to get a wider database, but despite only conducting five we still got a lot of correlating data pointing towards a reliable result.

In order to find the benefits and challenges of using cross-functional project teams in digital transformation projects, we used the collected data to compare with relevant literature both regarding digital transformation projects and the use of cross-functional teams. The aim was to get a wide perspective of this, and not specifically one specific role's perspective, in order to come up with the best solution of how to conduct digital transformation projects. Our findings are summarized in a framework made based on the greatest challenges, benefits and critical success factors, and are tied up to already existing literature. The findings are that there are some different and some similar factors that has to be taken into accounting when working with digital transformation projects, rather than traditional ones. Although some of the things mentioned by the interviewees can be tied up quite closely to things mentioned in relevant literature, there are still differences linked to the unpredictability of these projects.

Internationalization

Digital transformation is a very current and relevant subject, which affects a lot of companies worldwide. It is by many perceived as a must to engage in this, in order to keep up with the market and the changes happening around them. Cross-functional teams opens up to include professionals with several different backgrounds to co-operate to find the best solution for the

project. Moreover, this may create relationships and solutions never thought of before and is applicable across borders.

Digital transformation processes are something companies must go through, regardless of where in the world they are situated, as everyone has to adapt, overcome and make their processes more effective. Although all the interviewees were Norwegians working for Norwegian companies or organizations, projects are somewhat similar everywhere, hence the findings will be applicable for companies outside of Norway as well.

The organizations the interviewees represented are to a great extent influenced by international forces, as foreign companies call for domestic companies to digitally transform too. If they do not keep up, foreign companies will deliver more effective and better products, and outperform the companies not keeping up.

Innovation

As mentioned, digital transformation and the making processes more effective through the use of digital tools is more relevant today than ever, and the use of cross-functional teams are according to our findings the best way to do it. Another reason why this subject is closely connected to innovation is the applicability, as most companies can benefit from digital transformation in one way or another.

Digital transformation may involve software development, implementation of software, making documents or forms available on digital platforms etc., in other words using technology to make processes more effective and less time-consuming. Digital projects are for example projects using modern day technologies such as experience platforms, commerce products, big data technologies, application programming interface (API) and AI technologies (Shivakumar, 2018). Our interview participants had been involved in projects concerning development of AI chatbots, APIs and other digital transformation projects.

These are all solutions closely tied up to the use of cross-functional project teams, and more and more companies choose to utilize this in order to deliver products and services effectively.

Furthermore, the use of cross-functional teams is also claimed to encourage knowledge and sharing of ideas, which in turn enhances innovation. Not only does the thesis relate to innovation through researching digital solutions, but also through the research of the use of cross-functional project teams.

Responsibility

A lot of digital projects include the collection of a large amount of data from a large amount of people, which results in a great responsibility concerning collection, saving and the use of the collected data. This may be more relevant today than ever, as laws concerning the management of personal data are prominent. Despite the increased focus on this, people in general are quite inclined to accept user terms and conditions without necessarily reading through them. In addition to this, digital transformation may also create a threat to positions being replaced by a digital solution, and the companies may be obliged to create new positions.

At least for organizations operating in the EU, the General Data Protection Regulation (GDPR) is applied when managing personal data. When businesses operate with offices and affiliates across borders it is important to have consistency concerning the protection laws and rights for both the organizations and the individuals. The interviewed participants had been involved in projects concerning digital forms collecting different data such as travel expenses, salary, tax etc., as well as the use of chatbots. Collecting these types of data is a great responsibility which calls for clear guidelines and routines concerning how it is collected, processed, managed, saved and deleted.

As noted above internationalization, innovation and responsibility are all factors prominent in the thesis and is undoubtedly a current and up-to-date research question. International, as organizations must make up one’s mind regarding digital transformation regardless of where they are situated, innovation as digital transformation is a step towards innovation and cross-functionality contribute to innovation and lastly responsibility as digital projects often include collection of personal data.

Appendix 3: Reflection Note, August Fløgstad

Summary

This master thesis looks at the topic of project management focused on digital projects. Through the literature review we found a special interest in the aspect of cross-functional teams when working with digital transformation projects. From there on we established the research question *"What are the benefits and challenges of using cross-functional project teams in digital transformation projects?"*. There was conducted five individual interviews with all the interviewees having a different role in project work, such as a project leader, a it-developer and a administrative team member. Furthermore, all the interviewed people were currently working on a digital transformation project and had also previously worked with digital project of a similar nature. This give the collected data a wide perspective of the use of cross-functionality in digital transformation projects. However, due to the outbreak of COVID-19 in winter 2020 a lot of already planned interviews fell through. Meaning that we planned to have more than five, perhaps something like 10-13 would have been preferable. A consequence of this was that all the conducted interviews was done through the use of Microsoft Teams which in turn made the interviews loose some of the personal aspects of interviews. Nevertheless, the data collected all pointed in the same direction regarding challenges and benefits of cross-functional teams.

We found the data pointing in the same direction by analyzing all the data and compare the data to the already established literature. we used both literatures revolving digital transformation projects and cross-functional teams. After this process we understood the aspects of the use of cross-functional teams in digital transformation projects to the point where we made a framework on the use of such teams. This framework summarizes our findings based on the benefits, challenges and critical success factors. However, after making the framework and double checking our findings and discussion we found at that the framework is not only applicable for use in digital transformation projects, but rather in most projects in need of cross-functional teams. This gave us an understanding that cross-functional teams might just be the main factor in such project work due to the challenges and benefits a cross-functional team brings.

Internationalization

Looking at our research question there are mainly two aspects to look at, the two being cross-functionality and digital transformation. Where the aspect of cross-functionally is more effecting internationalization rather than getting effected by it, meaning that the use of cross-functional teams crosses boarders due to the outsource of the best possible expertise. This may therefore have the effect of making people travel and get transferred across the globe. Whereas digital transformation is something that gets more effected by internationalization, rather than effect it. This is mainly due to how important most companies around the world finds this topic, as it is crucial to be on top of digitalization. If one is not with the times the consequences might be a drastic fall in profits and longevity of the company.

As mentioned, the COVID-19 outbreak flatlines most of our interviews, making it so that we only interviewed people from one company. However, this company is, as most companies, greatly affected by the ever-growing importance of digital transformation as they also need to keep up to date. If they were to fall behind on these stages I find it hard to believe that we would have got in touch with them, as they might not have been as interesting in our eyes. Even though all the interviewees were Norwegians working in a Norwegian company their situation is still applicable for every other larger cooperation in the world, regardless of where they are. Its about keeping up with the digital innovation and being efficient.

Moreover, I think our findings are highly affected by international forces in that it's an evolving practice. Meaning that the more globalized the world becomes the more effective ways of managing cross-functional teams must get. It is important to understand how such a team can benefit of each other, and that this is not just a domestic issue but rather a global. And in my opinion project work might be the best solution to the problematic digitalization question, with cross-functionality being a core aspect. So, because of this correlation of cross-functionality in my opinion being the core to digital project work this has a global impact due to everyone having to adapt to the digital innovations. Which in turn leads to a more efficient and, hopefully, less wasteful system.

Innovation

I think that there is room for improvement regarding both cross-functionality and digital transformation. When looking at cross-functionality I think that there is a potential in the way people in general think about the topic. Throughout working on the thesis, I have felt that there has been a lack of general understanding of the benefits of cross-functionality. This may

be one of the biggest challenges in my eyes as it results in communication- and cooperation problems, since people might not want to work with someone with another background. However, this in turn is why we also need some innovation towards how to quickly fix and establish the correct boundaries in the team.

In regards of digital transformation, I think we constantly see improvement in the tech department, however, there needs to be a lesser gap between the newest developments that needs to be implemented. Digital transformations are very costly and can not be done in the tempo that are currently expected. A solution here might be some payback system for implementing a newer and better system. But also, perhaps give out these improvements in iterations so that they are not to cluster the demand side.

Responsibility

When writing a master thesis there are concerns that needs to be accounted for, one of which is the concern of anonymity. The thesis is a piece of literature that is supposed to bring the understanding of topics further, and not out someone's practice. In the case of this thesis we made sure to make it clear towards the interviewees that everything was going to be anonymous. Furthermore, we emphasized that the recordings of the interviews would only be used by us and for the purpose of this thesis. I feel like this might have helped the individuals relax more and give even more honest answers as they knew they could speak freely.

Moreover, on the aspects of responsibility and how it affected our thesis I, yet again, that think COVID-19 must be mentioned. We wanted to conduct the interviews face to face, but due to the outbreak we quickly felt like this would not be possible. We reached out to the companies that had agreed to be interviewed and asked them what they thought was the best decision. This unfortunately led to a company having to cancel, which was understandable under the circumstances. However, the other company was grateful for us being proactive and quickly found a good solution to the problem.

All in all, I feel like the three themes of Internationalization, innovation and responsibility has been prevalent throughout the process of writing this master thesis. Obviously, all of the tree themes are highly relevant for the entire world in the future, but then to different degrees depending on what part of the world. I think that emphasizing on these themes give a broad

understanding of how things work on all levels. Furthermore, these themes are not nearly fully discussed, and will most likely ever be.