Change management within
digital transformations

A study on how to manage a digital change project

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Abstract: This study addresses the issue of a high failure rate for digital transformations and the neglect of working with social aspects of technological changes by answering the question How can organizations work with change management within a digital transformation project to facilitate a change? The study follows a qualitative approach where a case study involving interviews was conducted at a globally leading manufacturing company within the automotive industry. The case study investigated a project which involved a new production concept with new technology and methods of working, which has inspired further projects and started a digital transformation journey at the case company. The topics highlighted in this study involve how people perceived resistance and readiness within the project, leadership, and how the digital change was designed. The study concluded: 1) the environment of the change does not necessarily affect the chosen approach 2) technology characteristics set scope and time frame, 3) analyzing people’s previous change experiences and ensuring voluntary participation may reduce resistance, 4) both task- and people oriented leaders are necessary, 5) digital projects may benefit from ensuring autonomy and a distance to hierarchical structures, 6) a digital strategy must be clearly formulated and communicated, and 7) both a project- and change management model should be adopted. Further research needs to be conducted on projects in different practical settings and conditions.

Keywords: change management; digital transformation; resistance; readiness; automation; digital change
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1. Introduction

Organizations today are under pressure from the changing environment, where global trends such as digitalization entail constant changes which affect the conditions for how organizations should run their business (Hallin et al., 2020). For instance, Industry 4.0 affects almost all industries, where production and logistics are affected, and new connections to technology within the physical and digital worlds have been created (Robert et al., 2022; Molino et al., 2020). Furthermore, the technology advancements implies that changes are occurring fast, and that the competitiveness is rapidly increasing for organizations on the market (Hanelt et al., 2021). In other words, digitalization is a large factor of change which affects multiple parts of an organization, where digital transformations include e.g., changes of professional roles, methods of working, and the market (Sjöberg, 2021). The biggest cause for these changes often depends on how the digital technologies in the organizations have been implemented and how the management has managed the digital changes (Lau & Höyng, 2022). Thus, organizations need to learn how to manage changes which arise from both internal and external causes, and change management is increasingly important to work with (Dempsey et al, 2022; Hallin et al., 2020).

The relevance of working with change management in connection to digitalization is highlighted by Imran et al. (2021) who conclude that digital transformations often fail when only the technological aspects are addressed. Meanwhile, change management involves focusing on the human aspects of a change initiative, where focus is on analyzing behavior and identifying how individuals can change to achieve new results (Bellantuono et al., 2021). Furthermore, resistance against changes often arise when implementing digital transformations due to individuals feeling threatened by the changes (Robert et al., 2022). For instance, individuals may resist changes due to lack of trust to their leader (Kane et al., 2017), receiving unclear directives, bad support, poor communication, and lack of commitment (Bellantuono et al., 2021). Resistance can thus be addressed by working with change management within a digital transformation. Another factor as to why digital transformations often fail is due to a lack of proper digital strategies, knowledge and understanding when implementing digital tools (Kane et al., 2017). In other words, it is relevant to study how to successfully manage a digital change by working with change management within digital transformations.
1.1. Problematization

A relevant industry to study digital changes within is the automotive industry, where the digitalization already has led to an increase of digital content within the products and production processes (Bossen & Ingemansson, 2016). Researchers such as Drahokoupil (2020) claim that the automotive industry is at the forefront of technology introductions, for example with technologies such as industrial robots. Thus, this study will focus on the automotive industry. Furthermore, there is a failure rate of between 66% to 84% for digital transformation projects (Correani et al., 2020), and there already exist several studies focusing on factors as to why digital transformations fail (Jones et al., 2021; Gupta, 2018; Mielli & Bulanda, 2019). Thus, it is relevant to study success factors for managing a digital change. Furthermore, specific practical implementation cases involving digital transformation are relevant to investigate as Bellantuono et al. (2021) state that the existing theoretical models for working with digital transformations mainly focus on strategy and not the implementation phase. Therefore, it is relevant to study practical examples on digital changes within the automotive industry with a focus on how digital transformations can successfully be implemented and managed by working with change management within a project - which leads to the research aim of this study.

1.2. Aim and research questions

The study aims to investigate how an organization in the automotive industry can successfully manage a digital change by working with change management in relation to a digital transformation project. Thus, the study addresses the following research question:

- How can organizations work with change management within a digital transformation project to facilitate a change?
2. Theoretical framework

The structuring of the theoretical framework is inspired by Hallin’s et al. (2020) conclusion that managing a change project relates to questions regarding identification of important actors, planned activities and communications for the change initiative and the goals of the change. Hence, this section first presents an overview of change management and digital transformation as an introduction to the concepts, highlighting relevant aspects to be aware of when working with digital change projects. Thereafter, how to approach managing digital change projects is described by addressing the following three areas: 1) individuals (important actors), 2) leadership (communication and important actors), and 3) designing a digital change project (planned activities and goals of change). At last, a visual representation of the theoretical concepts and their connections is presented, in the form of an analyzation model, to highlight how the main concepts of the theoretical framework relate to one another.

2.1. Change management

Change management is used when referring to working with changes of individuals’ behavior and in capturing value of changes being made (Hallin et al., 2020). It involves analyzing how projects are initiated and structured, and how individuals are supported to successfully adapt to new changes. Additionally, it involves looking at an organization’s ability to adapt to changes continuously (Payne et al., 2022). However, the approach of how to work with change management differs depending on the nature of the changes in focus. Thus, it is important to identify the characteristics of the changes in focus, to ensure that the right strategic perspective is used when adopting suitable models and structures, and to get an overview of what needs to be changed and ensure that resources are enough (Hallin et al., 2020).

Changes can generally be described as a change of work activities or tasks, roles, processes, structures, or values from an organizational perspective (Mabasa & Flotman, 2022). Although, the nature of a change can be described in terms of different characteristics and the situations it originates from. In terms of time and volume, changes can be described as incremental or radical. Incremental changes refer to smaller gradual changes often occurring over time in local stable environments, whilst radical changes are large-scale, drastic changes happening over a shorter time frame in an unpredictable environment (Feng et al., 2016). Regarding predictability, changes can be described in terms of planned or unplanned change (Jager et al., 2021). The predictability and change characteristics depend on the environment surrounding it, which according to Boonstra (2022) can be described as simple, complex, or dynamic.

In simple stable environments developments are clear and future scenarios predictable (Boonstra, 2022), which fits a planned change strategy where management initiates the change (Jager et al., 2021). For changes concerning a more complex or dynamic issue, where many developments are occurring at the same time, influencing one another, are more
continuous, and the predictability is less certain, an organizational change perspective may be more effective (Boonstra, 2022). An organizational ability to change refers to how well an organization can adapt to changes, and how to create an organization with the right competence to work with both continuous and planned changes efficiently (Hallin et al., 2020). In conclusion, based on the identified characteristics and environment of changes, different approaches are suitable.

2.2. Digital transformation

Digital transformation has a broad perspective of how organizations can adapt to new technology (Imran et al., 2021). For instance, digital transformations involve changes in working methods, business offers, and professional roles due to implementation of digital technologies. Thus, digital transformation is about organizational change (Hanelt et al., 2021), rather than only addressing a specific technology. Thereby, digital transformation is a combination of advanced social systems and digital technologies, which enables improvements on business ideas by better services, products, customization, new business processes and innovation (Imran et al., 2021; Molino et al., 2020). Furthermore, the digital transformation process can be explained as an interactive process where participants need to adapt to the digital changes quickly and leverage digital technologies to their workplace (Schneider & Kokshagina, 2020). Often a digital transformation involves radical- and incremental innovations, where radical innovations refer to bigger changes which can be disruptive so that an existing product or method becomes obsolete, and incremental innovations refer to improvements of existing products or methods (Liu et al., 2022). Examples of innovations can be found when looking at technologies developed under the concept of Industry 4.0, such as the Internet of Things (IoT), big data and advanced robotics. These can all be explained as technologies involved in different digital transformation processes.

Thus, digital transformations may involve different levels of digital technological advancements, which impacts the competences and skills of the human workforces on different scales (Balsmeier & Woerter, 2019). For instance, implementation of machines empowered by data access, computation and communication technologies involves bigger impacts on competences, whilst non-machine-based technologies have little to no impact (Balsmeier & Woerter, 2019). For example, IoT and integrated systems which require knowledge of how to utilize the specific technology implies a larger digital transformation than implementation of an Enterprise Resource Planning (ERP) system which is adopted easier and complementary to (not substituting) the existing processes (Balsmeier & Woerter, 2019). Additionally, Kadir and Broberg (2020) states that a software-based digital solution is quicker and more straightforward to implement than a combined software and hardware based digital solution. Meaning, the complexity of a digital solution influences the timespan necessary for implementation and thus the size of the digital transformation.
Managing digital change projects

In the following section, individuals’ resistance and readiness for digital transformations and change is first described, including how individuals can have different reactions at different points in time of an implementation process, how to understand behaviors and why reactions to change can be strong. Secondly, the leadership role in digital change projects is presented, where relevant character traits and styles of communicating are highlighted. Lastly, technological- and social aspects of designing a digital change are described as inspired by project- and change management concepts.

2.3.1. Individuals’ resistance and readiness

Implementing new technologies in an organization affects the well-being and performance of the individuals (Kadir & Broberg, 2020), and could impact the skill requirements (Balsmeier & Woerter, 2019). Furthermore, individuals generally favor the status quo and are reluctant to give up their habits, which implies that resistance is a normal human response to changes (McLaren et al., 2022). Thus, it is important to be aware of potential technology-specific resistance and the readiness for digital transformations among individuals, in order to understand challenges of successfully managing digital transformations. Similarly, from a change management perspective, the main focus when it comes to success within change projects is to understand how individuals react to changes (Hallin et al., 2020). Expressing negative reactions to change is called a resistant behavior, whilst positive reactions indicate change readiness (Endrejat et al., 2021). Similarly, resistance and readiness for change can be described in terms of different behavior styles, where resistance relates to a prevention behavior and readiness to a promotion behavior. Petrou et al. (2018) claim that if individuals have a prevention behavior they may feel uncertain or like they have something to lose if the change is successful, and according to Ito et al. (2021) these individuals have a high demand for good communication and concrete information. Meanwhile, individuals who feel like they have something to gain from a successful change have a promotion behavior, which are adopted by individuals who prefer change rather than stability, are open minded for new opportunities by embracing change in their organization, and who easily adapt to changes (Petrou et al., 2018).

On a physiological level, it is common for individuals to react strongly to changes depending on how the changes are affecting their values and meaning with the work they are doing (Petrou et al., 2018). For instance, there are three basic psychological needs that every human requires, which is autonomy (sense of choice), competence (feeling of being effective), and relatedness (meaningful connections) (Endrejat et al., 2021). Saatci and Ovaci (2022) further support the need for feeling competent by stating that readiness relates to the individuals’ perceived self-efficacy (confidence about their own abilities), as it implies the individual is confident in adapting to the changes and has self-motivation to cope with the uncertainty of the change. If a workplace fosters these psychological needs, individuals will be more self-determined and self-driven, which will enhance their performance and wellbeing (Endrejat et al., 2021). However, change tends to affect these psychological needs as e.g., restructuring
may limit autonomy, new software requires other competences, and individuals lose work-related relationships due to down-sizing. Thus, negative effects on these three needs may lead to resistant behavior and addressing these three needs are an important aspect of mastering changes (Endrejat et al., 2021).

Regarding technology-specific resistance, Ito et al. (2021) identifies five specific factors as sources for resistance: 1) feelings of inadequacy, 2) unclear values, 3) work overload, 4) feelings of over-supervision, and 5) concerns about losing a job position or power. These factors relate to Kadir and Broberg's (2020) description of negative impacts on individuals’ well-being (see table 2.3.1.1). For instance, feelings of inadequacy can relate to individuals questioning their skills and competence. However, it is important to note that the well-being of people is affected differently in the before, during and after phases of implementing new technologies, where the most negative impacts on individuals’ tend to occur during an implementation whilst the most positive impacts tend to occur after an implementation (Kadir & Broberg, 2020). The before implementation phase tends to be neither excessively negative nor positive in terms of well-being (Kadir & Broberg, 2020). Thus, it is especially important to address individuals' concerns during an implementation, and Ito et al. (2021) state that the main identified approaches to manage resistance include communication, participation, and training. Other general sources of resistance include whether an individual has a negative experience from a previous change project, and if previous organizational promises have been broken so that there is no trust in the organization or leaders (Jager et al., 2021). Additionally, if the changes are demanding for the people involved, it may foster ambiguity and uncertainty which further causes resistance and mistrust. For instance, if expectations of time and effort are perceived as unrealistic (Lines et al., 2015).

<table>
<thead>
<tr>
<th>Negative impacts on well-being</th>
<th>Before</th>
<th>During implementation</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Worry about having to work at a faster pace&quot;</td>
<td><em>Frustration about information limitations of upcoming changes</em></td>
<td><em>Frustrations regarding lack of standards</em></td>
<td></td>
</tr>
<tr>
<td>&quot;Worry over losing their job&quot;</td>
<td><em>Frustration about any partially developed solutions</em></td>
<td><em>Training material</em></td>
<td></td>
</tr>
<tr>
<td>&quot;Questioning their skills and competence&quot;</td>
<td><em>Reluctance to work with the new technologies</em></td>
<td><em>Management commitment</em></td>
<td></td>
</tr>
<tr>
<td>&quot;Worry over how their health and safety may be affected&quot;</td>
<td><em>Stress about changes in work division or potential red numbers and alarms</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive impacts on well-being</th>
<th>Before</th>
<th>During implementation</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Excitement about working with the new technologies&quot;</td>
<td><em>Like to be involved in the design and implementation process</em></td>
<td><em>Less worry over health and safety</em></td>
<td></td>
</tr>
<tr>
<td>&quot;Look forward to learning new skills and competences&quot;</td>
<td><em>Enjoy learning new skills and working with the digital technologies</em></td>
<td><em>Less worry over risks about losing their jobs</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Like the new ways of working</em></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.3.1.1 - Impacts on individuals’ well-being when implementing new technologies, inspired by Kadir and Broberg (2020). [own construction]
2.3.2. Leadership in digital change projects

An individual's readiness for digital transformation depends on the perceived need for change and perceived organizational benefits (Saatci & Ovaci, 2022). Thus, leadership is one of the key motivators, where communication, supportiveness and clarity about changes are important tasks to address as a leader (Feng et al., 2016; Petrou et al., 2018). Furthermore, lack of support in management is identified as a source of resistance towards changes and digital transformations (Feng et al., 2016; Petrou et al., 2018). Therefore, it is important to identify change leaders to minimize risk of resistance (Lines et al., 2015), as the leadership is essential to create a desire for change (Hallin et al., 2020), and to ensure there is a good collaboration with individuals and communication in order to create organizational trust (Jager et al., 2021).

Trust in management is key to reducing resistance to change (Petrou et al., 2018), as individuals who trust their leaders are more ready for change, and thereby perceive change processes more positively (Matthysen & Harris, 2018). Additionally, trust is an essential factor as people will be operating in uncertain environments and could adopt self-protective and defensive behaviors if they are unwilling to be vulnerable in front of their leaders (Abbu et al., 2022). Thus, characteristics which foster trust are an important aspect of a digital leader, and Abbu et al., (2022) explains that leaders’ need to demonstrate their own commitment to digital change by acting with integrity and intent, and showing the proper capability and results required. Other necessary leadership competencies for a digital transformation are identified as “adaptability, the right attitude, communication skills, data-driven decision-making, empowerment, failing fast, experimentation, open-mindedness, risk-taking, trust, surface-level technical knowledge, and vision.” (Imran et al., 2021, p.468-469). Furthermore, leaders can show two different types of behaviors: task-oriented or people-oriented, and both leadership behaviors should always exist in order to succeed with a digital transformation within an organization (Battilana et al., 2010). The people-oriented leadership creates trust, relationships, and respect for employees towards digital changes. In addition, the leadership also includes organizational behaviors that promote cooperation between employees and support to be digital minded by developing their personal skills (Weber et al., 2022). Meanwhile, task-oriented leadership works towards structuration, design, and direction, where the main focus is on targets and goals (Weber et al., 2022).

Another important aspect of leadership is communication, which is highlighted by Jager et al. (2021) who claims communicating in the right way is essential to succeed with changes. For instance, the daily interactions and communication style between change leaders and their coworkers affect the change readiness of the people, where autonomy-restrictive communication such as coercion, argumentation, and persuasion lead to psychological resistance rather than change (Endrejat et al., 2021). Unfortunately, autonomy-restrictive communication is commonly practiced among leaders when faced with people having negative responses to changes. One explanation for this reaction as explained by Endrejat et al. (2021) is the righting reflex, which means that reasonable arguments for why the change is better than the status quo are given as a reflex to offer understanding for someone resisting
the change. Instead, a sincere communication style is advocated by Aitken and von Treuer (2021), who highlight the necessity of facilitating open discussion by asking effective questions. Furthermore, Endrejat et al. (2021) claims practicing reflective listening or autonomy-supportive communication is preferable. Autonomy-supportive communication refers to providing choices and acknowledging another individual's perspective, whilst reflective listening implies trying to interpret another individual's feelings and repeating it back to the person for verification. This is further supported by Aitken and von Treuer (2021) who states active listening skills are important, including the ability of interpreting non-verbal messages whilst communicating.

2.3.3. Designing a digital change project

It is impossible to allow digital transformation without changing the basis of the organization (Imran et al., 2021). Hence, current researchers such as Hanelt et al. (2021) emphasize the importance of creating new forms of organization structures where digital transformation is in main focus. An ability and flexibility to adapt to digital solutions quickly is essential (Hanelt et al., 2021), in which case having a less hierarchical organization is advocated as it implies less formalization and layers for making decisions (Imran et al., 2021). Additionally, establishing a collaborative and agile organization style can help to integrate the digital transformation (Kane et al., 2017). In addition, working with cross-functional teams helps the organization to leverage knowledge about the digital transformation, make sure that individuals understand and are informed about the industry 4.0 technologies (Machado et al., 2021). Furthermore, it is important to build a high level of willingness and participation in learning about digitalization and the needed changes (Machado et al., 2021). Senior managers should therefore go through the change process with all levels of employees concerning both strategic and functional objectives to ensure everyone accepts being a part of it (Saatci & Ovaci, 2022). Thus, working with a digital change project involves looking over the structure and putting together an appropriate project group, and as highlighted by Imran et al. (2021) it implies working with both technological and social aspects.

From a technological perspective, there exists a multitude of research and models to follow concerning project management. However, regardless of which project management models are used to design a digital change project, it is important to consider digital strategies to increase awareness and knowledge about future technology (Kane et al., 2017). According to Matt et al. (2015) a digital transformation strategy should address four dimensions: use of technology (attitude and ability to exploit new technologies), changes of value creation (impacts technology has on business model), structural changes (how the organizational setup changes due to technology), and financial aspects (pressure on the core business and resources of funding the transformation). Furthermore, when developing a digital strategy, the entire implementation, prioritization, and coordination of the digital transformation needs to be integrated (Hanelt et al., 2021). In addition, the digital strategy needs to be structured in such a way that everyone in the organization can understand it (Lau & Höyng, 2022). Therefore, to make sure that everyone in the organization is aware of the digital changes and plans, it is important to involve all employees in the digital strategy, to educate and work with
learning needs (Schneider & Kokshagina, 2020) - for instance by highlighting the purpose and reason of why the new technology is important (Hanelt et al., 2021).

A traditional method of project management is the stage-gate model, where projects are divided into milestones upon which certain criteria has to be met, and every milestone implies a point at which a decision has to be made whether or not to move forward to the next stage (Hallin & Gustavsson, 2015). However, the stage-gate model's utility in dealing with implementing process innovations in the fast pace of technological changes is questionable and for projects concerning digital changes agile implementation processes are advocated (Sjödin et al., 2018: Imran et al., 2021). Agile implementation processes provide autonomy and flexibility, and builds upon sprints, short development cycles, daily meetings, and minimum viable solutions in order to continuously evaluate and improve production processes when faced with changing demands (Sjödin et al., 2018).

From a social perspective, there are many models to follow for change management, where one of the most well-practiced is ADKAR’s five step model. The ADKAR five step model focuses on how an individual experiences a change and is applied after a change has been identified (Gallis, 2018). The first step Awareness involves informing the individual of the need for the change, whilst the second step Desire involves motivating and supporting the individual to participate and to want the change (Hiatt, 2006). The third step Knowledge is required for the individual to know how to change, whilst the fourth step Ability refers to acquiring the skills and behavior necessary to implement the change. The last step Reinforcement is about what is needed to maintain and sustain the change. The ADKAR model according to Gallis (2018) is suitable for smaller projects and teams.

It is important to be aware that there exists certain critics against some change management models, despite them being well practiced. For instance, Machado et al. (2021) who question how valid some models really are due to the lack of scientific background for the creation of the models. Furthermore, McLaren et al. (2022) mean that the avoidance motivation approach applied in some models could contribute to more resistance against changes from the people affected, as this method implies stressing people to feel the need to change by highlighting the dangers of keeping the same status quo. Thus, this method is potentially increasing anxiety, uncertainty, fear, and stress, all of which according to Weber et al. (2022) are factors causing resistance. McLaren et al. (2022) instead promotes using approach motivation methods, where the possibilities of the future are highlighted to motivate people to desire/want the change. Additionally, the elements in the current status quo which will remain the same after changes have been made should be highlighted to generate an approach motivation.

2.4. Visualization of the theoretical framework concepts

The analyzation model (see figure 2.4.1) showcases the connections between the different concepts studied in the literature review which is highlighted in the theoretical framework. It is presented here as a visualization of how to interpret the theoretical framework. Working with a digital change project involves implementing a digital transformation and working
with change management, which implies that both concepts should be addressed when managing the digital change. Furthermore, managing a digital change involves being aware of individuals resistance and readiness, where it is important to understand technology-specific resistance factors and different behaviors and reactions. Managing a digital change also involves understanding leadership, including different characteristic traits and communication styles adopted by leaders. Additionally, it is necessary to learn how to design a digital change project, which involves utilizing change management models and working with project management.

![Diagram showing the relationship between digital change project, digital transformation, change management, individual resistance and readiness, leadership, and design a digital change](image)

*Figure 2.4.1. - Analyzation model. [own construction]*)
3. Method

The following section describes the chosen approach of this study. Initially the research strategy is presented, followed by a discussion regarding the chosen industry in focus, and a description on how the literature and empirical data was gathered. Lastly, the reliability, validity and ethics of the study is discussed.

3.1. Research strategy

This study aimed to answer the research question *How can organizations work with change management within a digital transformation project to facilitate a change?*. The topic was chosen due to the necessity of learning how to manage successful changes related to digital transformations considering the 66 to 84% failure rate it entails (Correani et al., 2020), in relation to social aspects being identified as one cause for digital transformation failures (Imran et al., 2021). A **qualitative approach** was chosen for this study, as it is used to gain a deeper understanding for a chosen phenomenon and the reality of it (Bryman & Bell, 2014; Blomkvist & Hallin, 2015). This was considered appropriate for the study as it aimed to gain a deeper understanding of how organizations can manage a digital change project and thereby, insights and perspectives from people involved in digital change projects was relevant.

A **quantitative approach** was not deemed appropriate for this study due to its unsuitability for gathering deeper and nuanced insights and perspectives on the phenomenon. Quantitative methods are used to analyze relations between different variables (Ejlertsson, 2014), where data is collected in quantity, and is structured and analyzed in order to generalize statistics from different sample groups (Blomkvist & Hallin, 2015). Furthermore, to reach a large number of respondents, quantitative approaches often involve methods using surveys where questionnaires are required (Blomkvist & Hallin, 2015). However, building questionnaires on open-ended questions, in order to gather the perspectives of the respondents, implies a higher risk of respondents misinterpreting or skipping questions (Eliasson, 2018). Thus, a quantitative method would not leave room for clarifications or deeper insights of the phenomenon. Furthermore, the study followed a **deductive approach**, where scientific articles were initially reviewed and continuously compared to one another (Glaser, 1998), which gave a first understanding of the phenomenon and an idea of what to study in a practical setting to formulate valid conclusions. Multiple sources indicating similar conclusions implies the conclusion can be generalized, and by collecting and comparing research and academic texts as described above, the reliability of the study could thereby be reinforced (Bryman & Bell, 2014).

3.2. Case study

The qualitative method chosen for this study was a case study, where a case company was selected to observe the chosen topic in a practical context (Blomkvist & Hallin, 2015). A case
study is appropriate when the purpose is to describe, investigate and explain a phenomenon to get a broader perspective of the complexities and circumstances surrounding the chosen topic (Yin, 2007). Regarding choice of industry to study, it was noted that the demand for digital solutions has been increasing and that the automotive industry is changing fundamentally, when it comes to product(s) and process(es) and to stay competitive on the market (Bossen & Ingemansson, 2016). Additionally, the automotive industry has a great impact on innovation when it comes to digital transformation and changes within their supply chain (Bossen & Ingemansson, 2016), and is an interesting area for science- and development intensity. Thus, the automotive industry is an appropriate choice for this study of digital transformations and changes. Regarding the choice of case company, a manufacturing company in the automotive industry was chosen, due to being one of the global leading companies within the automotive industry in Sweden, and because the company has been undergoing some major digital transformations the last few years.

One digital transformation project that the case company has recently been working with, and which this study focuses on, is the establishment of a new production set-up for a previously outsourced component now built on advanced techniques in-house. The project, henceforth called Project X, was initiated in response to problems with a supplier and the desire to reduce manufacturing costs for a specific product. However, bringing in the new production line involved challenges of a limited space to set up the new line, and a limited time. Thereby, Project X involved; 1) a new production set-up with new processing machines and automation that the case company had no previous knowledge of, 2) a new production concept with functional cells instead of a traditional continuous line, 3) Automated Guided Vehicles (AGVs) transporting material from one cell to the other instead of utilizing conveyors, and 4) operators mainly started to work proactively by monitoring the machines from a control center instead of operating reactively and manually by the machines. In writing time there is a division in opinion as to whether Project X is fully finished or still ongoing, where some respondents talk as if it is completed whilst others (mainly operators) see it as under progress. Not every desired outcome has been reached within Project X in that there are more operators than planned and lots of residual points left to fix, yet it still reduced costs and initiated an organizational-wide digital transformation at the case company where Project X has acted as a pilot project inspiring other projects. Meaning, whilst there is room for improvements, the project is still considered a successful project within the chosen case company, which involved many changes, and is appropriate for this study.

3.3. Literature review

One of the first activities of the study was a literature study, which created the basis of the theoretical framework. To study change management within digital transformations and answer the research question of the study, several topics were relevant to gain an understanding for the area of interest: change management, digital transformations, Industry 4.0, industrialization, resistance, readiness, and change initiatives. During the literature study the connections between these subjects and the research question were continuously questioned, and an overview of how to work with change management within digital
transformation projects was presented under section 2.3. Literature was gathered using search tools such as Mälardalen University (MDU) library, Google Scholar or ScienceDirect. Search terms included change management AND digitalization, change management AND digital transformation, change management AND Industry 4.0, resistance AND technology, etc. Furthermore, additional relevant articles were found using (backward) snowballing techniques, where articles within the subject area are generated by analyzing the references of selected articles. Additionally, books from the MDU library, and a limited number of conference and public agency issued reports were used.

3.4. Interviews

Empirical data was collected using semi-structured interviews, which is a qualitative method. It was a method chosen due to its suitability to paint a clearer picture of the respondents in how they perceived their reality and environment. Additionally, interviews were considered an appropriate method as the case study required a sufficient amount of descriptive data on the digital change project studied in order to answer the research question. Semi-structured interviews implies that questions are prepared before an interview, though there is room for reformulating and adding questions during the interview based on the respondents' responses and the necessity of gaining further clarity (Bryman & Bell, 2014). Thus, the interviews tend to be flexible as the respondents are allowed to interpret questions in their own way, and patterns in their behavior and perspectives can be analyzed. The respondents’ interpretations of the questions depend on the formulation of the questions. To ensure relevant information was collected, it was thereby important to work on the formulation of the questions and for this study, a theoretical sampling (non-random sample) was chosen as a selection method for limiting the data focus. A theoretical sampling implies data is acquired and sorted before interviews and is used to guide what data is gathered during the interviews (Bryman & Bell, 2014). Thus, the theoretical framework should influence the question formulation, which for this study was incorporated by operationalizing the theoretical framework.

Operationalization involves identifying the frequently used terms of the theoretical framework, then translating and structuring them into interview questions so that all literature can be touched upon during the interview (Blomkvist & Hallin, 2015). The interview questions were furthermore compiled into an interview guide (see appendix 1) where all questions were connected to the theoretical framework in such a way that questions relating to a specific theoretical theme were grouped together. Although, the questions were not proposed in the same order as in the interview guide, rather were varied depending on the natural flow of the conversation. Furthermore, to truly gather an appropriate picture of the reality, insights and perspectives of the phenomenon in practice were considered relevant. Thereby open-ended questions were required, and the questions were formulated to be open-ended by adopting initial words such as how, which, whom and what. Open-ended questions further create opportunities for developing supplementary questions (Bryman & Bell, 2014).

Regarding the choice of respondents for the interviews, a purposive selection method was used to limit and choose an appropriate non-random sampling - which implies that
respondents are handpicked. This was an appropriate selection method for this study due to the choice of respondents affecting the quality of the empirical data collection (Denscombe, 2014), where it was considered beneficial to interview people who have a certain knowledge and experience within the organization. Thus, the respondents were handpicked from several different professional roles to ensure different relevant perspectives on the digital change project could be acquired. Leadership roles were relevant to get a broader perspective on the digital change project, where different project- and change leaders were interviewed to get a better understanding for the management of the digital change project. Additionally, operators were included in the sampling as an umbrella term for non-leadership roles which may be directly (practically) involved in the digital change project and were included due to the different perspectives on change and behavior the operators could bring. In other words, respondents were handpicked to ensure different perspectives could be collected and analyzed based on positions within the organization and the relation to the studied change project.

A form of snowballing selection was further conducted when handpicking relevant respondents, which Eliasson (2018) describes involves selecting new respondents by asking a respondent during an interview if they know of additional relevant people to interview. This form of selection was followed in that change-, project and team leaders were asked for potential other respondents to interview, and was deemed the most efficient way of selecting relevant respondents as the leaders have an insight as to how involved different individuals were in Project X. The first person interviewed was a digitalization consultant (DC) at the case company who first were thought to have been involved in the project, yet during the interview it was made clear he/she only knew about Project X in his/her work of conducting a pre-study for an upcoming project at the case company inspired by Project X. However, DC worked close to the project leader (PL) of Project X who was the second person interviewed. PL thereafter referred to two team members: a logistics- & IT responsible (LIT), and a production technician (PT). Third interview was with two change leaders (CL1, CL2) involved in a pre-study of an upcoming project similar to DC. The change leaders furthermore referred to two managers of interest for the project: the department manager (DM) responsible for the operators of Project X, and the product manager (PM) responsible for the component in focus for Project X. DM then referred to one operator (OP1) and a team leader (OPTL). To gather more input from operators, OPTL referred to two operators within Project X (OP2, OP3). Additionally, OPTL referred to one operator working on a production line next to Project X who has heard some negative aspects of the project (partly from sharing a break room with the operators of Project X) and gave a different perspective compared to the people directly involved (OP4).

The respondents were contacted by email or phone to schedule meetings. There were 13 interviews conducted (see table 3.4.1), where three interviews were conducted in person at the case company whilst the rest were conducted digitally on Microsoft Teams with camera on to create a more natural conversation. Everyone except the change leaders were interviewed individually to ensure respondents would not affect each other's views. The change leaders were interviewed in a group due to them working together daily. Additionally,
interviewing the change leaders in a group helps to get a deeper understanding and information on the specific focus area, and potentially gather new insights (Blomkvist & Hallin, 2015). During the interviews one of the authors took lead on the interview following the interview guide, whilst the other proposed supplementary questions and took lead on taking notes. Upon approval of the respondents, the interviews were recorded and transcribed. Thereafter data collected in the interviews was analyzed using a thematic analysis technique (Guest et al., 2012), where data was first compiled in an excel document to create a better overview and then categorized according to theoretical themes so that connections between the empirical and theoretical material could be identified. All the respondents have been processed anonymously, where only their respective professional role is noted (see table 3.4.1).

<table>
<thead>
<tr>
<th>Designation</th>
<th>Professional role</th>
<th>Interview time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>Digitalization consultant</td>
<td>58 min. 2023-02-28</td>
</tr>
<tr>
<td>PL</td>
<td>Project leader</td>
<td>53 min. 2023-03-01</td>
</tr>
<tr>
<td>CL1, CL2</td>
<td>Change leaders’</td>
<td>80 min. 2023-03-02</td>
</tr>
<tr>
<td>LIT</td>
<td>Logistics &amp; IT responsible</td>
<td>47 min. 2023-03-06</td>
</tr>
<tr>
<td>DM</td>
<td>Department Manager (1st interview)</td>
<td>52 min. 2023-03-08</td>
</tr>
<tr>
<td>PT</td>
<td>Production technician</td>
<td>58 min. 2023-03-08</td>
</tr>
<tr>
<td>PM</td>
<td>Product manager</td>
<td>42 min. 2023-03-09</td>
</tr>
<tr>
<td>DM</td>
<td>Department Manager (2nd interview)</td>
<td>72 min. 2023-03-15</td>
</tr>
<tr>
<td>OP1</td>
<td>Operator</td>
<td>39 min. 2023-03-16</td>
</tr>
<tr>
<td>OPTL</td>
<td>Operator and team leader</td>
<td>77 min. 2023-03-16</td>
</tr>
<tr>
<td>OP2</td>
<td>Operator</td>
<td>33 min. 2023-03-20*</td>
</tr>
<tr>
<td>OP3</td>
<td>Operator</td>
<td>31 min. 2023-03-20*</td>
</tr>
<tr>
<td>OP4</td>
<td>Operator</td>
<td>32 min. 2023-03-20*</td>
</tr>
</tbody>
</table>

Table 3.4.1. - Overview of respondents, their position within the case company and the time of the interview. Dates marked with * indicate the interview was conducted in person at the case company. [own construction]

### 3.5. Method discussion

To assess the quality of the study, the validity and reliability is important to address, where “validity entails studying the right thing while reliability entails studying in the right way”
Reliability is also one of the aspects used to analyze the credibility of a study, together with transferability, trustworthiness, and confirmation (Bryman & Bell, 2014). Transferability refers to how the results can apply to other situations outside the study, whilst trustworthiness is about the credibility of the results in the study. Confirmation corresponds to objectivity, where collected data is checked as to whether the authors’ own values affect the conclusions of the work (Bryman & Bell, 2014). In this study, the authors tried to counteract this by being objective and remark changes after receiving feedback. Feedback from both supervisors and opponents were received at multiple occasions, which further increased the objectivity and reliability of the study. Additionally, in the presentation of empirical findings the respondents’ own words were used as much as possible to ensure the authors’ own words were not affecting the text.

The reliability of the study could be analyzed when reflecting upon the collected data and literature. Concerning the literature review, the reliability was increased as theoretical articles were continuously compared to one another, so that when multiple sources indicated the same conclusions, the credibility of the sources was strengthened. Thereby, the conclusions of the sources could be accepted as a credible description of the studied concepts. Additionally, the validity and reliability of the literature sources was increased as the articles used were peer-reviewed, was found using appropriate search tools as explained in section 3.3 and concerned areas relevant to the research question. To increase the reliability of the data collected through interviews, efforts to minimize vague statements and misleading words were taken, to make sure that the questions were rational (Hanssons, 2007). However, the reliability of the collected data may also have been affected by the choice of analyzation method, as a thematic analysis builds upon interpretations (Guest et al., 2012).

The transferability of the study was limited to the choice of method for collecting empirical data. Whilst the validity of the information acquired through interviews was credible, as it gave a clear picture from the respondents’ perspectives respectively, the context as to where the results may apply is limited. Only one project at one case company was studied, which limits the transferability of the empirical findings to other situations where different conditions apply. Thus, results of this study may only apply to similar cases. This is in line with the limitations for case studies in general, where transferability is limited due to differences of cases studied (Blomqvist & Hallin, 2015). However, as the aim was to study how an organization can work with change management within a digital transformation project, there may be similarities in conditions for projects for which (part of) the results may apply.

The trustworthiness of the results was increased similarly to how the reliability of the sources was increased; empirical data and the literature reviewed were continuously compared to find similarities or differences in conclusions. However, the respondents’ attitude toward the interviews may also have affected the trustworthiness of the results in the study. The qualitative approach and interview method applied involved risks of respondents not answering honestly, misinterpretations, or unwillingness to give certain sensitive information or personal opinions (Bryman & Bell, 2014). To counteract these identified risks, the questions were formulated to be open- and non-leading, and supplementary questions were...
important to include to ensure the given answers correspond to how the respondents perceive their reality. Furthermore, the respondents were processed anonymously to ensure they were comfortable in case knowledge of their name created difficulties to give honest answers.

3.6. Ethical consideration

The study followed ethical requirements by addressing Vetenskapsrådets (u.â.) four principles of ethics: 1) information, 2) consent 3) confidentiality, and 4) utilization. The first principle information requirements were addressed when doing the interviews, where the respondents were informed of the purpose of the research and why they were selected for the study (see Appendix 1). Additionally, the respondents were informed that their participation was confidential and anonymous, and that there were no correct answers so long as their responses reflected their own perspective on the digital change project. The second principle, the consent requirements, refer to respondents’ approval to be studied, and was handled at the beginning of the interviews where the respondents were asked if they approved to be studied and if recordings were acceptable during the interview.

The third principle, confidentiality requirements, refers to keeping personal details from the respondents (e.g., names) confidential. The authors ensure that the study would not reveal personal information that could enable outsiders to identify who has been interviewed, by omitting names (including company) from the study. Lastly, the fourth principle, the utilization requirement ties all principles together, and involves informing the respondents that answers and collection of data will only be used for the specific study (Vetenskapsrådet, u.â.). This was conveyed to the respondents when conducting the interviews. Furthermore, the authors made clear to the company supervisors that the study was a public essay, and an agreement was made which stated that all collected data needed to be checked before the study was published, to avoid mistakes of leaking sensitive information.
4. Managing a digital change project at case company

In this section information regarding Project X is first presented: where the project came from, and what technical and social changes it implied. Thereafter, the perceived attitudes among the people involved or affected by the project is described, followed by a description of the leaders. Lastly, the approach of working with Project X is presented. All information aims at describing the conditions of the digital change project in focus for this study, and the approach taken to managing its successful change.

4.1. Description of Project X and the changes it implied

The project originated from a necessity of producing a component in-house as the supplier of the component was going to stop their production (PL, CL2, PM, OPTL). Additionally, it was a financially strategic decision as producing the component in-house was estimated to reduce costs (PM), and reduce the number of staff (OP4, DM, PM, OPTL). Limitations for the project scope included a short time frame to produce the component at necessary capacity (DC, PL, CL2, PT), and a shortage of space for the production (PL, CL2, PT, PM). According to PL Project X needed to deliver components within 1.5 years. Furthermore, there was an awareness of the necessity of having a flexible production line in the future (PT, PM, PL), and a desire to apply new technology and automation (DC, PM, OP1, OP4). Thus, a new production concept was adopted with a functional cell layout where there are multiple machines capable of doing the same operations (PM). In other words, each machine can do multiple different steps of the processing, in opposition to the machines of a traditional line where each machine would conduct different steps (PT, PM). Thus, the new production line involved a new way of processing components and introducing new digital technology (DM). The result of the complexity of the machines is that it may take longer for operators to learn and understand a machine, yet once they do, they can work with each machine. Other examples of automation initiatives are operational follow-ups (CL1), and an order management system (PT).

The movement of material between machines has been automated using AGVs (CL2, DM, PT, PM, OP4), which are flexible and move around obstacles (DM) and choose the smartest path when delivering materials between machines (PM). Additionally, a collaborative arm is attached to the AGV, creating a so-called cobot capable of picking and moving components (PT), load the machines (PM), and take measurements of the components (PT). However, this cobot did not exist on the market and had to be developed within Project X (PT). Initially the project was thereby met with resistance in finding suppliers to help them with the development, yet by looking among both new and traditional suppliers (PT) and taking the risks and costs of developing the project (PL), a cobot could eventually be developed. The new transportation has impacted how the operators have to work around them (OP1). For instance, OP4 highlights how disturbances have been caused by people leaving obstacles in the path of the AGVs where no other route is possible. OP4 also explains that the AGVs lack of priority list makes it hard to discover from where an error may have occurred once a defect is found. Furthermore, OPTL highlights that the new production line has led to quality.
defects taking longer to detect as the operators have less physical contact with the components.

The project also changed the ways of working. For instance, operators work more with process monitoring and developments (DM, PL, DC), where they are utilizing monitoring screens to watch for disturbances (DM, PM), and certain tasks such as operator maintenance are built into the machines instead of following a manual schedule (CL1). This way of working is more proactive (PL), and ergonomic as it reduces workload (PT, OP3, OP4). According to PM, everyone (operators, technicians, and maintenance) had to learn new skills. At the same time, several respondents claim the project did not majorly change their personal way of working (DC, PL, PM, OP1, OP3, OP4), except for needing more knowledge about technology (OP2, OPTL) and for CL2 and PT it meant additional tasks to guide visitors around the new production flow.

Concerning the people involved in Project X, there are two distinctions made: the project team of 5-6 team members (PL, LIT), and the operators on the production line today consisting of up to 10 operators (DM). Compared to the number of operators the initial supplier estimated was necessary for the production line of the component in focus of Project X, the case company has achieved a lower number of operators (PL, CL2, PT). However, there are more operators than initially planned for Project X, as they have gone from three to eight operators (OPTL), and instead of having one operator per shift there are two (OP4). According to OPTL, DM and OP4 it is not possible to be fewer as there is a lot of running between machines due to disturbances. This is further strengthened by DM who based on own calculations considered an unmanned night shift as unachievable and thereby had to argue to the management why more operators were needed. Regarding organizational structure at the case company in general, the project has not changed the hierarchical build (PT, LIT, CL1), though according to CL1 the IT organization has begun to create their own sub-organization. Additionally, LIT means that IT has a bigger role within projects than before, and CL2 highlights that today the maintenance department has had to broaden their competences by hiring simulation engineers and data analytics to manage system related problems. Thus, Project X has impacted the organizational structure in some way.

4.2. Perceptions of resistance and readiness

To understand how people were affected by the changes of Project X, the perceived resistance and readiness within the project is presented. Reactions and attitudes as described by the respondents are highlighted in tables 4.2.1-4.2.4. To understand all the respondents’ first reaction and thoughts of Project X, their first impressions are highlighted in table 4.2.1. Overall, the first impressions are mostly positive. The main initial concerns raised include DM being reserved about some of the goals, OPTL skeptical and concerned about having enough energy to learn everything that was needed and PT believing it was just a dream.
Table 4.2.1.- Respondents first impressions on Project X. [own construction]

Beyond the initial reactions to Project X, the respondents' own general attitude towards change is presented in table 4.2.2 for a broader description of the respondents’ behavior when it comes to changes. In general, all respondents express a positive attitude towards changes (see table 4.2.2).

Table 4.2.2.- Perceived attitudes towards changes and routines in general. [own construction]
To gather a bigger picture of how people reacted to Project X beyond the respondents’ personally, the respondents’ perceptions of other peoples’ attitudes towards the project are highlighted (see table 4.2.3-4.2.4). Table 4.2.3 describes positive reactions (perceived readiness) towards the change, which is followed by negative reactions (perceived resistance) in table 4.2.4. Differences in attitude with different time spans such as before, during and after the implementation of a new production concept within Project X is presented. Overall, the perceived attitude towards Project X was rather skeptical or non-believing where people did not want to be involved in the beginning and during the implementation phase (DM, LIT, PT). However, respondents such as PL, CL1, LIT and DM have perceived a very positive attitude towards Project X after the implementation.

<table>
<thead>
<tr>
<th>Perceived Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
</tr>
<tr>
<td>During: Some unexpected individuals really blossomed: “It was an operator who took big initiatives himself [...] show sides that they couldn’t actually show under normal conditions with an ongoing production” [own translation]</td>
</tr>
<tr>
<td>After: “Individuals got a new ignition of the new ways of working: 1) more creativity, more analytical skills, 2) better ergonomics, 3) work more closely”</td>
</tr>
<tr>
<td>PL</td>
</tr>
<tr>
<td>During: Lucky with support from top management: “Top management [...] kind of embraced us because they understood what we were doing and they brought in very competent staff from the side [...] because they really wanted us to succeed with this because now this is the pilot for the whole [organization]” [own translation]</td>
</tr>
<tr>
<td>After: in response to perceived attitude PL states: “And then now after [...] everyone is very proud and everyone wants to work there” [own translation]</td>
</tr>
<tr>
<td>CL1</td>
</tr>
<tr>
<td>During: Success story regarding operators stepping up and programming, and regarding ergonomics: “there was some other operator [...] who had some problems with their back and so on, and so they tried an initiative to try to run this and it was a success story” [own translation]</td>
</tr>
<tr>
<td>After: Believe that the management team has changed their attitude after project X, that they dare more.</td>
</tr>
<tr>
<td>CL2</td>
</tr>
<tr>
<td>During: Success story regarding operators stepping up and programming.</td>
</tr>
<tr>
<td>After: Regarding perceived attitude: Some people who afterwards went to be involved in the process who earlier distanced themselves.</td>
</tr>
<tr>
<td>DM</td>
</tr>
<tr>
<td>During: “Production unprepared as they had to learn about the technology after implementation of solutions: “ [...] we have always received the information but that information has come when we have implemented new solutions.” [own translation]</td>
</tr>
<tr>
<td><em>Operator success story.</em></td>
</tr>
<tr>
<td>After: “There was a change of attitude in that “There was concern/doubt that the technology would really work, but we have proven it, as it works quite well” [own translation]</td>
</tr>
<tr>
<td>PT</td>
</tr>
<tr>
<td>General: “I don’t think there was anyone who opposed this digitalization journey. [...] I think everyone is aware that it’s needed” [own translation]</td>
</tr>
<tr>
<td>Before/During: There has been a change in attitude in that “In the beginning there were very many who didn’t believe in this, then when we began to start it up it became very positive” [own translation]</td>
</tr>
<tr>
<td>PM</td>
</tr>
<tr>
<td>During: New young operators are ready: “[...] there are a lot of young people out there and they are hungry to, they have a great interest in technology and are interested in new things so there has never been any problems for them to pick up on this” [own translation]</td>
</tr>
<tr>
<td>OP1, OPTL, OP2, OP3</td>
</tr>
<tr>
<td>x</td>
</tr>
<tr>
<td>OP4</td>
</tr>
<tr>
<td>After: “Personally positive towards the technology in itself and finds it interesting. OP4 is positive towards going in and working with this type of work only if the disturbances are fixed so that everything works as intended. OP4 is not against introducing digital stuff at OP4’s workplace, thinks it can be good with changes, that it is moving forward”</td>
</tr>
</tbody>
</table>

Table 4.2.3.- The perceived readiness towards the change of Project X (before, during and after implementation) among their peers or within the organization. Rows marked with an “x” indicate no answer was given in regard to the theme [own construction].
Table 4.2.4. - The perceived resistance towards the change of Project X. [own construction]

<table>
<thead>
<tr>
<th>DC</th>
<th>After: Strict rules on maintenance documents means there is negative talk about the transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before:</td>
<td>In response to percieve attitude PL states: &quot;Before they were very skeptical, no one dared to talk about it. [own translation]&quot;</td>
</tr>
<tr>
<td></td>
<td>*The management was against the project: &quot;I... there was extreme opposition to it and no one believed in us, not even the management. So it was probably more the top management that really supported us, because locally, they didn't Everyone was terrified that we would fail and no one dared to have a backbone. [own translation]&quot;</td>
</tr>
<tr>
<td></td>
<td>*On the biggest factors of resistance: &quot;It was a mistrust - that it will never work [own translation]&quot;</td>
</tr>
</tbody>
</table>

| PL          | During: Ignorance: "there is a lot of ignorance around digitalization. I would say, that it is much more difficult than it is. For example, this thing about connecting the machines, they thought it would take years. [...] It took 5 minutes less - chuff. [own translation]"
|             | *Management do not understand: "[...] they had no clue what they were asking about and how they should... so their risk minimization became more of a strain [own translation]." |
|             | *Regarding roles, PL believes it is the middle manager who must change mindset: "I would probably say that it was the middle managers who were most resistant [...] who must understand that there is a whole new way of working [own translation]." |

| CL1         | During: Stress about technology: "I think it was people on the operator side who felt stress and anxiety about digitalization and the technical solutions. [own translation]"
|             | After: Believes the project group has been disappointed over not being allowed to implement a new standard for operator maintenance within the organization. |

| CL2         | During: Consider that is was more resistance from the operators within other machine groups [departments within the company] |
|             | Before: *At the presentation of the project, there was a negative attitude already from the start: "people just said 'good luck with that' [own translation]." |
|             | *Some people did not want to be involved, if things go badly. |
|             | After: Overestimated time: think people got nervous that the transformation would take a lot of time and overestimate it. |

| LIT         | *Thinks there are more resistance outside of Project X. |

| DM          | *Believes that the older people may think that the new technology is difficult. |

| PT          | During: Describe it as if some people has had it stressful with tools and AGV's causing disturbance |
| PM          | x |

| OP1         | During: *Some find automation to be too much difficult to learn. *Older, outside, have a negative view. *Projects within projects is a bit hard, a lot of new things upon new things. Far from goal and a big implementation. |

| OPT         | During: *Older people find it a bit difficult because they have not grown up with new technology like the younger ones. *Residual points create negative discussions that affect the conditions for future projects. *Project not anchored in reality, too focused on output and results which has caused frustrations: "[...] then an operator has run himself to death for 8 hours and produced a good sum anyway but still the questions is 'yes, why isn't it more?' for example and it's not a good set up [own translation]"

| OP2         | Before: Before starting on Project X OP3 had heard a lot of negative things about how it messed up and stopped, that there was a lot to do, e.g. AGV's was not working as they should. |

| OP3         | During: *Considers that the reality does not correspond to the planning. Lots of unplanned disturbances. *Unrealistic expectations causes stress. Thinks it's better to wait a couple of years until everything works before you want to work with it. |

| OP4         | *Wants better support from management when it comes to disturbances and residual points. |

For a deeper insight into potential resistance and readiness reactions, previous change experiences are highlighted. Regarding previous experiences (PL, 2023) claims to have worked with change projects for 30 years, from where a lesson learned is that “usually I would say that it is middle managers that slow down the most, as they lose their word in the room, or that you go into something new that you are not really in your comfort zone with [own translation]”. In terms of earlier experiences within digital transformation projects, DM highlights a major project within the case company where the factory refurnished (changed layout, optimized logistics and lead times). DM describes it as a frustrating project due to there being a short time frame, ambitious targets, many new working methods, and a lot of...
individual duties. According to the DM (2023) “[…] that period I did not feel good at work […] I think I had 80 separate points to manage [own translation]”. Furthermore, OP4 explains that the case company usually moves too fast with new projects and leaves the unfinished work to the operators. This was also the case for Project X, as OPTL, OP1, OP3 and OP4 means there were a lot of residual points not addressed before moving on to new projects. For instance, OP1 thinks the automation of in- and outflow of materials to the production line of Project X should have been tested on another more reliable line first as there already were a lot of residual points to fix and the automation caused even more disturbances. Hence, according to OP4 he/she thinks most errors need to be solved before he/she would be willing to work with the new lines such as Project X. Another lesson as perceived by OPTL is that planned projects generally rarely mirror reality, they are driven by visionaries, yet the operators are struggling to make it work.

4.3. Leadership in the project

The leadership of Project X has been highlighted by the respondents as important, e.g. by PT who claim the project would not have succeeded without their PL “without him I don’t think we would have succeeded, because it was so much new that I don’t think the rest of us would have really dared to take the step [own translation]” (PT, 2023). Additionally, PM believed the project would succeed due to the PL being a visionary and painting a good picture when initially presenting the idea of the project (see table 4.2.1). Thus, a description of themselves as a leader (PL-PT) is presented in table 4.3.1, describing how they are working and their own perceived traits. Additionally, OP1, OPTL, OP2, OP3, OP4 describe their current leader in table 4.3.1. These descriptions can be used to answer what leadership traits are highlighted as important to succeed with digital change projects from a practical context.
Table 4.3.1.- Description of each respondent's own view of themselves as a leader or of their current leader. [own construction]

To involve individuals towards digital changes such as Project X, the communication style of each individual and leader is important to understand. Hence, in table 4.3.2 each respondent highlights how they as leaders themselves (DC-PM) would respond to any concerns people may approach them with, or how they (OP1-OP4) perceive their leaders respond. DC, PL, DM means it is important to ask questions to see where the concerns originate from, and all the operators perceive their leaders as approachable and that it is possible to raise concerns with them (OP1-OP4).
Table 4.3.2: Respondents’ on how they respond to concerns raised from others. [own construction]

<table>
<thead>
<tr>
<th>Leadership communication style</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC <em>If concerns arise in the project group it is good to &quot;go to the bottom of what the concern depend on [...] [own translation]&quot;</em>  <em>Important to clarify taks: &quot;There shouldn't be a huge amount of room for different interpretations [own translation]&quot;</em></td>
</tr>
<tr>
<td>PL <em>Break down concerns into components: &quot;[...] see what is true [own translation]&quot;</em>  <em>Important to be honest and responsive</em>  <em>Works with consensus</em></td>
</tr>
<tr>
<td>CL1 <em>X</em></td>
</tr>
<tr>
<td>CL2 <em>Listen, give space to vent concerns</em>  <em>Help clarify questions (answer or seek help from others)</em>  <em>Transparency: open and honest about what is happening. Not aloof and secretive</em></td>
</tr>
<tr>
<td>LIT <em>If you know what the change implies, make the individual understand why the change is important: &quot;I think that often it is easy to only see your own small part and how you are affected by a change and not see the whole perspective [own translation]&quot;</em></td>
</tr>
<tr>
<td>DM <em>Ask questions. see where the doubt originates from; &quot;often it is questions of details [own translation]&quot;</em>  <em>Identify triggers, often it is concerns about competence. Minimize concerns by talking</em></td>
</tr>
<tr>
<td>PT <em>I would just answer that, a little harshly, that if we don't do this trip now we will not be here anymore [own translation]</em></td>
</tr>
<tr>
<td>PM <em>Important with information: [...] that you explain 'why' you should change something not only that you should change something [own translation]</em></td>
</tr>
<tr>
<td>OP1 If OP1 feels concern: thinks you can hold a conversation about it (doubts/problems)</td>
</tr>
<tr>
<td>OPTL <em>OPTL thinks he/she has a good boss to vent to if problems arise</em>  <em>Believes that you know what everyone thinks and it is never difficult to discuss</em></td>
</tr>
<tr>
<td>OP2 <em>If OP2 would feel concerned he/she think the leaders would have listened, acted and explained misunderstandings</em></td>
</tr>
<tr>
<td>OP3 <em>Believes that leaders have always embraced problems and worked to solve them, never react negatively, even to negative points of views</em></td>
</tr>
<tr>
<td>OP4 <em>X</em></td>
</tr>
</tbody>
</table>

4.4. Design and approach of Project X

To understand how Project X was managed and thereby how to successfully manage a digital change, the approach of the project is presented in terms of: 1) whether there was a digital strategy, 2) how the team was organized, 3) the scope, planning and models for the project, and 4) how information and education was arranged.

4.4.1. Project strategy

Regarding strategy for Project X there are four main points highlighted by the respondents, namely:

- Lights out: No operators on the production flow at nights, full automation. During days, a limit of one operator per shift. (PL, DM, PT, PM, OPTL, OP4)
- Flexibility: Possibility of producing different item variations in each machine, with a smaller change over time. Necessary for future product customizations. (PL, PM)
- Reducing costs: Producing the component at a lower cost than the previous purchase price was for the component when it was outsourced. Achievable by running the production flow with fewer operators. (DM, OPTL)
● New technology: Adopting new technology (e.g., collaborative robots, edge clients, AGV’s, etc) and leading the digitalization towards a new industrial paradigm. (PL, OP1, OP4)

LIT does not describe the strategy from any of the four mentioned points but concludes that it simply overall was to not fail “we couldn’t fail so the strategy was to make something work and as good as possible [own translation]” (LIT, 2023). CL2 perceives that there was no digital strategy during the project but that it has created strategies for future projects. OP3, OP2, and CL1 do not know of a Project X strategy either. Furthermore, OPTL is not sure why the concept of AGVs was necessary until after it was implemented when it was made clear the new technology made the case company relevant within the industry. Meanwhile, OP3 did not know why Project X was necessary at all.

4.4.2. Project structure and establishing a team

In the beginning of Project X, the project group was initially predetermined and consisted of about 4-6 core team members (PL, LIT). The project group was combined with people from different departments and specialist areas (LIT), and if a certain competence was requested more resources were added (PL). Thus, the project group did not have any specific roles within the project, but rather worked together and based on their own competences. Similarly, CL1 describes one success factor of the project was the cross-functional work that was achieved. Another success factor of Project X explained by PL is that the project group disconnected from the rest of the organization and worked very separately as “it was nobody that dared to grab us either, so we had to run pretty much on our own actually [own translation]” (PL, 2023). In other words, concerning the organizational structure of Project X PL means that “We were very flat [own translation]” (PL, 2023). According to LIT, everyone in the project group was open minded and ready to learn more, even if something was not within their area, and the team had the same level of ambition, curiosity, and desire to do something. Similarly, CL2 perceived the project group as a well-assembled creative team that thinks outside the box. Furthermore, LIT explains that one success factor of the project is that the team could work with a large degree of freedom where minor details were not always questioned so they did not have to run pilot tests all the time. Additionally, PT highlighted that they kept an option for manual mode open in case something went wrong, and PL stated he/she always worked with several options in parallel so the project would not get stuck.

Meanwhile the department group that are working at the new production line of Project X are up to 10 operators today (at writing time), and supported by the subgroups such as quality support, teamleader, maintenance, technician, and department manager (DM). DM selected people based on their interest to learn, eagerness for new things and desire to deliver, where PM state that people freely wanted to join the new production line. Today there are many newly hired younger operators as they are interested in new technology (DM, PM). One reason why OP4 thinks there are many newly hired people at the production line of Project X is that none of the existing personnel wants to be in the new line “[...] but it is because we, we do not want to go, should they ask [own translation]” (OP4, 2023).
4.4.3. Scope, plan, and model for Project X

CL2 and PM both describe the project as a big change. However, Project X did not receive any more directives from the management other than that “there must be lines producing components ‘so do your best’” (PL, 2023). Thus, according to PL Project X was not a planned activity from the start, it was chaotic, and they needed to structure up and break down a plan themselves. OPTL also perceived the project had no complete plan regarding layout from the start. LIT further states it was difficult to estimate which parts of the project most problems would arise from, and what to prioritize in terms of investing resources: “difficult to predict where the problems would appear so we couldn’t do much work beforehand” (LIT, 2023). Additionally, the project got bigger than it was intended, it was not meant to be a digitalization trip, and CL1 describes it like “[...] wait what have they done and ‘Wow’” (CL1, 2023).

PM states that change management needs to work in parallel with technical projects, as both the technical- and human aspects must be addressed and the project management tends to look at the technical aspects. According to PL (2023) at the beginning of Project X “we had a time plan, but I scrapped it”. They worked according to an organizational standardized project steering model (PSM) (DC, PL, CL2, LIT, PM), which is built upon a stage-gate method, with different milestones set up at each gate (LIT, PT, PM). Additionally, whilst the project has followed a stage-gate methodology, some agile working methods have been adopted in that there were iterations of all new technologies (LIT, PT). CL1 and CL2 mean that Project X did not follow any specific change management model, though CL1 thinks that the procurement models and PSM have a lot of guides and checklists including some elements of change management. For instance, ensuring the right competencies and involving operators early in the project (CL1). OPTL state machine specialists were involved early in the project, to address what is most efficient from a processing point of view, further strengthened by PL who state they involved talented operators in the programming of robots. Since CL2 works with an ADKAR model within another project at the case company, he/she concluded that from the model there were very few activities addressing Desire in Project X. Furthermore, part of implementing digital changes such as Project X involves motivating people, as there can be many ups and downs when it comes to an individual’s feelings of motivation and to be a part of a change project. Thus, leaders that are involved with Project X have their own strategy of motivating people towards a change (see table 4.4.3).
Table 4.4.3. - Project team members description of how they were motivating people towards change within Project X. [own construction]

4.4.4. Information and education

Regarding competences, PL means everyone had to brush up on their knowledge by themselves depending on what was missing. LIT similarly describes it as ad-hoc, where they sought information continuously as they initially did not know what they needed, and thereafter created educational packages. CL2 believes information was sought by themselves, through suppliers or internal contacts. DM helped to ensure the right competences existed among operators by scheduling time for all operators to go on education opportunities arranged by the project. PT sums up the different educational aspects of the project as: 1) machine-related (continuous with the machine supplier), 2) AGV-related (occasional error-specific), and 3) order management (continuous based on updated instruction manuals). Another approach as described by OP2 is the method of observing and learning from those that have already learnt. Regarding the education arranged by the project, OPTL means it came too late as they had by then already faced problems without the proper knowledge, which creates poor conditions for everyone to keep up. Additionally, OPTL highlights there has been a lot of learning new things with no recovery between occasions, and that it has been difficult to teach and explain to others even if you solve something. However, LIT claims it was hard to prepare the organization prior to Project X being up and running, as they did not realize what the project would entail beforehand, yet acknowledges that they could have been faster and clearer with communication regarding new IT applications (e.g., visualizations and decision documents).

Regarding how information was distributed throughout the project, PL states there were management meetings and presentations arranged by PL, and pulse meetings within the project twice a week for task divisions. Initially little information was given to people outside of the project, as indicated by CL1, CL2, OP4 and OPTL who described it as a shock when machines suddenly just showed up. However, as soon as the project group knew that the
project was not just a normal project, LIT claimed information was given to the rest of the organization. At the same time, LIT stated that information was not given continuously to the whole organization during the project, but that key stakeholders were kept informed. For instance, DM indicates that information has been continuously given regarding updates on work methods, which DM has been transparent with towards the operators. This is strengthened by OP3 who states information has been given continuously from leaders based on necessity. Meanwhile CL1 and CL2 had bad insights into what was happening during the project. At the end of the project, information was presented locally and globally within the organization (LIT), and externally through benchmarking (CL1, CL2). Films were created and presented to higher management, yet presentations toward other departments internally were lacking (CL1, CL2).
5. Analysis

The following section presents an analysis of the empirical findings. Initially the theoretical perspectives on change management are compared to the findings of the practical setting before the theoretical aspects of digital transformations are compared against the case company’s situation. Thereafter, the respondents' perspectives on attitudes towards digital change is compared to the theoretical findings on resistance and behavior, followed by a comparison of leadership traits and communication styles. Lastly, the chosen approach for designing Project X is analyzed through the highlighted criterias in the theoretical framework.

5.1. Change management

According to Hallin, et al. (2020) it is important to analyze the characteristics of change to adopt the best approach towards working with the change, in terms of models, what to change and ensuring the right resources. The characteristics of change at Project X have been partly described yet may not have been consciously considered when choosing the right approach. In terms of volume, CL2 and PM both describe the project as a big change, whilst CL1 means the project got bigger than first intended as it was not meant to be a digitalization trip. Regarding time, DC, PL, CL2 and PT highlight one limitation for the project was a short time frame. These statements match Feng et al. (2016) description of a radical change in that it is large-scale and happening over a shorter time frame. Furthermore, Project X has been described as an initially unplanned change (PL, OPTL), where it was difficult to estimate where problems would arise and which parts to invest more resources into (LIT). Thus, at least initially the project matches an unplanned change (Jager et al., 2021), and with the limited initial predictability the environment surrounding the project would be considered complex or dynamic as described by Boonstra (2022).

For complex or dynamic environments, Boonstra (2022) states an organizational change perspective may be more effective than a planned change approach. Meaning the organization should work more on its ability to adapt to changes, ensuring the right competencies for managing planned and continuous changes (Hallin et al., 2020). This has indirectly been addressed in Project X in that all people involved have had to learn new things (LIT, CL2, PT, PM), and get more experience of working with changes simply by being involved. Additionally, new necessary competencies have been added (PL), e.g., new system engineers for maintenance (CL1). However, the main approach adopted in Project X is that of a planned change as it has been conducted in the form of a project which according to PL and LIT followed a stage-gate model with their PSM. Therefore, Project X does not directly follow the advocated approach according to Boonstra (2022).

5.2. Digital transformation

Digital transformations sometimes involve incremental or radical innovations (Liu et al., 2022), which was also the case for Project X. In the beginning of Project X, the project...
group decided to develop something new, a so-called cobot, that was not only an improved AGV but had new functions. The cobot could not only move around obstacles (DM) but pick up components (PT) and load machines (PM), which was something new to the organization (DM) and to the market (PL). In other words, the cobot can be defined as a radical innovation (Liu et al., 2022). Additionally, the cobot in some terms has changed the way the case company was working from before (OP1) and is a part of a new more flexible production concept (PL, PM). This new production concept led to benchmarking (CL, CL2), where other organizations have embraced the new concept to their own (PL). In other words, the radical innovation and new production concept seems to be a radical change (Feng et al., 2016) that helps the organization to introduce new technology (DM).

The complexity of technology involved in a digital transformation affects the time spans required for implementing the new technology (Kadir & Broberg, 2020), and has different impacts on the skills and competences of how people involved do their work (Balsmeier & Woerter, 2019). This held true for Project X where 1) the project group had to brush up on their knowledge of the technology before implementation (PL, LIT); 2) operators within the new line needed to understand the new technology by going on education (DM, PT), learning from others and observing (OP2); and 3) the new line required a better analysis ability for the operators (DC). Furthermore, the cobot as a radical innovation, was a combined hardware and software digital solution which thereby should indicate a longer time span is required for full implementation. This may also have been the case for Project X, as the project was very time-pressed (DC) and left many residual points (OP1, OPTL, see table 4.2.4). Additionally, there seems to be a divided view as to whether the project is still going or not, where at least the operators perceive it as ongoing. At the same time, PL and LIT (see table 4.2.4) means that there is often ignorance or overestimations around digitalization, and that it sounds more difficult than it is or takes a lot of time, which indicates they do not believe more time necessarily was needed. Thus, it is unclear whether the planned time span for Project X was sufficient or not, yet the new technology set new requirements regarding competencies and to what degree may have been affected by the fact the project involved a radical innovation.

5.3. Individuals’ resistance and readiness

McLaren et al. (2022) highlight that resistance is a normal human response to changes as individuals tend to favor the current status quo and are reluctant to give up their habits. However, all respondents claim they like changes (see table 4.2.2) and based on the positive first reactions to Project X, the respondents can be perceived as having a promotion behavior (Petrou et al., 2018). Furthermore, Endrejat et al. (2021) highlight the importance of ensuring people have/feel autonomy, competence, and relatedness. Autonomy has been ensured within the project group in that PL has worked with several options in parallel, and they have ensured a way out by keeping a manual mode option in place (PT). Relatedness has been addressed in the project to the extent of how well people have perceived the necessity of the change (see awareness in section 5.5.1), whilst competence is addressed in that everyone had to learn new skills (PM). Thus, the negative feedback with regards to education and
information coming too late for the operators (OPTL) is a sign of too little attention given to competence among the operators.

Despite all respondents having a positive perspective on change, several factors of perceived concerns among the people around them are still raised (see tables 4.2.3-4.2.4). Some of the examples raised match Kadir and Brobergs (2020) descriptions of negative and positive impacts on peoples’ well-being before, during and after implementation of new technologies. For instance, before implementation OPTL expressed concerns over having the energy to learn everything that was needed (see table 4.2.1), which matches Kadir and Broberg (2020) example of questioning skills and competence. Concerns about competence were also highlighted by DM as a common trigger of concern (see table 4.3.2). One perceived factor of concern before implementation that was highlighted by the respondents and not highlighted in the theoretical framework is that people did not initially believe in the change (PL, LIT and PT, see table 4.2.2 and 4.2.4), and “this is just a dream [own translation]” (PT, see table 4.2.1). Although most respondents expressed positive feelings about Project X before implementation (see table 4.2.1), and e.g., PL, DM, OP1, OP2, and OP3 were excited or happy to be a part of the change, which is a positive impact also raised by Kadir and Broberg (2020).

During implementation some perceived positive impacts were that unexpected individuals blossomed (DC, CL1, CL2, DM, see table 4.2.3), and according to PM (see table 4.2.3) the new young operators were interested in the new technology. However, similarly to Kadir and Brobergs (2020) conclusion, most examples of impacts during implementation were negative. For instance, several respondents have perceived that disturbances and the new technology have caused stress and frustrations (PT, CL1, see table 4.2.4), and OPTL (see table 4.2.4) highlight that the project has been too focused on output which has caused frustrations. This relates to Kadir and Brobergs (2020) negative impact example of people feeling stressed about potential red numbers and alarms, and Ito et al. (2021) example of work overload as a source for resistance. Similarly, OP4 believed that there are unrealistic expectations causing stress (see table 4.2.4), which Lines et al. (2015) highlighted as a cause for resistance. Additionally, OP1 claims that some people find automation to be difficult to learn (see table 4.2.4), and according to PT and OPTL (see table 4.2.4) older people may find the new technology more difficult than the younger people, which supports Ito et al. (2021) identified ‘feelings of inadequacy’ as a potential source for technology-specific resistance. Furthermore, frustrations over existing residual points have been brought up by OPTL, OP1, OP4, (see table 4.2.1 and 4.2.4), and both OPTL and DM highlight that information and education has been given too late. These examples relate to Kadir and Brobergs (2020) frustrations of partially developed solutions and information limitations, but also lack of training material.

Regarding perceived attitudes after implementation of new technology, CL1 and DC (see table 4.2.4) claims the project group may have been disappointed with the lack of support for implementing new maintenance standards, which relates to Kadir and Brobergs (2020) point about frustrations over lack of standards. Furthermore, OPTL, OP1 and OP4 highlight there has been very little support from the project team in addressing the issues of residual points left to solve. Thus, there exist some frustrations in lack of management commitment (Kadir &
Broberg, 2020). However, CL1, PL, LIT, DM, PT (see table 4.2.3), all highlight a change in attitude after implementation among the people involved in Project X as people see that it works and may dare to go further than before or want to be more involved. Additionally, DC claims people got more motivated by the new ways of working, in being able to work more creatively and closely, which is also a positive impact highlighted by Kadir and Broberg (2020). Furthermore, several respondents highlight the success in better ergonomics brought about with Project X (DC, OP2, OP4, PT, OP3). Thus, a majority perceive the attitude as positive after implementation, which is a conclusion similar to that of Kadir and Broberg (2020).

Other technology specific resistance such as concerns of losing a job position or power identified by Ito et al. (2021) has not been voiced among the respondents with regards to Project X, however PL share a similar belief as he/she states most opposition is raised by the middle management as they fear losing their voice in the room. Furthermore, another factor of resistance as highlighted by Jager et al. (2021) is that negative attitudes towards change can often originate from earlier negative experiences. For instance, DM describes a bad experience from a big workload in a refurnished factory which may have been the cause for why DM, despite thinking the project will be fun and successful, was a bit reserved in the beginning of Project X. Another example matching Jagers et al. (2021) highlighted resistance factor is OPTLs earlier experiences of projects that do not mirror the reality and that are driven by visionaries where operators are trying to make things work. This may be the cause of why OPTL was skeptical about Project X and did not want to be involved at first (see table 4.2.1). Additionally, OP4 and his/her negative experiences with lots of residual points and errors within new projects is stated as a reason as to why he/she does not want to be involved in Project X. This perspective from OP4 is also described by OP1 and OP3 who state they have heard lots of negative talk about the project and its many disturbances from other people who are not involved in the project (see table 4.2.4).

5.4. Leadership traits and communication styles in Project X

To succeed with change, trust in management is one of the key factors to reduce the number of resistance (Petrou et al., 2018), as individuals who trust their leaders are more ready for change (Matthysen & Harris, 2018). However, PL highlights that there was fear from the management, who did not believe in the project nor understood what it meant, and that there was a lack of commitment (see table 4.2.4), which made PL hesitate in referring to his/her management in all questions. This could be interpreted as a lack of trust towards the management from PL. Meanwhile there are examples of responses given which indicate trust exists towards PL, in that PT and PM both claim the project would not have been successful without PL (see table 4.2.3). Furthermore, PL describes himself as interested in changes (see table 4.3.1) and that it is important to communicate with honesty (see table 4.3.2). All these factors relate to demonstrated commitment towards the change and having the proper capabilities which are traits highlighted by Abbu et al. (2022) as characteristics necessary for fostering trust. Other necessary characteristics highlighted as necessary for the leadership in a digital transformation is to take risks, experiment, and have vision (Imran et al., 2021).
These traits are highlighted in PL, who is perceived or describe him/herself as a risk taker (PT, PL), let his/her team wreak havoc and have freedom in pursuing solutions (PL, LIT), and is described as a visionary (PL, PM) with enormous drive (OPTL).

Concerning trust (Petrou et al., 2018) on the production line of Project X OPTL hints at there being a trustful environment in that he/she states you know what everyone thinks, and it is not difficult to discuss concerns (see table 4.3.2). Additionally, DM and OPTL are described as present, helpful leaders that are knowledgeable and easy to talk to (OP1, OP2, OP3, see table 4.3.1). These descriptions relate to Imrans et al. (2021) description of a leader having proper communication skills, and Abbu et al. (2022) description of a leader having the proper capabilities. Furthermore, Battilana et al. (2010) claim leaders can be people-oriented or task-oriented, where DM and OPTL can be described as people-oriented based on the relationships between themselves and the operators. For instance, there exists a certain trust between them where OPTL means he/she can vent to his/her boss when problems arise (see table 4.3.2), and OP1, OP2 and OP3 states they can raise concerns and the leaders would listen and embrace problems if needed (see table 4.3.2). Additionally, DM identifies himself/herself as a listening and visual leader (see table 4.3.1). Meanwhile, OPTL highlights that he/she wants people to feel like they can vent to him/her.

Task-oriented leadership works towards direction, structuration, and design to reach goals and targets (Weber et al., 2022). Something that fits in the descriptions of both LIT and PT about themselves as a leader (see table 4.3.1). LIT highlights he/she strives to live by the way he/she learns and to deliver things. Additionally, LIT describes him/herself as task-oriented by highlighting how he/she works towards his/her own direction and design of reaching the goals. Followed by PT that tends to focus much on the future targets by “[... just look ahead all the time and be pushing to implement new things all the time] [own translation]” (PT, 2023). Similarly, PL describes himself/herself as a task-oriented leader in that he/she “Focus on the critical line in the project [own translation]” (PL, 2023), meaning that he/she can focus on what is important or not for the project. Additionally, PL is perceived as a bit too focused on the output and results, not anchoring the project in reality by not looking at the situation properly before moving on to other projects, which OPTL believes may be due to his/her drive. At the same time, PL can also be perceived as a people-oriented leader, in that he/she describes himself/herself as a leader who praises, challenges, and listens to others and who works with consensus (see table 4.3.2).

Another factor to succeed with changes is according to Jager et al. (2021) the necessity of communicating the right way, and Endrejat et al. (2021) pose three communication styles: autonomy-restrictive, autonomy-supportive, or reflective listening. Some examples of autonomy-restrictive communication styles are hinted at based on the responses given by the respondents’ (see table 4.3.2). For instance, DC (2023) states “There shouldn't be a huge amount of room for different interpretations [own translation]”, which could be perceived as an intention of minimizing variations in perspectives, the opposite of an autonomy-supportive communication style. Additionally, LIT’s response of trying to make an individual understand the whole picture and why a change is important, PT’s intention of explaining what is important with the change, and PM’s similar description of explaining the ‘why’
change, could all be interpreted as a *righting reflex* as explained by Endrejat et al. (2021). Furthermore, PT’s (2023) "I would just answer that, a little harshly, that if we don’t do this trip now, we will not be here anymore [own translation]", could be interpreted as a persuasive or argumentative response, and thereby indicate an *autonomy-restrictive* communication style. This statement by PT can also hint at an *avoidance motivation approach* as described by McLaren et al. (2022).

In addition to the *autonomy-restrictive* responses hinted at above, there are several examples of *autonomy-supportive* responses. For instance, PL means you should break concerns into components and look for what is true, while DC states it is important to "go to the bottom of what the concern depends on [...] [own translation]" (DC, 2023). These examples indicate an acknowledgement of another individual’s perspective, and attempt at understanding another individual's feelings, which is highlighted by Endrejat et al. (2021) as aspects of *autonomy-supportive* or *reflective listening* communication styles. Furthermore, CL2 means it is important to listen and give people space to vent their concerns, which may require active listening skills as highlighted by Aitken and von Treuer (2021). Additionally, DM means it is important to find the triggers, ask questions and see where the doubts originate from, which is in line with a sincere communication style as advocated by Aitken and von Treuer (2021). Similarly, CL2 means it is important to be open and honest about what is happening and help to clarify questions. Thus, the respondents show signs of both *autonomy-restrictive*, and *autonomy-supportive* communication styles, where some could be interpreted as both (DC, PM), some more *autonomy-restrictive* (LIT, PT) and others more *autonomy-supportive* (PL, CL2, DM).

5.5. Designing a digital change

According to Imran et al. (2021) it is impossible to go through a digital transformation, without changing the organization. This holds true for the case company to a certain extent, as the organizational structure may not have changed (PT, LIT, CL1), yet the project showcased how there is a higher need for involving IT within projects (LIT), and the case company has begun to create their own IT sub-organization (CL1). Furthermore, Project X has caused a change in mindset within the organization, where the managers dare more, and other digital change projects have been initiated (CL1, CL2). However, it is also highlighted that further changes in mindset are needed especially for the middle managers, as they are perceived as more resistant and need to understand there are new ways of working (PL, table 4.2.4).

Adopting new digital solutions requires an ability and flexibility to adapt to changes quickly (Hanelt et al., 2021), which implies having the right people and competence may facilitate succeeding with digital change projects. For the case company, DM was picking his/her own team to the new line by looking at who was most suitable and interested to learn about the new technology. Additionally, individuals’ freely chose to join Project X (PM). Furthermore, when it comes to adapting digital changes, Machado et al. (2021) highlights working with cross-functional teams helps an organization to leverage knowledge about digital
transformation, and make sure everyone understands it. This was also the case for the project team as they worked cross-functionally, where people from different departments and specialist areas worked together and potentially may have been the cause as to why knowledge spread quickly within the project group (DM). Additionally, the project group is described as creative and thinking outside the box (CL2), which relates to a positive side effect of working with cross-functional teams in that it encourages people to think differently (Kane et al., 2017). Additionally, CL1 highlights one success factor of Project X is that a good cross-functional work was achieved and inspires future projects.

An organization's ability to adapt to digital solutions can sometimes be affected negatively, for instance by having a hierarchical system (Imran et al., 2021). Such a hierarchical structure can be seen at the case company (PT, LIT, CL1, see section 4.4.2). However, whilst the organization has a hierarchical structure, the project group of Project X were very flat (PL), nobody had a specific role when working, and the group were very separate from the rest of the organization (LIT). The project team thereby worked very individually and when it came to questions about details regarding the project, they solved it by themselves (PL). Thus, the team had a certain degree of autonomy as advocated by Endrejat et al. (2021), which may be why the majority of people involved in the project had a positive attitude (see table 4.2.2) whilst there is some perceived resistance outside of the project group (CL2, DM, PL, OP1, see table 4.2.4). Disconnecting the project group from the rest of the organization is furthermore highlighted as one of the key success factors of the project according to PL and LIT additionally highlights the degree of freedom given to do what they want and not run tests on every minor detail as a success factor. Thus, the difficulties of having a hierarchical system may have been refuted by the project group separating themselves from the organization.

On the other hand, separating themselves from the rest of the organization may have affected the information flows within the organization with regards to Project X. For instance, CL1, CL2, OP4 and OPTL describe that they did not know about the new line until it was implemented, and according to then it was a shock and suddenly there were new machines. Meanwhile, LIT claims information was given as soon as they knew the project would not be normal, and that key stakeholders were continuously updated with information during the project. However, as highlighted by Saatci and Ovaci (2022) all levels of employees should be informed about strategic and functional objectives to ensure everyone accepts being a part of the change. Due to the project being separate from the rest of the organization, this responsibility would fall on PL. Based on the fact that there is perceived negative attitudes outside of the project (OP1, OP2), limited presentations of the project results has been made across departments within the organization (CL1, CL2), and not every respondent were aware of the project strategy (OP2, OP3, CL1, CL2), it can be interpreted that some information flows were lacking.

Regarding strategies, Kane et al. (2017) state the importance of having a digital strategy to increase the awareness and the knowledge about future technology or digital projects such as Project X. Based on Matt et al. (2015) description of the four dimensions, a digital strategy can be interpreted when putting together the respondents' different perspectives. For instance,
an attitude and ability to exploit and use new technologies (Matt et al., 2015) is discerned from the stated desire to adopt new technology such as cobots and AGVs (PL, OP1, OP4). Financial pressure and resources for funding the transformation (Matt et al., 2015) is addressed in the pursuit of reducing costs by producing the component in-house (DM, PM, OPTL). Organizational setup and structure changes due to technology (Matt et al., 2015) is stated in the goal of lights out and running without operators (PL, DM, PT, PM, OPTL, OP4), whilst changes of value creation and how technology impact the business model (Matt et al., 2015) is addressed in the strategy of increasing the production flexibility for future product customizations (PL, PM). Furthermore, the digital strategy must also be structured in such a way that everyone in the organization has understood it (Lau & Höyng, 2022), which was not the case for Project X as the strategy seems to be perceived in different ways. For instance, whilst respondents were aware of different aspects of the strategy (as presented above) none seems to have an awareness of all the aspects, and CL2, CL1, OP2 and OP3 did not know about any strategy within the project at all. This lack of awareness of a strategy also relates to the lack of perceived necessity of Project X (OP2, OP3, CL1, CL2), as Hanelt et al. (2021) highlight that informing of the purpose and reason of why the new technology is important is a way of involving people in a digital strategy.

5.5.1. Working with methods

Imran et al. (2021) claim digital transformations involve both social and technical aspects, and PM similarly describes that working with technical projects requires working with change management in parallel, as it is important both with the technical and social aspects. Regarding project management methods, agile implementation processes are advocated as the utility of stage-gate methods for implementing process innovations in an environment of fast paced technological changes are questioned (Sjödin et al., 2018; Imran et al., 2021). However, Project X followed a PSM model with different phases and milestones (LIT, PT, PM), based on a stage-gate methodology (Hallin & Gustavsson, 2015). Although, according to LIT some agile working methods were adopted in that all new technologies involved iterations. Additionally, as described by PL the project team had two weekly meetings for division of tasks, yet as explained by Sjödin et al. (2018) agile methods tend to include daily meetings. Thus, the project seems to mainly have followed non-agile processes based on the responses given.

According to CL1 and CL2, Project X did not follow any specific change management model though some elements such as involving the right people early were addressed in the guides and checklists included in the PSM. The first step of the ADKAR model, Awareness, involves informing individuals of the need for the change (Hiatt, 2006), which PT means he/she thinks everyone is aware of (see table 4.2.3). However, based on the responses given OP3 were not aware of any necessity at all, and some respondents only perceived the needs partially. For instance, some are aware of the necessity of producing the component in-house (PL, CL2, PM, OPTL), within a short time frame at necessary capacity (DC, PL, CL2, PT), and some that there is a need for flexibility for future demands (PT, DM, OP2). Thus, Awareness may have been partially addressed in the project, but not to a full extent. Regarding the second step Desire, motivating individuals to participate and want the change
(Hiatt, 2006), CL2 means there have been few activities of this step within Project X. Meanwhile, PL claims he/she felt people had to be motivated every day, by having fun meetings, a close knit-group, responsibilities distributed and by ensuring everyone felt like they were developing. At the same time LIT believed it was people outside of the team that frequently had to be motivated by visualizing the target image and packaging it in a simple aesthetically pleasing way (e.g., through powerpoint). Thus, some desire related activities may have been conducted, and LITs motivation technique of visualizing the target image could be interpreted as an example of an approach motivation method of making people desire the change by highlighting the possibilities of the future (McLaren et al., 2022).

The third and fourth steps of the ADKAR model involves ensuring the right knowledge exists required for the individual to know how to change, and acquiring the skills and behavior necessary to implement the change (Hiatt, 2006). In terms of knowledge, the project team members had to learn a lot by reading up on things themselves (PL, LIT, CL2), and OPTL had to figure out how to solve errors when they first occurred (before education came out). In terms of acquiring the right skills and behavior for the change DM made sure all operators had time scheduled for education. PT claimed there were continuous education opportunities with suppliers regarding the machines, occasional education regarding specific AGV errors, and continuously for order management. Though, LIT highlights they could have been faster with updates on instructions regarding the IT related changes in functions. Thus, knowledge and ability has been somewhat addressed in Project X. The last step reinforcement concerning what is needed to maintain and sustain a change (Hiatt, 2006) has not been mentioned nor hinted at by the respondents. Rather, OPTL, OP4, OP1 highlight concerns regarding residual points not addressed by the project, which could indicate a neglect of focus on evaluating and following-up on the outcome of the Project thus far.
6. Discussion and conclusion

This study aimed to answer the following question: **How can organizations work with change management within a digital transformation project to facilitate a change?**. The results of the study indicate seven actions which should be considered: 1) analyzing how the conditions of the change affects the approach; 2) set the scope of the project by identifying the characteristic of the technology; 3) analyze different individual behaviors and potential causes of resistance the project may involve; 4) involve task- and people oriented leaders who are trusted or has the right leadership traits to create trust; 5) carefully select an appropriate team and make efforts to ensure autonomy and/or a non-hierarchical project structure; 6) formulate and communicate a transparent digital strategy; and 7) adopt both a change management- and project management model for the digital change project.

The first aspect involves identifying the conditions and characteristics of the change to choose an appropriate approach. Based on the respondents’ description of Project X (CL2, PM, CL1, DC, PL, PT, OPTL, LIT), it can be described as a **radical change** (Feng et al., 2016) in a **complex environment** (Boonstra, 2022). For these circumstances Boonstra (2022) highlighted an **organizational change approach** with focus on the organizational ability to manage change, yet the project followed a **planned approach** by using their PSM (PL, LIT). Thus, Project X did not directly follow the preferred theoretical approach, yet because the respondents deem the project a success (see section 3.2) it may not have had a significant impact on the project. Therefore, based on the results of this study the theoretical claims of the most effective approach compared to the existing environment cannot be confirmed nor denied. At the same time, it is important to note that the responses given did not indicate whether the environment of Project X changed during the course of the project, which would have changed the preferred approach. Therefore, it can be concluded that regardless of which approach is theoretically advocated, it is important to consider that it may not hold true for the duration of a whole project as the environment may change. Thus, if an approach is chosen based on theoretical claims it is important to continuously analyze the environment to ensure the right approach is still valid.

The second aspect includes analyzing how the technology involved in the digital transformation may affect the scope of a digital change project. Project X involved a radical innovation (Liu et al., 2022), such as the cobot (PL, DM, PM, PT), which was a software and hardware based digital solution. Thus, the project theoretically would imply a bigger impact on the skills and competences necessary (Balsmeier & Woerter, 2019), and may take longer time to implement (Kadir & Broberg, 2020). Concerning the competence requirements, PL, LIT, CL2, PT & PM highlights there are differences and they have had to learn a lot of new things. However, concerning the time frame of the project, the official timeline of 1,5 years (PL), may have been too short for the project, as there seems to be a divided view as to whether the project is finished or not and the operators OP1, OPTL, OP4, claim there are lots of residual points left to address. Thus, for a digital change project such as Project X, involving radical innovations of a software- and hardware based digital solution, it is important to consider how the technology will impact the competencies required of the
people involved and account for the project taking longer time than expected. Additionally, it is important to address residual points before moving on to other projects. Due to the higher competence requirements of a radical innovation combined with a short time frame, digital change projects may benefit from adding an additional new (temporary) operator role in the project aiming to alleviate and support the team working with the new technology, e.g., with addressing residual points.

One of three areas highlighted by Hallin et al. (2020) as necessary to address when working with change projects involves identifying important actors and understanding their reactions to manage a successful change. Reactions can be negative or positive and are called resistant behavior and change readiness respectively (Endrejat et al., 2021). Concerning resistance and readiness, a somewhat unique aspect of Project X is that all respondents can be perceived as having a promotion behavior (Petrou et al., 2018), where most are also interested in new technology (OPTL, OP3, OP4). Thus, the project may not have faced as much resistance as it would have if more respondents showcased a prevention behavior. Instead, the respondents have highlighted most perceived resistance originating from people outside of Project X (PL, LIT, OP1, OP2), or mainly in the during implementation phase. One source of resistance as highlighted by Ito et al. (2021) is a fear of losing a job or power, which was not raised for Project X potentially due to the production line being completely new and not affecting existing production lines or jobs. Thus, for Project X there exists certain conditions that might have factored into there being less resistance towards the digital changes, which thereby may have had an impact in the success of the project. However, minimal resistance cannot be assumed for all projects, and as stated by Jager et al. (2021) negative attitudes towards change can originate from negative earlier experiences, which was also the initial response for DM, OPTL, OP1 and OP4. It is therefore important to, regardless of project conditions, analyze if there are any previous negative change experiences or lessons learned within an organization or for the people involved in a new digital change project. Additionally, it is important to analyze if a digital change affects any psychological needs (Endrejat et al., 2021), or involve any technology-specific resistance factors (Ito et al., 2021). Regardless, based on the results of this study it can be concluded that establishing similar conditions to that of Project X, if possible, could help to facilitate the management of a digital change.

Another area necessary for managing change projects as highlighted by Hallin et al. (2020) is ensuring the right leadership. Regarding leadership there was a lack of trust towards the management as expressed by PL, yet the project team believed in their project leader (PT, LIT, PM). One factor highlighted as key for the project success was the risk-taking and visionary traits of PL (PL, PM, LIT). Additionally, having leaders who are both task-oriented and people-oriented is necessary for successful digital changes (Battilana et al., 2010), which was also the case for Project X who had LIT and PT as perceived task-oriented leaders and DM and OPTL as perceived people-oriented leaders and PL perceived as both. Furthermore, Endrejat et al. (2021) means leaders' communication style can affect resistance, and communicating is essential to succeed with changes (Jager et al., 2021). The respondents show signs of both autonomy-restrictive, and autonomy-supportive communication styles, where some could be interpreted as both (DC, PM), some more autonomy-restrictive (LIT,
PT) and others more autonomy-supportive (PL, CL2, DM). Although, due to the minimal resistance for Project X, it remains unclear whether the communication style has been a significant factor to the success of the project. Thus, it can be concluded that a lack of trust may impact the structure of a project, and it is vital to ensure people believe in their leader. If there is no trust in the leadership, people may refrain from involving the leaders in certain discussions and may go their own way. Furthermore, the results of this study support Battilana et al. (2010) claim that it is important to have both task- and people-oriented leaders, yet the impact of communication style remains inconclusive.

A third area highlighted by Hallin et al. (2020) as relevant for managing change projects are planning of activities and goals of the change. One activity in planning for a digital change is to put together a team. According to Hanelt et al. (2021) it is important to ensure the people involved have a flexibility to adapt, which the project did in that operators involved were chosen carefully by DM and the project group members were given a certain freedom to develop their own digital solutions (PL, LIT) - effectively ensuring they had a sense of autonomy (Endrejat et al., 2021). Additionally, it is important that the team is cross-functional to be able to leverage the existing knowledge within the organization (Machado et al., 2021), which is also highlighted as a success factor for Project X (CL1). Furthermore, Project X disconnected from the hierarchical organization and operated separately with a less hierarchical system (PL), which combined with the autonomy may be a key to why the project was considered a success as it entailed a larger flexibility for the team to adapt to changing circumstances within the project. Thus, it can be concluded that working cross-functionally and carefully selecting people to ensure a mix of competencies and flexibility when putting together a team is important for managing digital changes. Not having a cross-functional team may lead to gaps in addressing different perspectives of a solution, a reduced reach of contacts internally to leverage knowledge, or a reduced responsibility for each individual if there are multiple people from the same area of expertise (which in turn may affect autonomy). Additionally, one way of circumventing the issues of operating under a hierarchical organization for a digital change project could be to try and separate the project from the rest of the organization or taking measures to ensure autonomy within the project itself.

In relation to establishing goals of a change (Hallin et al., 2020), one aspect of designing a digital change involves sharing information, as all levels of employees should be aware of both strategic and functional objectives to ensure everyone accepts being a part of a change (Saatci & Ovaci, 2022). Based on Matts et al. (2015) description of a digital strategy containing four dimensions, it can be concluded that Project X has a digital strategy. However, all respondents were not aware of all the dimensions of the digital strategy (OP2, OP3, CL1, CL2), nor were the goals of the project clear as there seems to be a divided view over whether the project is finished or not. Thus, there has not been transparent information flows to all people involved. Additionally, people outside of the project have been perceived as negative towards the change (see table 4.2.4), not accepting being a part of it (OP4), and there was a lack of presentations of project outcomes given to people in other departments outside of Project X that was not the management (CL1). The limitations in information
flows could be caused by the project team separating themselves from the rest of the organization, the digital strategy not being structured or phrased officially for the project, and/or lack of transparency to other departments. Thereby, when managing a digital change, it is important to clearly formulate a digital strategy which is communicated transparently and clearly to everyone of interest. Similarly, project outcomes should be presented not only to management but to the whole organization to start building acceptance. For instance, project strategy and goals can be presented on visual boards in relevant production lines and be accessible on internal network platforms. If there are changes in the goals, everyone should be updated, and fulfillment of goals should help to clarify the progress and end of a project.

Another aspect of designing a digital change involves choosing an appropriate model of working with the change, which according to Imran et al. (2021) and PM should involve both technical and social aspects even though project management often tends to only look at the technical aspects. Similarly, for Project X a project management model was adopted through the PSM (LIT, PT, PM), whilst no stated change management model was followed (CL1, CL2). However, upon analyzing the respondents’ answers in relation to the ADKAR model, it was clear that all aspects of the model were at least partially addressed in the project except for the step of reinforcement. Thus, the project successfully addressed both technical and human aspects, yet could potentially have been more successful concerning e.g., information flows, and unclarity surrounding residual points and project ending if a change management model such as the ADKAR model had been fully adopted. Furthermore, the chosen PSM model based on a stage-gate methodology (LIT, PT, PM, DM), does not match the theoretically advocated agile models (Sjödin et al., 2018; Imran et al., 2021). However, the overall success of the project indicates that Project X neither supports nor refutes the theoretical claims, and the choice of project management model may not be a key success factor so long as a model exists. In conclusion, adopting both a change management model and a project management model is important for managing digital change projects in order to not miss any important social- or technical aspects.

6.1. Future implications and research

The results of this study contribute to research in that it gives perspective on how change management relates to digital transformations concerning radical changes and -innovations in an automotive industry. The results support Kadir & Brobergs (2015) study on human well-being in relation to implementing new technology, and further highlight the impacts as potential resistance or readiness factors for technological change. Furthermore, the study results can be utilized in practical settings when it comes to digital change projects in that it describes different aspects to consider in approaching the digital change: 1) how to choose approach based on the characteristics of the change and the environment; 2) technical aspects of how the digital solutions involved may affect the scope and time frame of the project; 3) social aspects and understanding reactions from a perspective of resistance and readiness; 4) how to approach the leadership of the project; and 5) how to design a digital change project in terms of team, structure, planning, digital strategy and models.
The study results are limited to digital change projects of similar conditions to the project studied. For instance, in that the digital change involved a new production line rather than an existing line, and all people involved had a choice as to whether they wanted to join or not. Thus, there may have been less resistance than if people would have been forced into the change. Additionally, the project team disconnected from the rest of the hierarchical organization, and the project itself was only one step of a bigger digital transformation. Thereby, further studies are required of digital change projects operating under different conditions, for instance a case concerning a digitalization of an existing production line or of a project with existing well-known resistance. It can be relevant to study digital change projects which are known to have officially adopted both project management and change management models. Further studies on communication styles should also be conducted, utilizing observation methods to validate the conclusions of Endrejat et al. (2021).
References


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Appendix 1 - Interview guide

Ethical consideration checklist (all respondents were informed before the interview):
- Respondent informed of the research purpose and why he/she was selected.
- Respondent informed that their participation is confidential and anonymous, and that there are no correct answers so long as their responses reflected their own perspectives.
- Respondent informed that data collected will only be used for the specific study.
- Respondent asked if recording is ok.
- Respondent approves to be studied.

Purpose with interviews: To gather information on how leaders involved in the digital change project perceived the transformation. Additionally, their attitude and behaviors, and how they perceived their coworkers.
Estimated time per respondent: approx. 60-90 min.

Change management (only CL1, CL2, DM, PM)
- What do you think of when you hear the words “change management”?
- How do you define a successful change?
- You have recently gone through a change involving a new process line, how would you describe it?
  - Did it have big or small impacts on the organization? In what way?
  - How long did the change take to implement?
- What was the reason for the change?
- What is your take on the change project? Do you think it was a success?

Digital transformation (only DC, PL, LIT, PT)
- How do you define a digital transformation and what does it mean for you?
- You have recently implemented a new process line; how would you describe the transformation?
  - What technologies did the digital transformation imply?
  - How long did the transformation take?
- Which areas of the organization were affected in the digital transformation? Generally, how?
- How would you evaluate that the transformation has impacted the organization? (post implementation)

Managing digital change projects (all except for operators’)

Individuals’ resistance and readiness

Respondent in focus:
- What was your role within the change/transformation and what were your responsibilities?
  - Please give examples of activities you did.
    - How did you get involved in the change project?
- Did you have any competences or experiences of these technologies (in the new process line) before the transformation? If so, what technology?
  - How confident were you in your own abilities of embracing the transformation?
- Did you think the project would be successful from the start? Why or why not?
- What parts of the digital transformation affected you the most?
Do you have any negative experience from a previous change project? Describe what happened.

How do you feel about changes in general? Is it something positive or negative? Do you prefer to work following routines or always trying out new approaches? Explain why.

**The respondent’s perspective on coworkers:**

- The new process line meant new machines and a new way of working, how did you perceive the workforce readiness for the new technology?
- What were the main causes of potential resistance towards the digital transformation, as you perceived it?
- What were the main motivators/success factors for the digital transformation, as you perceived it?
- Did you perceive a difference in attitude towards the changes among the workforce before, during and after the transformation? If so, what?

**Leadership in digital change projects**

- How would you describe the ideal leader? *What character traits are necessary to have?*
- How would you describe yourself as a leader?
- If someone approaches you with doubts about a change, how would you respond?
- If you were to be concerned about a change, what would you do?

**Designing a digital change**

- What does the organizational structure and work process(es) look like in your department/team? Has the organizational structure/work process(es) changed after the process line? If yes, how?
  - Do you work with the same tasks as before?
- What was the strategy for the new process line and its implementation?
- How did you prepare and plan for the change/ transformation?
  - How did you set up an appropriate team?
  - How early did you inform your coworkers about the digital transformation/change?
  - How did you make sure the organization had the knowledge to be working with the new process line?
  - How did you make sure that everyone in the organization/your team was aware of the changes?
- How did you work with the transformation under the implementation stage? And how did your teamwork?
  - Did you have any setbacks under your work with the digital transformation? If yes, how did you address the issues?
  - Were there any aspects of the digital transformation project (plan) that were especially successful?
  - If you could have done something differently, would you? If so, what?
- Have you practiced any specific models or methods for this project? If so, can you describe it? If so, can you describe it?
- Did you at any point during the process line project feel like you had to motivate people and how did you do it?
Managing digital change projects (operators’)

*Purpose with interviews:* To gather information on how people involved in the transformation perceived their leaders’ and the transformation. Additionally, the attitude, behaviors and potential causes of resistance.

*Estimated time per respondent:* approx. 30 min.

**Individuals’ resistance and readiness**
- What role did you have in change/transformation and what were your responsibilities? Give example on activities you did.
  - How did you get involved in the digital transformation project?
  - How would you assess that the digital transformation has changed the way you work? (post implementation)
- The new process line meant new machines and a new way of working, how did you feel about the change?
- What parts of the digital transformation affected you the most?
- How confident were you in your own abilities of embracing the transformation?
- What were your thoughts upon hearing about the new process line being implemented? Did you think the project would be successful from the start? Why or why not?
- Do you have any negative experience from a previous change project? Describe what happened.
- How do you feel about changes in general? Is it something positive or negative? Do you prefer to work following routines or always trying out new approaches? Explain why.

**Leadership in digital change projects**
- How would you describe your leader/manager (when working with changes)?
- How would you describe the ideal leader? What characteristics are necessary to have?
- If you were to be concerned about a change, what would you do?
- If you have had any concerns about a change that you brought up with your leader/manager, how did they react? Exemplify.

**Designing a digital change**
- How early did you know about the change?
- How much information did you receive regarding your new tasks before the new process line was implemented?
- Have you felt able to influence the planning of the transformation?
- When the process line was to be introduced, did you understand why it was necessary?
- What was the strategy for the new process line and its implementation?
- Did you perceive any setbacks and/or particular successful aspects of your work during the digital transformation? If yes, what?
- If you were able to decide, how would you have preferred your team to have worked with the digital transformation?