

Meta-Analysis of Digital Transformation in Organisations

Developing a Framework for Digital Transformation in Organisations
by Meta-analysis of Existing Transformation Cases

by

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Abstract

The ongoing surge in internet users worldwide and its complexity causes organisations to digitally transform to stay competitive. Previous research repeatedly emphasised the importance of digital transformation, but the authors see a gap in the literature regarding digital transformation. General change management models have been around, but a more focused framework for digital transformation is hard to find, aside from the solutions offered by consultancy companies. Even the frameworks available have a sole focus on a specific organisational case (Gimpel et al. 2018). On the other hand, the more generalised literature focuses on particular aspects of digital transformation. For instance, Verina & Titko (2019) offer a transformation framework circling the drivers of digital transformation. The authors identified a distinct lack of available literature that can be generalised to all industries of different scales. This research aims to conduct a retrospective analysis of the organisations that have undergone digital transformation using the meta-analysis method. Based on the findings from these cases, the authors have attempted to develop a framework for entrepreneurs, management board executives, change managers, consultants, and researchers to better understand the digital transformation process.

We aim to answer two research questions: *What similarities and differences were observed in organisations that underwent digital transformation in the past?* And *What steps can organisations take to undergo digital transformation?*

Elicited from these criteria, we conducted a meta-analysis on a diverse group of organisations (in terms of industry, location and scale) that have undergone digital transformation in the past. This was done to identify common traits visible in all the organisational change projects based on the research. All these observations were tabulated and then compared across organisations to determine the undercurrent of commonalities. These common trends were utilised to develop an initial framework. After which, all the existing cases were re-evaluated to test this hypothesis. This meta-analytic study was employed to establish the framework for Digital Transformation. On a closing note, the authors tried to discuss the implementation of the framework and the scope of future research. The authors expect that the framework will be helpful for entrepreneurs, managers, and executives looking to undertake a large-scale digital transformation in their organisations.

Keywords: Digital Transformation, Meta-Analysis, Large-scale transformation, Framework for digital transformation, Digital Transformation Case Study, Management, Organisational Change, Industry 4.0.

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Thank you. Dankjewel. धन्यवाद (Dhanyawad).

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1. Introduction

This chapter provides a background for the research on why we chose this topic and what we see as relevant within digital transformation. Also, the existing research and research gap are discussed. After defining the research gap, we explain the purpose and research questions.

1.1 Background

2021 witnessed 4.9 billion internet users worldwide, growing almost 400% from 1 billion users in 2005. This outlines the everyday growing importance of digital systems. Since the COVID-19 pandemic in 2019, another 728 million people have started using the internet (International Telecommunication Union, 2021). Apart from statistics regarding internet users, the authors recognise a few real-life examples of digital technologies impacting an organisation. One of the authors experienced the importance of undertaking digital transformation while working at a growing startup aspiring to be India's leading after-market automotive repair firm. The company pigeonholed itself to solve challenges by focussing on short-term hiring instead of building digital platforms to assist growth. During the pandemic, the company had to undergo massive layoffs and eventually change its strategy to focus on building digital assets. Initially, the changes were challenged by resistance from multiple stakeholders, and it required arduous training to bring everyone on board. Over time, the organisation is reaping benefits (in terms of expansion and profitability) by shifting to a digital strategy (Medium, 2022).

In the book “The Second Machine Age” by Brynjolfsson and McAfee (2014), the authors argue that we are currently in the “second machine age”, often colloquially called the Fourth Industrial Revolution. Like steam engines replacing physical labour back in the day, today we are witnessing computers replacing the human mind. In his book titled “The Fourth Industrial Revolution”, Klaus Schwab (2016) argues that we are already in the fourth industrial revolution and not in an extended third revolution, outlining three main reasons for this. First, the new technologies that are developing do not only change how we do and what we do but also who we are as people and how we behave. Secondly, the benefits that come from digital technologies are developing exponentially instead of gradual linear growth. Lastly, the changes are disrupting systems, industries, and societies altogether. Therefore, Schwab (2016)

and Brynjolfsson & McAfee (2014) are synchronous in their observations and see digitalisation as a disruptive change.

Although digital transformation in organisations has become more prevalent and affordable, most organisations have not made significant progress in the past years (Capgemini Research Institute, 2019). We argue that digital transformation does not end abruptly and should be continuously carried out instead of intermittently. By not taking digital transformation seriously, organisations may be forced to forsake their economic standing.

There are manifold benefits of digital transformation. It assists both data collection and allows the possibility to improve analysis methods. Larger volumes of data and better analysis techniques can facilitate organisations to make better decisions. According to Pemberton (2018), two-thirds of all industry rivals compete primarily on customer experience. Digital transformation allows for such organisations to enhance customer experience. Next, the companies that undergo successful digital transformation improve the efficiency and profitability of internal processes. According to Rander, Koch & Wellers (2021), 80% of organisations that have completed digital transformation reported increased profits, while 85% say they have increased their market share and can expect 23% higher revenue growth than competitors.

1.1.1 Research gap

Although there is a large amount of available practitioner research on how organisations can start their digital transformation journey, there is still a gap in academic research on some critical issues. PwC, Gartner, McKinsey and Capgemini, among many other consulting firms, offer roadmaps for organisations to start a digital transformation journey (PwC, 2021; Gartner, 2022; Mckinsey, 2017; Capgemini, 2011). We argue that the current framework panders to companies with a more significant economic scale of operation, excluding many SMEs from the scope. Consulting frameworks do not allow for internalising digital transformation within the company (Priyoni, Moin & Putri, 2020; Brunetti et al. 2020). Secondly, we found that academic frameworks for transformation often restrict themselves to one specific aspect of the process. Verina & Titko (2019) proposed a framework for digital transformation based on the drivers of change and their expected results. On the other hand, available research often focuses on specific company cases like the framework developed by Gimpel et al. (2018) for optical systems manufacturer Zeiss.

The big consulting firms offer many benefits, but there is merit for organisations that want to use their existing assets to undertake digital transformation. We argue that this is because of a multitude of reasons - resource constraints, intellectual property control, training and development of employees and preservation of endemic knowledge with specialists.

Some research is available on the general applied methodology during digital transformation (Lim, Ng & Tan, 2018). Although there is ample discussion around the benefits of digital transformation, there is still a distinct lack of research discussing the motivation, challenges, processes and roadblocks to digital transformation. The existing research focuses on a comparison between organisations and their levels of maturity in the digital transformation journey (Capgemini, 2019; Stark, 2020). Therefore, we argue that current literature lacks imitability, particularly in industries with fewer examples.

1.2 Research Questions

Entering this study, we want to understand what a successful digital transformation looks like. The following research questions will help us understand:

- What similarities and differences were observed in organisations that underwent digital transformation in the past?
- What steps can organisations take to undergo digital transformation?

To answer the first question, we aim to find differences and similarities in terms of scopes, motivations, processes, challenges, and benefits. We focus on the overhaul of all organisational practices during a large-scale digital transformation. Therefore, we find these categories essential to gain better insights into the entire transformation process undertaken by organisations.

By answering these questions, we aim to offer a generalisable framework for organisations that want to undergo digital transformation.

1.3 Research Purpose

Arguably, it is easier to work in a broken system than try to fix it. A strategic shift toward digitalisation is paramount to maximise long-term gains for an organisation and sustain its economic position. We observed that organisations are often near-sighted in their strategies

and they feel that it is cheaper to stick to business as usual than to undergo digital transformation. Hence, with this study, we want to propose a generalised framework to help organisations in their digital transformation. Our purposes with this study are the following:

- To study the existing transformation frameworks with a fragmented focus on different aspects of transformation. Bring together the insights from these frameworks into a more coherent result.
- Using these inferences to develop a generalised and replicable framework for:
 - Organisations to digitalise their business.
 - Researchers to overcome the initial barrier of extensive literature review.

1.4 Delimitations

The study includes several delimitations, mainly reflected in the selection of case studies for review (see Chapter 3: Method, Section 3.2.1). Firstly, the research is delimited only to consider digital changes at an organisational level affecting all the stakeholders (referred to as large-scale digital transformations henceforth). Secondly, we ensured diversity in the reviewed cases regarding the size of the organisation, industry, location, and success or failure of their transformation projects. As highlighted in the research gap (section 1.1.1), we realised that there is a lack of a generalised framework. By keeping the study diverse, we expect to achieve a more globalised solution for digital transformation. Lastly, the study focuses on holistic parameters affecting an organisation's capability to change. The authors emphasise that digital transformation is a continuous process. Hence, the changes must be set deep into the company culture so the organisation is ready to transition in the face of changes.

1.5 Scope of Outcome

This research aims to propose a framework to assist individuals and organisations looking to undertake large-scale technological changes to existing organisations. The differentiating factor for this framework is that it will be applicable to a global audience. Although the central focus of this research is on organisations, we feel that several audiences could find this research relevant. The outcome of this study could benefit entrepreneurs, management board

executives, change managers, consultants and researchers looking to delve deeper into generalised transformation frameworks.

1.6 Outline of the Thesis

Chapter one introduces the thesis topic. The background regarding digital transformation is presented with topics like the urgency, benefits, existing knowledge etc. Also, the research purpose, gap and questions will be raised.

Chapter two describes a detailed discussion about the theoretical framework and research methods relevant for this research. This chapter explains the terminology, theories, and description of the main topics. The topics presented in this chapter are: Industry 4.0, digital transformation in organisations, change management and meta-analysis.

Chapter three will dive into the methodology used for the research in this thesis. The research approach, design and methods will be discussed. Additionally, arguments and a discussion will be provided for the validity and reliability of the research.

Chapter four presents the collected data through case studies. Firstly, the criteria that the cases will be evaluated on are presented. After which, the results from the case study will be assessed. The primary focus would be on the similarities and differences in between cases. This will be substantiated using examples from the analysed cases.

Chapter five will look to build on the research goal of the thesis, i.e.- building a standardised digital transformation framework. Further arguments will be made in favour of the reliability and applicability of this framework in the real world. Lastly, we will discuss a tentative implementation proposal for this framework and discuss the expected benefits.

Chapter six concludes this thesis, wherein the authors discuss their key learnings while building the framework. Some more practical information will be shared around limitations and the future scope of research.

2. Literature Review

This chapter aims to give the reader an overview of the existing literature on digital transformation. Based on the literature study by the authors, the research done in this field is limited. This chapter covers topics like Industry 4.0, digital transformation in organisations, change management and meta-analysis.

2.1 Industry 4.0

2.1.1 Historical Overview





It is hard to pinpoint the start of the first Industrial Revolution accurately, but it can be attributed to the development and up-gradation of steam engines by James Watt in 1782. Watt's design of the steam engine saved a lot of fuel and power, making it viable for various industries. The initial developments were made to mechanise the textile industry efficiently, but the modern steam engine innovations made progress very accessible and ubiquitous (Deane, 1979).

Mokyr (1999) identified the increasing mining capabilities in continental Europe and America as a necessity that birthed the start of the Second Industrial Revolution. In 1856, Englishman Henry Bessemer patented the first inexpensive process to produce steel from pig iron. This sent connectivity infrastructure into overdrive, with railroads and bridges replacing horse-driven carriages. The Second Industrial Age is also renowned for birthing some of the greatest inventions for humanity, like the telephone, the incandescent light bulb, the alternating current and aeroplanes.

The Third Industrial Revolution marked a shift from analogue to digital technologies and an exponential increase in our networking capabilities. Gustini (2021) mentions several critical landmarks in 1969 which led to the development of the modern-day internet. This ushered in the era of globalisation. We are now embarking upon the next Industrial Revolution (also known as Industry 4.0), characterised by large scale Machine-to-Machine communication and the Internet of Things (IoT). The possibilities of billions of people connected by mobile

devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited (Schwab, 2016, p.1). An overview of the different revolutions is given in table 1.

Table 1. - The Four Industrial Revolutions (Based on Deane, 1979; Mokyr, 1999; Schwab, 2016; Gustini, 2021)

Revolution	Year	Information
	1784	Steam, water, mechanical production equipment
	1860	Division of labour, electricity, mass production
	1969	Electronics, IT, automated production
	2000	Cyber-physical systems

The reason we mention this information is to highlight the disruptive nature of technological innovation. Secondly, it also highlights that such disruptions are periodic in nature. The management must be perceptive of their business environment in order to remain aware of these changes. Organisations need to change their internal structure to ensure alertness towards such disruptions. The authors consider this a salient factor for organisational change.

2.1.2 Impact on Business

Before diving further into the literature, defining what we mean by “large-scale transformation” is essential. The term is not being used to describe large, multinational companies undergoing digital transformation. Instead, it discusses widespread technological changes that impact the organisation as a whole. To stay committed to this cause, the authors ensured variety in the evaluated case studies (for data collection and analysis).

There are two organisational aspects to digital transformation:

1. Developing new strategies, business models and organisational designs.
2. Executing the plans and getting from where the organisation currently is to where it aspires to be.

Designing new strategies superior to traditional forms is not easy, and implementing them in an organisation poses far greater challenges. Investment in new resources, particularly technologies and capabilities is invariably required. Resistance from different stakeholders is unavoidable, even from those who will ultimately benefit from the transformation. There are several risks of undertaking such massive changes and grave repercussions if things go wrong. Lastly, large-scale change is a lengthy process, and rewards often take a long time to materialise (Li, 2020).

The most salient feature of Industry 4.0 is the disruptive nature of large-scale technological changes. This causes the need for organisations to adapt quickly to changes and see digital transformation as a continuous process that should be included in daily activities. An organisation should not underestimate the disruptive nature of industry 4.0 and integrate the velocity of the large-scale technological changes in the structure of the organisation.

Schwab (2016) highlights four major areas where the Fourth Industrial Revolution impacts most businesses - customer expectations, product enhancement, collaborative innovation, and organisational forms. Increasing access to mobile networks and data has led to a corresponding increase in informational transparency, consumer engagement, and new customer behaviour patterns. This has resulted in a change in customer expectations and how they use products and/ or services. Another key trend of Industry 4.0 is the growing number of technology-based platforms that combine demand and supply. Coupled with the ease of use due to the widespread availability of smartphones, it has created entirely new ways of consuming goods and services. Physical products and services are bundled with digital technologies, enhancing their value for the customers. Other than adding value for the customers, these innovations have lowered the barriers to entry for new businesses and altered the conventional idea of a workplace.

2.2 Digital Transformation in Organisations

2.2.1 Digitisation and Digitalisation

The qualitative development of the nomenclature surrounding digital transformation has lagged behind the pace of technological changes. Researchers are furnishing new terminologies and theories every other day, and it is hard to keep up with all of it as a manager. Two key terms that have emerged in significance during this hubbub are *digitisation* and *digitalisation*. As seen in figure 1 below, both the terms spiked during the early 2000s, possibly due to the proliferation of personal computers. They took a dip due to what the authors predict as diminishing marginal utility. A resurgence could be seen from 2019 onwards due to the spread of COVID-19 and the imposition of lockdown restrictions.

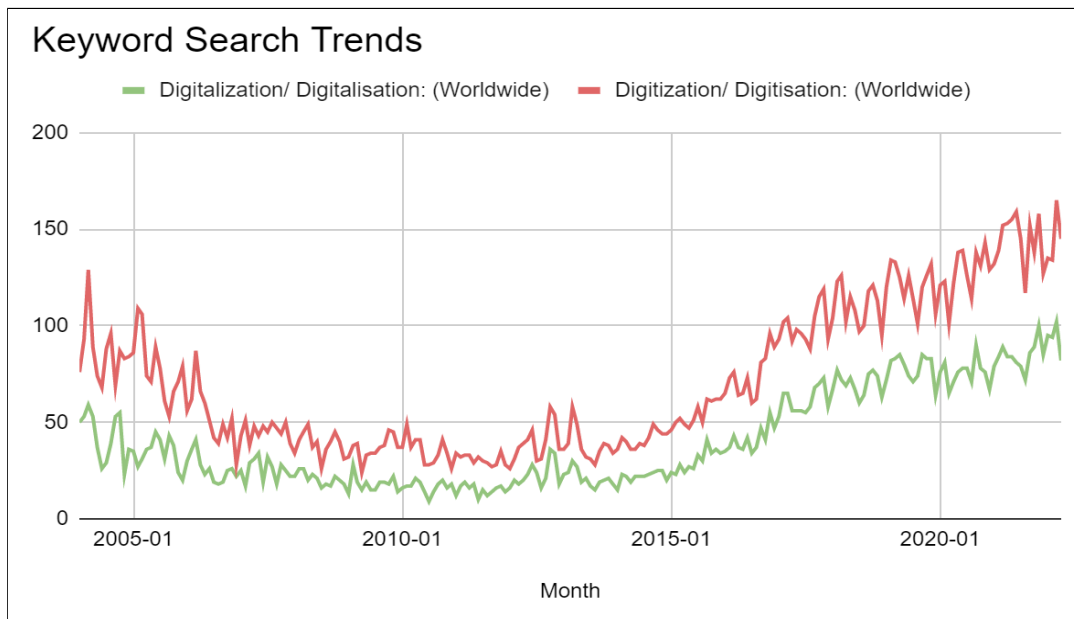


Figure 1. - Keyword trends for Digitisation and Digitalisation (Google Trends, 2022)

This ascertains one fact that there is an undercurrent of relevance to these terms in our personal and professional lives. These terms are often used interchangeably, but there is a difference in their respective meanings. Collins dictionary (2022) defines *digitisation* as turning information into a form that a computer can easily read. It can also mean converting a manual process into a digital one, like changing a paper form to an online version. The much-talked-about and ever-elusive “paperless office” is the pinnacle of digitisation (Gobble, 2018, p.2).

On the other hand, *digitalisation* means utilising the digitised data to work more simply and efficiently. In a business context, it can also mean using digital technologies to alter the status quo of processes and practices (Accenture, 2021). Digitalisation is not the irruption of a new revolution but the pervasive synergy of digital innovations in the whole economy and society (Perez, 2015). For instance, digitisation can mean installing sensors in a machine operating in a manufacturing plant. But the operator can utilise the data collected to check for machine efficiency. The floor manager can monitor the data flow to predict upcoming maintenance schedules. The operations manager can use the same information to calculate production capacities and plan the subsequent purchase orders. This is what digitalisation can offer to a business.

Even in the research community, there is discord among fellow researchers on whether digitalisation is focused on disruptive technology shaking up the current market or if it is an evolution of the existing technology. Austrian economist Joseph Schumpeter in his book “Capitalism, Socialism and Democracy” (1942), discusses in detail the role of innovation and entrepreneurship in creating change. He coined the phrase “creative destruction,” which he described as the “process of industrial mutation that continuously revolutionises the economic structure from within, incessantly destroying the old one, incessantly creating a new one” (1942, p. 82-83). He argued that constant innovation is the cornerstone of competitive strategy.

Perez (2002) conceptualised Schumpeter's findings to describe the principles of long cycles (or waves) of economic development. Figure 2 below illustrates the long waves and great surges of techno-economical development.

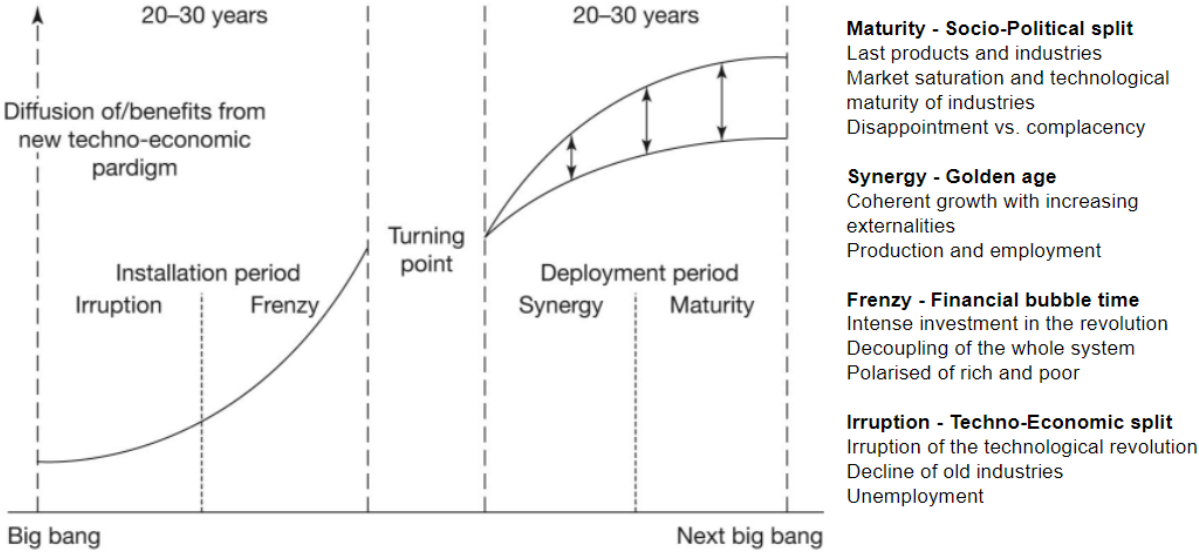


Figure 2. - Recurring phases of each great surge (adapted from Carlota Perez, 2002, p.48)

Valenduc and Vendramin (2017) define that the economy evolves in the longer run by successive techno-economic paradigms. A techno-economic paradigm begins with introducing new technology, resulting in structural changes in the organisation and society. The irruption of the new paradigm is noted by technological innovations forming innovation clusters, followed by a decline in old industries and the formation of new ones. After the initial frenzy of technological change, a turning point yields to the formation of financial bubbles and a massive inflow of investment. The frenetic investment phase can lead to economic crises once the bubble bursts.

This is followed by another turning point that leads to a phase of synergy called the ‘golden age’ of this paradigm. The adoption of the technology characterises this phase by several industries and services innovating in convergent directions, thus creating and distributing wealth between all stakeholders. Lastly, the fourth paradigm is the age of mass adoption, production and consumption. This eventually leads to market saturation and can also result in complacency (of suppliers) and/or disappointment (of demand generators).

In conclusion, digital transformation is a cyclical process of disruptive innovation followed by a long wave of implementation, adoption, and saturation. The model suggests that the next paradigm's irruption begins during the current one's maturity – like an ouroboros: a serpent or a dragon eating its tail. Similarly, digital transformation is akin to the cycle of life and death, continuously sustaining and destroying itself.

2.2.2 Moving towards Digital Transformation

“Not everything with a plug is technology”

~Founders Fund (2014)

This quote can be found on the website of the Founder’s Fund, a venture capital firm based in the United States. This phrase resonates with the authors because of the impressive portfolio of Founders Fund, both in terms of their board members (ex-founders of Napster, Facebook) and the companies they have invested in (AirBnB, Lyft, SpaceX etc.). Secondly, the authors believe that the true essence of digital transformation lies in not just building digital technologies and platforms. Digital transformation occurs when digital technologies are utilised to create large scale changes to the business models, processes, strategies, and mindsets of all the stakeholders (Founders Fund, 2014).

In the book “Strategic Digital Transformation”, written by Fenton, Fletcher & Griffiths (2019), three cases from the past are highlighted. Kodak, Nokia, and Blockbuster are discussed regarding their failure toward digital transformation. These cases offer insight into the value and purpose of digital transformation and why organisations should not wait to undertake digital transformation. In all three cases, the external factors and threats did not come as a sudden surprise, but these organisations all saw the threats coming for some time. The organisations primarily lacked one thing, namely, to observe the broader organisational culture and competing products and services that threatened them.

Fenton, Fletcher & Griffiths (2019) argue that these missteps could have been prevented by transformation is smoother and more efficient:

- Placing customers at the heart of the organisation
- Encouraging a happy and diverse workforce
- Constantly connecting with people outside the organisation
- Establishing a process to share trends/insights across teams and critically assess new technologies.

The main question for organisations remains the same: Why should we invest to undertake digital transformation?

In a research conducted by Fenton, Fletcher & Griffiths (2019), they interviewed professionals who were attending executive education programmes. The professionals were asked who benefits from digital transformation. The result can be seen in figure 3.

	Partners	Internal	External
Who	Partners Suppliers Industry Distributors	Staff Employees Environment	Consumers Clients Customers Agencies Public Authorities
How		Change Easier Efficiencies	Improve Experience

Figure 3. - Who benefits from digital transformation? (Fenton, Fletcher & Griffiths, 2019)

The main conclusions that can be drawn from this survey are that almost all stakeholders (internal and external) benefit from digital transformation in organisations. Implementing digital transformation can provide real-time insights that attract and motivate new customers. Digital transformation also boosts the internal and external communication in organisations. By undertaking digital transformation, new technologies are adapted and processes are streamlined. This causes a better flow of information and communication. Another benefit of adopting new technologies and streamlining processes that come with digital transformation is the possible level of automation. An example could be an automated email scanning system, which saves labour and money for organisations (Fenton, Fletcher & Griffiths, 2019).

2.3 Change Management

A part of digital transformation is changing and there are several types of changes that an organisation can make. According to Akingbola, Rogers & Baluch (2019), there are two main types of change. They describe first-order changes as incremental improvements to a small part of the organisation. First-order change components of organisations are undertaken while maintaining structural stability. Secondly, they talk about second-order changes which involve radical and discontinuous organisational change that makes comprehensive structural alterations (Akingbola, Rogers & Baluch, 2019). To place this in context, digitalisation is an example of first-order change. Digital transformation is a good example of second-order change (see figure 4).

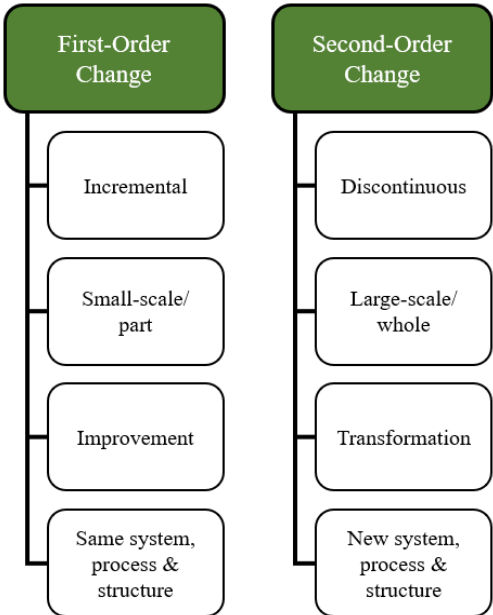


Figure 4. - First-order and second-order change (adapted from Akingbola, Rogers & Baluch, 2019, p.10)

While undergoing organisational change, Akingbola, Rogers & Baluch (2019) describe the difference between incremental and discontinuous change. When undergoing an incremental change, the organisations will keep moving by making (slight) adaptations without disrupting the overall system. When undergoing discontinuous change on the other hand, the organisations face more radical and all-encompassing, system-wide changes created to renew the core of organisations. This distinguishing can be seen between digitalisation and digital transformation, where the latter is characterised by a more radical and fundamental change within the organisation.

When undertaking digital transformation, both business and culture will be subject to change. Since both are transforming, we have hereby decided to highlight Kotter's (1995) change model and a model that describes the cultural change in organisations, as defined by Cameron & Quinn (2006). Using change models can reduce complexity and improve the efficiency of change in organisations (Galli, 2018). Galli (2018) also describes the importance of choosing a suitable change model and is optimistic about using models alongside each other depending on the topics or departments that require change. Schech-Storz (2013) agrees with Joseph Galli (2018) that different models should be used depending on the situation an organisation is in.

While Kotter's 8 steps of change focus on the whole organisation, Cameron and Quinn's 9 steps for cultural change highlight the people part of the change in an organisation. They argue that in order to get any change started, cultural change should be considered first. In order to come up with a generalised framework at the end of this paper, an understanding of how other people suggest undertaking change can be helpful.

2.3.1 Cameron and Quinn's 9 steps for Cultural Change

Cameron & Quinn (2006) came up with a model for cultural change. Similar to Kotter's model, this model is developed to help organisations undertake cultural change. To undergo this change, Cameron & Quinn (2006) came up with nine steps, as shown in figure 5.

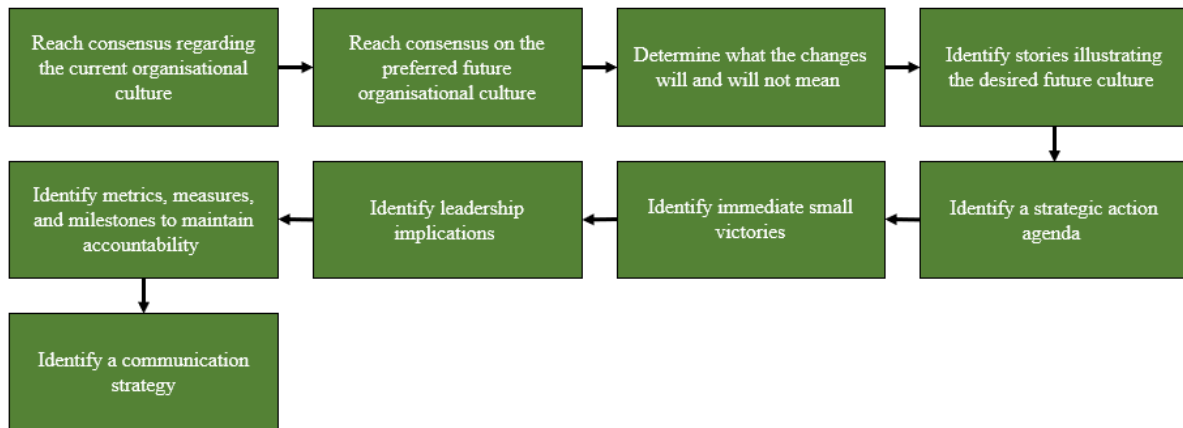


Figure 5. - Cameron and Quinn's 9 steps for cultural change (adapted from Cameron & Quinn, 2006)

2.3.2 Kotter's 8 steps of change

Kotter introduced his model for change in 1995, better known as Kotter's change model (Kotter, 1995). Kotter is convinced that leadership and/or management should create and sustain changes to compete in the competitive world we live in. Kotter is slightly different compared to other change models like The McKinsey 7-S Model (Singh, 2013) by having the last step of the process purely focusing on the culture. Kotter's change model includes leadership, communication, support, trust and involvement. Kotter experienced the mistakes made by organisations when going through a transformation. Based on this, he came up with a model that consists of eight consecutive steps (see figure 6).



Figure 6. - John Kotter's 8 steps of change model (adapted from Kotter, 1995)

2.4 Chapter summary

In the current world, digital transformation is becoming more and more critical. Digital transformation is closely related to industry 4.0 and focuses on modernising current organisations to prepare for the future and enable sustainable growth. Next, this chapter shows the importance of digital transformation for organisations. According to the literature, digital transformation can be beneficial for companies, but it also shows the importance of a suitable transformation process. This is where change management comes into play to ease the transitions and handle resistance to change. There are multiple reliable models available these days and it is debatable which of these are the most successful. In order to analyse as many cases as possible within a short period of time, a meta-analysis will be carried out. The process of a meta-analysis is described in this chapter. In table 2, an overview of the most important topics can be found.

Table 2. - Literature summary

Topic	Summary
Industry 4.0	Industry 4.0 is the fourth industrial revolution and focuses on the quick change in technology due to increased interconnectivity. This impacts businesses directly and indirectly with things like intellectual property sharing.
Digital transformation in Organisations	Organisations often ask themselves why they should undertake digital transformation, and the challenges and steps that come with this transformation are described. Also, the impact on the business is defined as what could happen if organisations choose not to undergo digital transformation.
Change Management	A big part of this transformation is the change process when undergoing digital transformation. The importance of change management and its potential benefits are described in this chapter.

3. Method

This chapter will present the research approach, research design, methods of data collection, methods of data analysis and finally the validity, reliability and ethics of the chosen methods.

3.1 Research approach

The approach to this research can be defined as inductive. As defined by Sekaran & Bougie (2016), while doing inductive research, one looks at specific circumstances in order to derive general conclusions. To explain it within the scope of our research, individual data from cases will be collected, categorised, and generalised into conclusions. When applying an inductive approach, any conclusions generated from the research cannot be proven to be true. This is because there could always be an unknown future or case. Even though no conclusions can be proven, inductive research is seen as one of the most essential parts of the research process (Sekaran & Bougie, 2016; Prince & Felder, 2006). While conducting this research, there was a focus towards finding a solution for a business problem, to get this solution, a pragmatic and applied research solution was created.

3.2 Research design and data analysis

We have designed this research to be a meta-analytic study. A meta-analysis is a method used to combine qualitative and quantitative data from multiple studies or cases to develop a conclusion that has a bigger power than using individual analysis. Due to a higher amount of diversity, effects, and subjects, using a meta-analysis can increase power in research. Meta-analysis can increase statistical significance, create better forecasts and effects, get a more complex analysis of benefits, examine subcategories, and get an interconnection between them (Himmelfarb Health Sciences Library, 2022). A meta-analysis study consists of seven phases, as can be seen in figure 7.

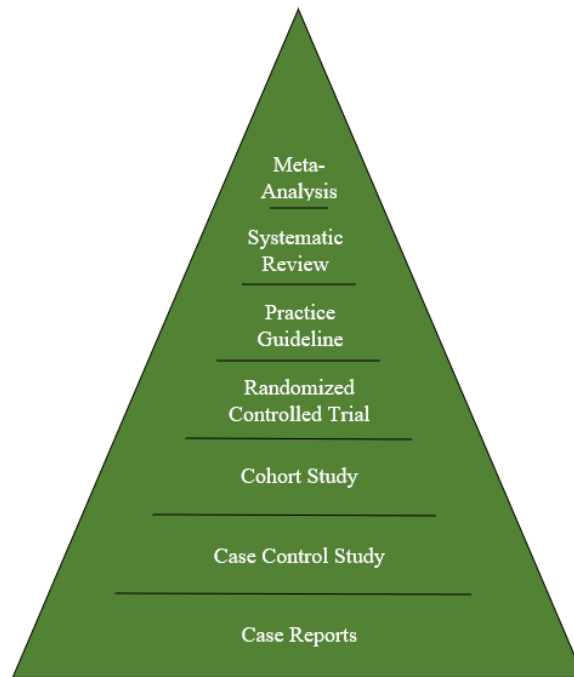


Figure 7. - Overview of a meta-analysis study (adapted from Himmelfarb Health Sciences Library, 2022)

Gene Glass introduced the term meta-analysis in 1976 as "the analysis of analyses" (p. 3). Glass (1976) used it to analyse an extensive collection of results from other separate, individual analyses and studies to collaborate and corroborate the outcomes. We have designed a retrospective analysis for evaluating the relevant case materials. Since our study involved identifying the commonalities in the digital transformation journeys of a heterogeneous group of companies, we feel that a meta-analysis of the collected material is warranted.

We opted for a meta-analysis instead of interviews/surveys or a combination of both due to three major reasons -

1. We are focusing on an organisation-wide digital transformation process. If interviews were to be conducted, they would most likely offer insights about a particular business unit of the interview. The senior management or the company board could shed more light on this subject, but these people usually have quite busy schedules and are hard to get a hold of.
2. Digital transformation is a time-consuming process. It is likely that the tenure of the executive being interviewed does not match the entire timeline for a large-scale transformation.
3. Lastly, this research has been conducted in a short span of 10 weeks. We realised that a combination of surveys/interviews and a meta-analysis would be too time-consuming.

The base of a meta-analysis starts with *case reports*, which are said to have the lowest level of evidence. A case report ideally consists of clear and detailed information. Secondly, a *case-control study* is carried out, which compares the case reports to see how individual cases relate to each other. After analysing that, a *cohort study* can be carried out. During a cohort study it is determined whether there are similar causes to an occurrence or challenge. The next step in meta-analysis is a *randomised controlled trial* (RCT). In this, the variability of the study is observed to identify the cause and effects of the different cohorts identified in the previous step. Based on the RCT, *practice guidelines* can be created. These can be considered as the best practices for the intended outcome of the experiment. In order to check whether the guidelines are correct and valuable, a *systematic review* is conducted. The review is designed to test the findings from all the previous steps against available literature (or data). While reviewing, both published and unpublished data are assessed and summarised in a general findings section (Himmelfarb Health Sciences Library, 2022; Hedges, 1992).

3.3 Conducting the meta-analysis

3.3.1 Case Reports

We started off by identifying the appropriate search strings that would fetch the literature relevant to this study. Right from the onset, the primary focus was on digital transformation journeys of an industry or a technological advancement led by an organisation that had a widespread impact on all stakeholders and the industry in general. Table 3 highlights some of the salient search terms which were used. We employed several combinations of these strings and Boolean operators in the advanced search section of Google Scholar and Google search engine.

Table 3. - Overview of Search Strings

Key Focus	Boolean Operator	Adjunct	Industry (not specific to every search)
Digital Transformation Digitalisation Digitisation Meta-analysis Change management Industry 4.0 Feedback Mechanism Strategy Operations Change Management	“AND” “OR” Quotation Marks (“ ”)	Impact Roadmap Challenges Journey Competitive Advantage Effect Failures	Banking Finance Agriculture Automotive Economy Retail Pharmaceutical Consumer Electronics

As mentioned in chapter 1, the search strings are intentionally kept diverse so that the end result of the meta-analysis can be concluded to be generalisable and applicable to any company or industry. Even though the authors understand that identifying clear trends in such a case would be a painstaking process, it is considered essential in order to answer the research questions satisfactorily.

3.3.2 Case Control Study

Traditionally, a case-control study is conducted in medical domains to identify the external and internal causes for a specific disease in a group of patients. This method of analysis is analogous to the current research. Since the end result is to develop a generalised framework for digital transformation, the authors wanted to evaluate and identify the motivations, processes, challenges, and results of transformation journeys as experienced by organisations or industries. Hence, a decision was made to perform a similar study on all the cases that were shortlisted based on the search criteria.

Moving on, the authors subjected all the searched literature to a case control study. At the beginning of the research the industry filters were kept quite open, hence it was vital to identify underlying trends and patterns in the transformation journeys as experienced in different cases. This helped in understanding the control parameters needed to establish in order to isolate the relevant cases for the research purpose and also supplement the upcoming

cohort study. Based on our inferences, the following control parameters were identified (see table 4).

Table 4. - Control Parameters for Case Studies

Parameters	Brief Description
Timeline	The authors want the material to be recent and relevant to the current changes as seen in Industry 4.0. Hence, the authors focussed on articles published after 2010.
Motivation	The authors focus on the trigger points that motivated organisations to drive change, e.g.- economic sustainability, competitive advantage, decreasing market share, technological breakthrough.
Process	The authors deep dive into the digital transformation journeys of the organisations, further evaluating the goals, trajectories, and desired outcomes.
Outcomes	The authors focussed solely on organisation/industry wide digital transformation. Digitisation of databases and partial digitalisation of an organisation were deemed unfit for the study.
Change Management	The authors studied the challenges and roadblocks that may occur during digital transformation. It could be people resisting change or the technological challenges that come with the large-scale transformation.

3.3.3 Cohort Study

A cohort study is a research method that involves repeated observations of the same variables of a fixed sample or a cohort. The cohorts were determined based on the aforementioned control parameters. This helped us segregate the relevant literature. Furthermore, the objective of the cohort study was to gauge the extent and nature of the relationship between the control parameters and the overall digital transformation journey of the organisations.

Since the expected outcome of this research is a framework for digital transformation, we focussed majorly on identifying trends and similarities between the transformation journeys as presented in the different case studies. Taking inspirations from Kotter’s 8 Steps of Change (1995) and the transformation frameworks provided by consulting companies (PwC, 2021; Gartner, 2022; Mckinsey, 2011; Capgemini, 2011), the authors were able to isolate some key criteria that are evident and essential for a large scale digital transformation project.

- Trigger Points - Analysis of internal opportunities and external threats motivating management to undertake digital transformation change.
- Strategic Initiatives - Analysis of top-down decision making processes and evaluating the strategy planning and implementation process.
- Planning, Delegation and Execution - Once the broad level strategy has been finalised, the next step is to allocate responsibilities to various departments and personnel. A large-scale transformation can not be successful with only the efforts of the top management, but by sharing the responsibility.
- Training and Change Management - Any large scale transformation will not be successful if the people impacted by it are not onboard. Especially, in the case of digital transformation it is important to account for training and implementation of the new technology. The authors observed instances where the transformation plans failed due to resistance from employees and lack of change management principles.
- Challenges and Roadblocks - Any transformation journey comes with its own set of challenges. In an ideal world, the organisation would be able to anticipate the upcoming challenges. For practical purposes, an organisation should keep a margin of time to address, mitigate and solve any roadblocks that show up during the transformation journey.
- Evaluation and Feedback - No process is complete without having a feedback loop that can be used to feed information to fine-tune the transformation process. All organisations that were successful in their digital transformations initiatives had a steady feedback loop and they used their learnings to evaluate and rework their strategy.
- Impact Assessment - Evaluating the outcome of digital transformation and assessing its impact on the organisation's macro-environment (like culture, economy, market position etc.). It is important to set milestones for the entire process and assess the achievement or failure to cross that said milestone.

The reason for selecting these criteria as well as their detailed description will follow in the subsequent sections.

All the selected cases will be analysed using the aforementioned cohorts. The relevant findings will be recorded in tables (section 8.1). The summarised insights will then be used to

feed into building the framework. We argue that doing so will form a comprehensive and exhaustive platform to analyse the different case studies and help narrow down the seemingly wide nature of industries and organisations.

The literature was still quite wide in scope because of the variance in the industries involved. We hope to achieve a certain degree of standardisation and homogenisation of the collected information, which could eventually be utilised to develop the generalised framework for digital transformation. The results gathered from the cohort study (and the subsequent studies) are discussed in detail in the Theory Section.

3.3.4 Randomised Control Trial

A randomised controlled trial (RCT) is an experiment to determine the impact of an intervention in a random group and compare the results against a control group (not receiving said intervention) of a similarly eligible population. (White, Sabarwal & Hoop, 2014). Due to the academic nature of the research and the lack of human participants we had to modify the method of conducting an RCT for the research literature.

Since the method of meta-analysis has been adapted from medical research, there are certain steps which are not analogous to be applied on organisations. We encountered a similar roadblock during the Randomised Control Trials. The intervention in the context of this research is “digital transformation”. In an ideal environment, trials could be conducted wherein some organisations are offered the intervention (random group), while the others are not (control group). The outcome of two groups could then be further evaluated to assess the impact of the intervention (digital transformation).

We determined that this is well beyond the scope of this research due to the below mentioned reasons -

1. Since we could not identify an existing framework that encompasses a large-scale digital transformation, there was no intervention readily available for us to conduct an RCT.
2. Finding organisations to volunteer as a test candidate is an extremely ambitious and unrealistic task. We believe that hardly any management would be willing to implement an untested digital transformation framework.

Future researchers can use the findings of this study to conduct a similar organisational meta-analysis which includes RCTs. In order to remain true to the selected research method,

we split our organisational cases into *successful* and *unsuccessful*, and studied them against the cohorts identified in the prior section.

3.3.5 Practice Guidelines

The next few steps are aimed towards building a standardised hypothesis of the best recommended practices based on the research and analysis conducted so far. This is vital for the intended result of the research, i.e.- a general framework for digital transformation.

In theory, practice guidelines are the statements produced by a panel of experts after extensive evaluation of the inferences gathered from the controlled studies in the previous steps (Himmelfarb Health Sciences Library, 2022; Hedges, 1992). Within the scope of this research, the authors consider themselves to be the experts of digital transformation in organisations, while being moderated by the supervisor. Hence, the authors systematically reviewed the similarities and differences as experienced by different organisations in their respective digital transformation journeys.

While reviewing the case studies we tried to find information relevant to the control parameters and the cohorts to build the guidelines. During initial research we realised that the macro-parameters of a digital transformation journey are quite homogenous irrespective of the industry or the organisation being studied. The attempt was to gain a peripheral perspective of the transformation trajectories and identify key trends between the wide variety of industries and organisations that were a part of the literature.

3.3.6 Systematic Review

A systematic review is a process of reviewing, combining, and documenting all the information from all available studies (focusing on digital transformation journeys of similar cases) and then summarising the findings. As discussed in the previous section, the authors consider themselves experts on this subject within the scope of this study, thereby granting authority to perform a systematic review for this research.

While conducting a literature review and research, we found several digital transformation frameworks that are employed by major consulting firms (PwC, 2021; Gartner, 2022; McKinsey, 2011; Capgemini, 2011) for their clients. The limitations of these frameworks have already been discussed in Section 1.2. Nevertheless, the authors appreciate the reliability and

veracity of these sources, and find it instrumental to juxtapose their research findings parallel to the existing frameworks. This helps in further validating this study.

The guidelines were utilised to validate the research findings against available information. This step helped trim out noisy observations and build a lean framework for easy replicability.

3.3.7 Meta-analysis

Upon conducting rigorous and iterative analysis of all relevant research literature, several similarities and trends appeared in the multiple different digital transformation cases. To reiterate the quote by Gene Glass (1976), the authors conducted an “analysis of all the prior analyses” to help furnish information for building the generalised framework for digital transformation. The findings from all these analyses and their utilisation into building the results are discussed in more detail in the theory section (section 4.2).

Based on the initial research, we identified some key points that would be the primary focus while analysing the case studies. These key points were determined based on their relevance and probability of occurrence in the digital transformation cases. While conducting the meta-analysis we discovered that most of the literature confirmed the initial hypothesis. The finding of evidence in the case studies sufficiently proves the veracity of the experiment parameters or key points. The key points are further described in the next section.

3.4 Data collection method

In this section, the chosen method for collecting primary and secondary data will be presented.

3.4.1 Pre-Study

Before the start of this research, a short pre-study was carried out. The authors brainstormed with each other about what topic to write on. The authors also watched some relevant video material and spoke to the teaching staff at Lund University School of Economics and Management about digital transformation and their knowledge of this topic. One of the authors also went back to his previous employer to learn about digital transformation and businesses in general. The result of this pre-study was to get the first insight around digital

transformation. Aside from this first impression, the authors also observed a gap in roadmaps or frameworks for industries/organisations that face structural or financial challenges while undergoing digital transformation.

3.4.2 Data Gathering

In order to gather the desired data for the meta-analysis, literature research was carried out by the two authors. In order to get a complete case study or organisations that underwent digital transformation the authors came up with a checklist to see whether the case study is complete enough to be used as an example. In table 5, an overview of the desired topics needed for the research is presented.

Table 5. - Overview of Topics Needed for Research

Topics	Explanation
Trigger points	Trigger points can be seen as a stimulus for organisations to start digital transformation. Examples could be economic sustainability, competitive advantage, technological breakthrough, or decreasing market share. These trigger points can be used for organisations to create an urgency to undergo digital transformation.
Opportunities	The trigger points defined by organisations can be seen as opportunities for the business to grow. For example, if market share decreases due to competition, an opportunity could be to find new business areas to maintain market share and sustain economic stability.
Change process	During the process of digital transformation, organisations have some kind of change process involved. The authors were looking for this kind of process and how individual organisations or case studies underwent this process. Ideally, this process consists of clear headlines with a step-to-step approach while explaining each individual step.
Challenges	In the process of undergoing digital transformation, most organisations face some challenges along the way. Whether these are financial, cultural or organisational challenges, the authors are looking for these challenges and how the organisations took care of these in the end.
Evaluation and Feedback	Touching upon challenges, the authors looked for explicit learning points that the organisations faced during digital transformation. These learnings could be used in the framework to build a feedback

	mechanism and prevent future organisations from facing the same mistakes.
Impact on culture	An important factor during digital transformation is the cultural aspect. The authors are looking for the impact of digital transformation on the culture of organisations and how employees cope with the change.

3.5 Validity and Reliability

There are several aspects to consider among the topics of validity and reliability. First of all the data gathering and selecting the cases that were found to be relevant. Secondly, the analysis that came with this research is a vital part and therefore it is important to consider the validity and reliability. An important aspect to remember is the diversity of cases that are being studied during this research. This makes the sample size quite unique, thereby making it hard to replicate and observe similarities. We decided to carry out a meta-analysis that focuses on analysing several cases or examples and drawing generalised conclusions to increase reliability. Also, before starting analysis or the search for cases or examples, we created a general understanding of the criteria to ensure a more reliable and valid search process. Not only the search strings and areas were determined, the search criteria was also discussed and established.

Secondly, for the validity and reliability of the thesis, the authors established guidelines with the supervisor in order to keep a direct communication with the supervisor and notice when something was wrong at an early stage. From the beginning, the authors and the supervisor had a good relationship. They agreed that whenever the authors finalised a (sub)chapter, they would have it checked by the supervisor. In order to not be surprised in the end about the results and increase validity and reliability of the overall research.

In qualitative research, the validity relates to how the process/data of the research are aligned (Leung, 2015). In order to ensure validity, it is important to use a methodology to make sure the right conclusions are drawn (Saunders, Lewis & Thornhill, 2016). In order to keep the randomness of collecting data, the two researchers both researched each subject to ensure randomness and increase validity and reliability among the literature. Next to the validity of a research, reliability is seen whether or not other researchers undertaking the same research would come to the same conclusions (Ali & Yusof, 2011). Even though the researchers made the conclusions reasonable and logically sound, a certain extent of variance for this research had to be accepted due to the nature of the research type (Leung, 2015).

3.6 Limitations

Like all research studies, this study has its own limitations. The study results are based on multiple case studies that are all unique in their own way. Further research, including more organisations or different industries, could increase the generalisability of the research. Next, we had limited time to conduct this research since the graduation date of our master programme was around the corner. The research could have been more accurate or with a broader result base if there had been more time. Therefore, further research can be done to support the findings or extend the scope of the research. The result of this study may be limited to organisations with the same characteristics as the studies organisations.

3.7 Chapter summary

In order to answer the research questions, this research used a meta-analysis and pragmatic research approach. The research design consists of a meta-analysis. In this meta-analysis, smaller steps will be taken during the process of conducting this research. This research can be divided into mainly two parts: a literature review and a continuous case study of existing cases regarding digital transformation. The cases were selected and analysed according to set criteria by the authors. The data collection process is discussed and the topics the authors were looking for were determined. Lastly the validity and reliability of the research was discussed and mentioned.

4. Data Analysis

The following section will highlight the salient methods for our analysis and debate the merits and limitations of the selected research methods. As discussed earlier, the research is designed as a meta-study on the retrospective analysis of various digital transformation case studies. In the following sections, we will discuss in more detail the analysis methods.

4.1 The Analysis Criteria

We conducted a meta-analysis using case studies of digital transformation journeys from several organisations. The cases considered for this study were specifically kept to be quite diverse in terms of industry and scale of the organisation to ensure that the final framework is generalisable for all types of organisations. Analysing such cases is a daunting task as there are several endemic differences in the case literature due to the varied nature of the industries. We argue that the challenges posed by the initial ambiguity will pave the way for a comprehensive umbrella framework that would be widely applicable. Moreover, we made sure to include literature from both successful and failed transformation cases to understand both the wins and losses of large-scale change.

During the initial stages of research, we identified some repeating trends in all digital transformation cases. These trends are discussed in more detail in the subsequent sections (section 4.2) and were extensively used to build the final framework.

The following table (table 6) provides a short overview of the cases that we have evaluated for this study, along with their respective industries, summaries and case authors.

Table 6. - Overview of analysed cases

No.	Organisations	Industry	Case Summary	Reference
1	Springfield Council [1]	Legislative branch of government	Building technological platforms for local residents.	(Stark, 2020)
2	Springfield State University [2]	Higher education	Reworking their strategy to better cater to their customers (students).	(Stark, 2020)
3	Nokia [3]	Telecom, Consumer electronics	Failure to adapt to new innovations in technology.	(Insead Knowledge, 2017)
4	Kodak [4]	Film camera	Lack of foresight to adapt existing product lines.	(Anthony, 2016; Mui, 2012)
5	Springfield County Regional Bank [5]	Banking	Iterative process to become more digital and accessible to customers.	(Stark, 2020)
6	LEGO [6]	Consumer Goods (Toys)	Using digital transformation to become more agile and improve financial performance.	(Andersen & Ross, 2016)
7	IKEA [7]	Furniture retailer	Implementing digital technology along with existing company philosophy to become accessible to more customers.	(Hagberg & Jonsson, 2022)
8	HIROTEC [8]	Automotive original equipment manufacturer	Using IoT sensors to monitor maintenance needs and predict breakdowns before failures.	(Ezell et al. 2018)
9	Al-Rumman Pharma [9]	Pharmaceutical	Strategic overhaul of the organisation to focus on digital technologies.	(Faridi & Malik, 2020)
10	Target [10]	Retail store	Internalising e-commerce service	(Harvard Business School Digital

			from the current method of outsourcing it to Amazon.	Initiative, 2018)
11	Kaeser Kompressoren [11]	Compressed air systems	Using IoT sensors to predict customer demand and branch out to add a leasing option.	(Ezell et al. 2018)
12	Zavarovalnica Triglav [12]	Insurance	Building internal technologies to better prepare for the anticipated wave of digitalisation in the industry.	(Erjavec et al. 2018)
13	Danish Public Services [13]	Public services	Long term digitalisation projects to provide comfortable services to all residents.	(Scupola, 2019)
14	Hummel [14]	Sports apparel	Collating multiple partner websites selling their products to align to Hummel brand sensibilities.	(Hansen & Sia, 2018)
15	Haier [15]	Electronics	Implementing "intelligent manufacturing" to incorporate customer demands in planning and production.	(Li & Yang, 2021)
16	Haribo [16]	Confectionary	Failed ERP implementation due to lack of planning and feedback.	(Baumann, 2021)

4.2 Similarities and differences

After having conducted this case study, we focused on analysing the similarities and differences in the cases. These findings will be described in the following sections.

4.2.1 Trigger Points

We observed in all the cases that there is some kind of an initial trigger that initiates the transformation. It creates a need to transform, forcing organisations to better understand the urgency of change. By having a clear motivation, people can set goals and plan for a successful transformation. Hence, the management of organisations must be on the lookout for such triggers for change. We observed that most of these trigger points can be categorised into pricing, customer experience, technological development or improving efficiency.

Some organisations see cost cutting as a trigger to undertake digital transformation, as can be seen in the cases of Springfield Council [\[1\]](#) (Stark, 2020) and Target [\[10\]](#) (HBS Digital Initiative, 2018). Springfield Council [\[1\]](#) decided to undergo digital transformation to reduce administrative and operating costs. Similarly, Target [\[10\]](#) stopped their collaboration with Amazon and undertook large-scale transformation to establish an internal fulfilment department. This enabled them to lead their own e-commerce business and increase margins. Both of these organisations took a different approach, but were looking to reduce costs.

Secondly, digital transformation can be used to enhance the customer experience. An example of this was elucidated by Stark (2020) in the case of Springfield County Regional Bank [\[5\]](#) (SCRB). They concluded that their existing systems and protocols were outdated and not suitable enough for the current world. Their process to open a bank account consisted of too many manual actions and a long waiting time. They were also lacking behind the competitors when it came to online banking and user experience. Kaeser Kompressoren [\[11\]](#) (Ezell et al. 2018) improved their user experience after installing IoT sensors in all of their compressors. After installing the sensors, they could predict the downtime of their compressors and predict customer demand. Simultaneously, they were able to offer a leasing structure of their equipment to the customers. Both these initiatives helped the customers cut down operating expenses, thereby improving their experience.

Another kind of trigger is the introduction of new technology or drastic improvements in existing ones. Once such a change occurs in the industry, it is time to undertake digital transformation towards the modern system to sustain economic stability. As seen in the case

of Kodak ^[4] (Anthony, 2016; Mui, 2012), they were the leaders in the photo and film industry for years. Due to the development in digital technologies, customers started preferring digital cameras over the traditional Kodak ^[4] cameras. Kodak ^[4] ignored this technological development and did not transform their business to be suitable for this transition. As a result, Kodak ^[4] had to declare bankruptcy, further highlighting that ignoring technological development is a fool's errand.

Lastly, digital transformation can be used to increase process efficiency. Both HIROTEC ^[8] and Kaeser Kompressoren ^[11] (Ezell et al. 2018) focused on installing sensors in their existing products to predict and reduce downtime. This helped them save massive costs due to breakdown, therefore improving the efficiency of their process. The same could be seen in the case of Hummel ^[14] (Hansen & Sia, 2018) when they attempted to reorganise their e-commerce presence. Before their transformation project, they observed that their distributors had listed their products without following any brand sensibilities and guidelines. Often this meant that their customers were uncertain and unsure whether they were getting the right product. Hummel realised that this is detrimental to their brand image. Upon concluding their digital transformation, they not only solved the cataloguing concern for their brand, but also increased their e-commerce business more streamlined.

4.2.2 Strategic Initiatives

Once the organisation has identified the need to transform, it is usually followed by the management outlining plans to undertake digital transformation. These are broad level, top-down initiatives that lays down a path for the organisation to follow. Depending on the company, urgency, complexity etc., organisations differ in these initiatives. It is important to be comprehensive and far-sighted in making these strategic decisions. Myopic strategic initiatives can lead to misalignment across the business and often result in massive losses.

At Kodak ^[4] (Anthony, 2016; Mui, 2012) the management team ignored a change in customer demand from conventional to digital cameras. Kodak ^[4] at the time, was the pioneer in digital cameras but decided to ignore the change and focus on their more traditional cameras. The reason behind this stubbornness was because their profitability mainly came from the film department. On the other hand, their camera department was hardly profitable. The decision to ignore the growing demand of digital cameras can be seen as lack of foresight in strategic planning, resulting in bankruptcy at the end.

Making strategies based on a realistic and comprehensive analysis, immediately creates a structure and vision for the organisation. An example of good strategic initiatives can be seen

with the digital transformation of the Danish Public Services [\[13\]](#) (Scupola, 2019). They were careful about the changes happening in the digital society. Instead of sticking to a single strategy for the next ten years, they revisited and adapted every few years. In 2016, the Danish government launched the strategy “A stronger and more secure digital Denmark - Digital Strategy 2016-2020”, which focused on user-friendliness, growth and security. A strategy like this is hands-on, has the ability to adapt to changes and has a clear goal.

We argue that large-scale transformation is led from the top. It is the responsibility of the management or the board to observe and react to the triggers that they see in their business environment. Company strategy must be adapted according to the changing business landscape. A failure to do so can cause several short and long-term losses for the organisation.

4.2.3 Planning, Delegation and Execution

Once the top management has decided the broad-level steps and the transformation goals, it is vital to openly communicate the same with all the employees. It is important to get all employees involved and committed to the end goal in sight, otherwise, the transformation initiative stands the risk of falling apart. While a strategy provides an end goal which the organisation strives to achieve, there needs to be an execution plan built around it. To initiate ground-level changes, it is advisable to incorporate the subjective expertise of all employees. The evidence for this can be found in the case of Haribo [\[16\]](#) (Baumann, 2021) and their failed ERP implementation. When experts retrospectively analysed the causes for failure, they realised that the implementation strategy clearly lacked foresight to conduct rigorous β -testing. They also commented that the plans were overly ambitious. It is quite evident that the management at Haribo [\[16\]](#) (Baumann, 2021) did not establish an internal support base (consisting employees as stakeholders) who would assist the organisation in a seamless transition.

Even though large scale transformation must be driven from the top, the cumulative efforts of all the stakeholders are essential for it to be successful. Clear and open communication of management strategies brings people onboard and makes them a part of the change. This is well illustrated in the case of Hummel [\[14\]](#) (Hansen & Sia, 2018). The company considered itself as a bulk supplier and was heavily reliant on their business-to-business (B2B) partners to reach its end customers. Hence, when they started off on their transformation journey, they ensured that the B2B partners were kept in the loop of the entire process. Despite multiple suggestions to grow its business-to-consumer (B2C) channel, Hummel [\[14\]](#) resisted direct selling to end customers, lest they displease their B2B partners. In the end, the result was synergistic growth of both the brand as well their partners.

A large-scale transformation is an ambitious project and definitely benefits from multiple perspectives. Hence, it is vital to involve employees from every department or function in the transformation process. Any ambitions to transform will fall flat if the people in the organisation feel alienated from the change process. Digitalisation can not be successfully attempted as an isolated activity by one or more functions of an organisation. The success of Springfield State University's ^[2] (SSU) (Stark, 2020) transformation initiatives can be attributed to the fact that they included their stakeholders in the process. They identified several faculty members and students as “change agents” and offered them training about the upcoming changes. Simultaneously, the University also developed a communication program, like workshops, a project blog, intranet updates, poster displays, town hall meetings, lunch-and-learn sessions, and after-works. They considered it was important to explain the need to transform and how they are going to achieve their goals.

Similar to SSU ^[2], the case for Zavarovalnica Triglav ^[12] (Erjavec et al. 2018) argues in favour of an integrated approach combining all processes, products and services. Zavarovalnica Triglav ^[12] mixed employees from different teams (products, processes and IT) to avoid building functional silos. All these instances elucidate the need to clearly communicate the strategy to all employees in an organisation and actively involve them in the transformation process.

4.2.4 Training and Change Management

Attempting a large-scale digital transformation is an ambitious project which requires commitment from all members of an organisation. It is a massive and permanent change in products, processes and the way people do business. Unfortunately, such initiatives are catenated with a resistance to change. Especially in the case of digital technology, people have concerns about data privacy and whether automation will take away their jobs. Successfully addressing such problems requires training and change management initiatives. We saw different types of training and change management methods employed by organisations to counter this, both successfully and otherwise.

For example, IKEA ^[7] (Hagberg & Jonsson, 2022) started off their transformation journey, by splitting it in three consecutive steps. First of all, they visualised what their change could look like when completed. Secondly, they mapped out what functions, areas and parts of the business model are involved in the change. Lastly, they emphasised on evaluating the change after implementation. They received the feedback from all of the IKEA locations and transferred them internally within the organisation. This iterative method of managing transformation was one of the building blocks of their success.

Kotter in his model for change (1995) prescribed the need to create a vision of the final destination and communicate the same to the people in the organisation. It is quite analogous to how IKEA [\[7\]](#) instigated their digital transformation. Kotter (1995) also recommends forming a strong coalition of multi-disciplinary employees who would lead the change in the organisation. IKEA [\[7\]](#) executed upon this principle by identifying certain stores that would run the β -tests for the new strategies before communicating the results to the top management. This ensured a robust feedback network for IKEA [\[7\]](#) and also correlated to Kotter's (1995) idea of institutionalising the change. Using this method for change management paid off for IKEA [\[7\]](#) with their e-commerce revenue increasing by almost 800% in 6 years (Hagberg & Jonsson, 2022).

When Haribo [\[16\]](#) (Baumann, 2021) undertook digital transformation to streamline their production processes, they showed a lack of leadership in the change process. Their goal was to increase their international manufacturing presence. After the implementation of the new ERP system, they found out that this system was not capable of delivering that goal. When they analysed this mistake, they concluded that the executives did not define the organisational goals and vision in consideration before starting the transformation process. As Kotter (1995) describes in his model for change management, an organisation should always start with creating some kind of vision for the change. Haribo [\[16\]](#) clearly did not create a vision resulting in a lack of required information before choosing the technology involved in the change. The transition from an outdated system built in the 1980s to a new ERP system required a robust implementation and testing plan. Clearly, there was not much thought spent on these aspects of transformation. Secondly, Haribo [\[16\]](#) was a stark failure where (IKEA Hagberg & Jonsson, 2022) succeeded. Due to a lack of communication, they did not have enough executives onboard their transformation strategy. In the end, this led to a lack of support base across the organisation.

Since the research is focussed on digital technologies, there is another facet to change management that needs to be considered here. The stakeholders who are being impacted by the change initiatives must be offered sufficient training to become well-versed with the new technologies. Both the Springfield Council [\[1\]](#) and the Springfield County Regional Bank [\[5\]](#) (Stark, 2020), also experienced resistance to change. People were sceptical about losing their jobs to new technologies. However, we concluded that digital transformation creates different jobs while not necessarily removing existing jobs. The Springfield County Regional Bank [\[5\]](#) observed that while digital transformation decreases the requirement of manpower in certain positions, it simultaneously increases the demand for people who can execute and implement these transformations. By training current employees to fulfil these positions, an organisation can create a feeling of belongingness and involvement in the change process. Even though the bank was focusing on doing business in a different way than they did, their employees had

valuable information and knowledge about the banking industry that they did not want to give up. By focusing on training people to be ready for new positions, they managed to keep the knowledge inside the organisation.

Hence, we conclude that for any large-scale transformation to be successful, to permeate the barriers of ephemeral transience, and avoid the ignominy of a catastrophic failure, it is vital that organisations consider widespread training and change management initiatives.

4.2.5 Challenges and Roadblocks

When undertaking a large-scale transformation, it is natural to stumble into roadblocks. It could be as simple as the logistical challenge to digitise processes and products. In the example of HIROTEC [\[8\]](#) and Kaiser Kompressoren (Ezell et al. 2018), the authors talk about the practice of installing IoT sensors in their respective products to improve tracking and reduce downtime. Even though these seem to be simple changes, it involves an overhaul of existing practices and requires the organisation to train their employees. The value chain will not benefit the end customer if the employees are not well-versed with the technological changes.

Another challenge that arises is to get people onboard the large-scale changes. As Stark (2020) observes in the case of Springfield Council [\[11\]](#), the residents of the county were hesitant to change as they were concerned about sharing their personal data with government organisations. This problem is particularly characteristic of digital transformation as people are wary about their confidential data. The entire world is becoming more sentient towards digital privacy, and this concern is only going to increase with passing time. Hence, the authors argue that it is necessary for organisations to address these concerns during their transformation journeys. Even if people are convinced about the need to transform digitally, lack of communication can lead to confusion due to the fast pace of changes. Li and Yang (2021) noted this in the case of Haier [\[15\]](#) where the organisation had to track back on their steps to ensure that all employees were on the same page with regards to digital transformation.

All these instances point to a simple solution: clear communication to create a support base of all stakeholders who are being impacted by the changes. The Danish Public Services (DPS) provide a wonderful demonstration of how to address and mitigate these challenges (Scupola, 2019). They undertook a transformation project spanning several years and their success can be attributed to a comprehensible strategy and clear communication. Their strategy was built on iterative development of technology and delivery of results. The people could see the

benefits being imparted by the transformation and thus created a loyal support base for the DPS to continue on their path.

4.2.6 Evaluation and Feedback

In an ideal world, the initial strategy developed for digital transformation would be holistic and comprehensive. Practically speaking, it is nearly impossible to develop a water-tight strategy. It is important to set up feedback loops so that the results of experiments can be fed to the top and the strategy can be fine-tuned based on new learnings. Failure to do so might lead to catastrophic failures. The stubbornness of Nokia ^[31] to adjust its strategy as per changing times led to massive losses and the eventual sale of its mobile division to Microsoft (INSEAD Knowledge, 2017). While their competitors were moving to the open-source technology of Android, they were bull-headed in their approach and felt their current market standing and diverse product range would be enough to sustain their competitive advantage. A similar case occurred with Haribo and its ERP implementation project (Baumann, 2021). They were overzealous with their implementation timelines and did not set up efficient feedback methods to correct their course. So when their new ERP system ran into trouble, there was no corrective mechanism in place.

Another example that can occur when undertaking digital transformation is the resistance to accept or give feedback, as was observed in the case of Al-Rumman Pharma ^[9] (Faridi & Malik, 2020). This family-owned business had a conventional way of doing business up until the point of shifting towards digital transformation. It was not common that employees gave each other feedback or received feedback from other people than their manager. When undergoing digital transformation, the employees were reluctant to open themselves up for feedback. This caused internal friction and conflicts. They started retraining people to create a feedback structure and bring people onboard the change. It took some time, but it eventually worked out.

It is not all doom and gloom for all digital transformation projects though. Even though it might seem cumbersome in the beginning, all successful instances of transformation had a steady focus on developing checkpoints for evaluation. When attempting to digitalise their business, IKEA ^[7] tested out new ideas in some stores and fed it back to their management to evaluate what worked well and what did not (Hagberg and Jonsson, 2022). They were particular to remain true to their core concept while modernising the concept in practice. By doing so they ensured that the digitalisation project did not go off track.

In conclusion, we argue that it is necessary to set up evaluation checkpoints in a long, arduous journey towards digitalisation. This enables checking whether the project is on track and making suitable adjustments to the strategy. This saves both cost and time in the long run, ensuring a successful implementation.

4.2.7 Impact Assessment

Digital transformation is an iterative and continuous process. As discussed previously, it is important to set checkpoints during the implementation of the new strategy. Those checkpoints are necessary not only to set up a feedback process but also to assess the impact of the changes being made. The more prominent kind of impact due to digital transformation is the economic benefit. In most successful cases of transformation, we observed that the organisations reaped an immediate financial benefit. Hummel ^[14] saw total revenue growth of about 40% in 3 years (\$170 million to \$240 million) after implementing its omnichannel retail strategy (Hansen & Sia, 2018). Simultaneously, organisations that were successful in their transformation also reported an increase in profitability. LEGO ^[6] observed an increase in its operating margin by 14% in a ten year period from the implementation of its digital strategy (Andersen & Ross, 2016).

There is a second, more subtle kind of impact made by digital transformation. Digitalisation is not only limited to changes made to products and processes, but a change in organisational culture. The one thing that we have learnt during our meta-analysis is that organisations need to be agile and responsive to the changing landscape. The historical overview of industrial revolutions also preaches similar lessons to all organisations. Digital transformation has a massive impact on the people within organisations. While conducting their transformation activities, Hagberg & Jonsson (2022) observed that some employees of IKEA ^[7] felt a departure from bureaucratic principles and a return to its core values of entrepreneurship.

The authors argue that a transformation effort has failed if it stops after one cycle of change. The end goal of such a massive transformation should be to change the way an organisation does business. The top management and the employees must make combined efforts to stay on top of the ever-evolving business landscape. All stakeholders together must be willing to make incremental changes to their daily activities in order to stay relevant with the changing times.

4.3 Chapter summary

In this chapter, the analysis of the case studies was presented. The results are described in subchapters and are substantiated using examples from the cases that were studied. Cases that did not fulfil the set requirements for this research paper, were not assessed. The results showed the differences and similarities between the cases for each step in the digital transformation process. On some occasions there were several cases taking different approaches but had a similar outcome in the end, this showed that there are different possibilities to be successful.

5. Developed conceptual framework

In this chapter, the framework that we came up with is described. First, the framework will be presented, after which the argumentation for this framework will be discussed. Secondly, the implementation of the framework will be described and the potential benefits that come with using this framework.

5.1 The Framework for Digital Transformation

One of the objectives of this research was to identify similarities and differences in the digital transformation journeys of organisations. During the course of the research, we were able to identify certain similarities (or cohorts) in all the successful and failed transformation initiatives. We realised that the successful stories had evident commonalities and the same could be concluded for the failures as well. Once we were able to isolate these trends, we re-evaluated the case literature and tried to observe evidence of said trends or cohorts in the cases. Even though initially the cohorts were identified on the basis of intuition and primary research, the presence of said cohorts in case literature validated our initial insights.

Once we ascertained that all successful transformation journeys had a similar trajectory, we started building the framework based on the key learnings. Hence, we have come up with 5 steps which we think are essential checkpoints for a successful digital transformation. We are convinced that this is a generalisable and applicable framework for a large group of institutions. This framework can offer support to entrepreneurs, management board executives, change managers, consultants and researchers to get a better understanding of undertaking digital transformation. The framework can be seen in figure 8.

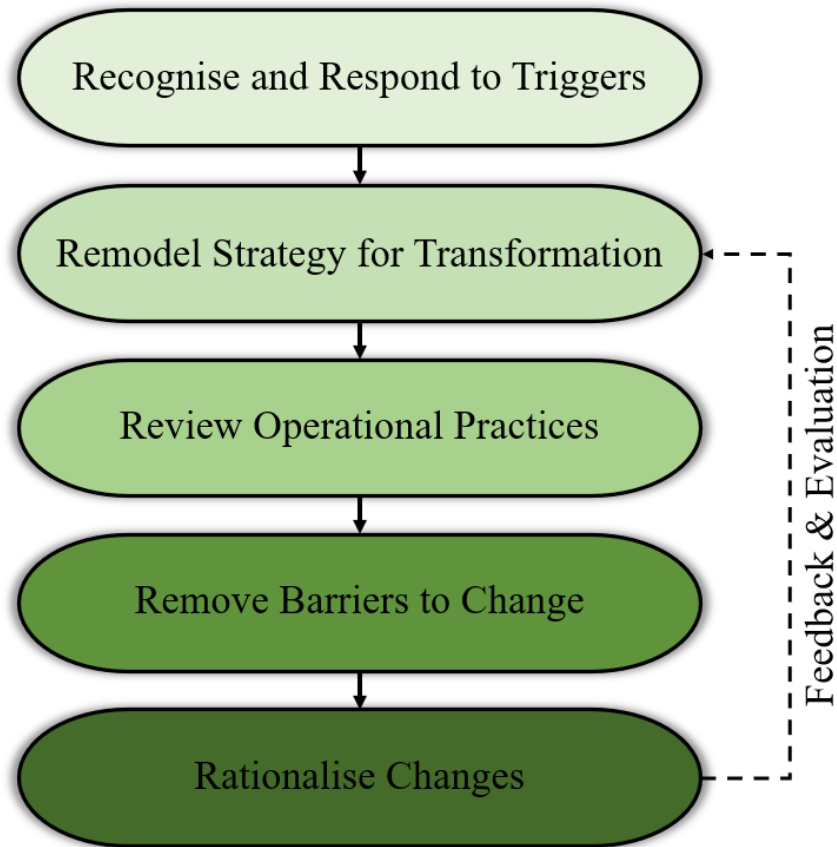


Figure 8. - The Framework for Digital Transformation

5.1.1 Recognise and Respond to Triggers

During the course of the research, we observed that the foremost thing to do is to observe the triggers to change. It is complicated to alter the business as usual for every small change happening in an organisational environment. It is the task of management to recognise such factors and respond to these changes based on the impact expected from them. Hence, it is important to keep a track of both internal and external factors that can compel an organisation to undertake transformation. An overview is given in table 7.

Table 7. - Overview of potential trigger points

Internal Trigger Points	External Trigger Points
Research and Development	Disruptive Innovation
Every firm must invest in research of existing technology in order to improve and innovate. The management must consider the advancements being made internally and utilise the new learnings to develop products, services and processes.	New technologies or disruptive innovations that come up can cause a shift in customer behaviour and create a need to adapt to these changes for organisations. These innovations can come from businesses, governmental organisations or research facilities.
Operating Expenses	Legislation
Cutting down on operating costs is an important goal for every manager. It is paramount that managers keep track of the financial performance of their organisation and take corrective actions in case of any red flags.	Upcoming or new legislation(s) can cause organisations to adapt and to meet the new requirements for this legislation. Legislation can be tackled by undertaking digital transformation.
Process Optimisation	Competitor and Industry Analysis
Technological developments can assist an organisation in making processes more efficient and streamlined. It is a demand of Industry 4.0 for firms to be more agile and responsive to changes.	If the competitive organisations or industry is implementing changes in any way, this could mean a new stream of demand or better way of producing. Undertaking digital transformation can help to align with the external parties.

These are some of the common triggers which were observed by us during the course of the research. This is to give an example of the kind of changes that organisations need to be aware of. In practice, we advise the management of a firm to look outwards and keep an eye on the industry they operate in.

5.1.2 Remodel Strategy for Transformation

Once the management can observe some changes brewing internally within the organisation or in the external environment, it is important to incorporate the findings into the strategy-making process. An organisation's core principles and mission statement are its guiding philosophies. Depending on the long-term vision of an organisation, the strategic ventures must be remodelled to account for the triggers. With the objective of undertaking digital transformation, the organisational strategy should be adjusted and incorporated into daily activities within the organisation. We advise that these strategies must be revisited regularly, and adjustments must be made based on the triggers.

The end goal of digital transformation is to create a cultural change so that the organisation can become more agile. Hence, we recommend subscribing to the "1-5-10 Principle". We found several colloquial instances of this principle of philosophy in print and digital media (Dividends, 2022; Webb, 2019). Just reworking the strategy for the sake of it must not be the goal. The organisation also needs to ensure that the changes being made are relevant to the future vision. Therefore, it might be helpful to gauge whether the strategy sits well with the future vision of organisations in 1 year, 5 years and 10 years. We argue that doing so will ensure that all of the short, medium and long-term goals of the organisation can be achieved.

5.1.3 Review Operational Practices

After a need to change has been identified and the remodelled strategy has been set up, it is time to plan and execute the change. The most important factor in the execution and planning of the change is to get employees involved in the process. Ideally, every department should have at least a few people that are truly involved in the change. They can be the leaders who represent and drive the change in their respective teams. This must be done not only to get a support base among the employees but also to gain valuable input/feedback from people that work with the systems, processes or products on a daily basis.

Secondly, communicating the strategy to everyone in the organisation plays a big part in the success of a transformation. Everyone should be up-to-date about the change and the potential setback the change has. In order to be successful in the execution of the change, the change should be implemented in the daily organisational activities. For the change to be part of daily activities, time should be spent on implementing the changes top-down.

A big mistake some organisations make is only communicating the start of the process, the vision and the strategy, but fail to communicate possible drawbacks. Secondly, all employees should also be clear about their respective tasks and responsibilities during the change initiatives. It is vital to not alienate people in the organisation during such transformations. If there is no clear line of communication throughout the process, people start questioning themselves and the strategy. Therefore organisations should review their practices regularly and communicate and/or adapt accordingly. A successful digital transformation can only be executed with all the stakeholders onboard the changes.

5.1.4 Remove Barriers to Change

Any new change process will come with its own unique set of roadblocks and challenges. A management undertaking digital transformation must be wary of such impediments to progress, and remove these barriers effectively. During the research, we observed two major kinds of barriers to change in any organisation -

1. Operational Roadblocks - These are the simpler and relatively easy to solve barriers to change. These can be the horological, financial, technological and logistical challenges of implementing a new software, installing an IoT sensor or shifting from traditional storefront sales to e-commerce. These are the expected challenges that would occur during any kind of transformation project. These roadblocks can be overcome by carefully experimenting with new technologies and then incrementally applying the changes to existing products, processes or services.
2. Resistance to Change - This is a more complicated and nuanced problem which is experienced when people are subjected to change. There has been some prior research on this topic by eminent researchers and is something that is visible in digital transformation projects as well. It is well known that involving people in a change process, creates a better understanding for people why an organisation is undergoing change. Besides, adding responsibilities to people creates a feeling of importance among employees during the change process (see section 2.3). Employing good practices like these, help people overcome their resistance to change.
3. Loss of Employment - Another major concern that people have with digitalisation is that technology will overtake their jobs. This apprehension is quite an expected reaction from people and can be overcome by clear, open communication. We have observed during our research that even though digitalisation might remove the

traditional jobs, it creates several new jobs that help digitise existing organisations. Such information must be shared with people so that they can see their future in synergy with digital transformation.

While undergoing a large-scale transformation project, it is essential for the management to keep these barriers in mind. In case these factors are not addressed properly, the whole project stands the risk of failure. We have previously discussed these issues and possible mitigation solutions in sections 4.2.4 and 4.2.5.

5.1.5 Rationalise Changes

Every change process is initiated with an end goal in sight. Visualising an end goal is even more complicated in the case of large-scale transformation as it is a lengthy and cumbersome process. In line with Kotter's (1995) suggestion to celebrate small wins, we recommend creating checkpoints for the transformation process. The checkpoints must be designed keeping the end goal in sight. This creates an opportunity for the management to evaluate the progress of the change initiatives. Simultaneously, it also allows for the checkpoints to be changed based on the changing priorities of the organisation.

Once the changes are instituted and the results are visible, we recommend performing an impact assessment to see whether the results were positive or negative. Secondly, we recommend creating several feedback loops for the entire transformation project. The feedback mechanisms should be grounded in the structure of the organisation and should flow in both directions, i.e.- *top-down* and *bottom-up*. The feedback mechanism should be used to provide feedback to the top management so that they can see if the change(s) is realistic and relevant to the core vision of the organisation. Similarly, the mechanism could be used to share feedback to other stakeholders. Some potential improvements can be made with operational practices that are executing the transformation strategy.

By implementing the checkpoints and a robust feedback mechanism, an organisation can rationalise the changes to become a part of the organisational culture. This will allow people to both celebrate the small successes they have and also correct their course in case of mistakes being made. All stakeholders will become a partner in change and will feel motivated to aid the transformation project. Throughout the course of this thesis, we have emphasised the importance of making digital transformation a continuous process. If the transformation journey is halted after the first iteration, then the organisation will find itself at their wit's end when the next major change appears in the horizon. We firmly believe that

organisations need to be alert to changing industry landscapes and be prepared for the next big disruptive change.

5.2 Reasons to opt for the Framework

This framework shows a step-by-step approach for organisations, including entrepreneurs, management board executives, change managers, consultants and researchers to undertake digital transformation. Most large consultancy organisations have their own roadmap or framework for digital transformation (section 1.1.2), however, the possibilities of using these frameworks are only possible if organisations decide to partner with these consultancy firms. Another downside of using external groups to undertake digital transformation is the lack of involvement of employees, and the knowledge that is created does not remain in the company after the transformation.

On the other hand, there are several papers written about change management and the steps that can be taken to undergo change. Some examples are discussed in section 2.3. There are some fundamental differences between our framework for digital transformation and the existing roadmaps.

- Firstly, these roadmaps often focus on the people (Kotter's 8 steps of changes, 1995) and cultural (Cameron and Quinn 9 steps of cultural change, 2006) aspects of the change process. We argue that they lack the perspective of the entire organisational change.
- Secondly, in Kotter's model for change, he mentions that a "powerful coalition" should be formed, where change managers and leaders are appointed. We recommend that the entire organisation must be involved for a successful digital transformation. Everyone should be a part of this change, instead of a "few leaders driving the change".
- Lastly, this framework has been built upon the cases of existing organisations that underwent large-scale digital transformations. Therefore the framework for digital transformation gives a more hands-on process compared to the more generalised frameworks for general (cultural) change, for example, Kotter and Cameron & Quinn.

5.3 Expected Benefits

We are convinced that organisations can enjoy manifold benefits upon successfully completing their digital transformation project. It can take the form of direct economic remuneration, development of internal processes and improvement in organisational culture. The benefits are discussed in further detail below.

5.3.1 Securing Competitive Advantage

Digital transformation can help an organisation segregate itself from its competitors. Innovation in technology can help firms leverage a higher cost and/ or attract a larger market share. This can help an organisation establish competitive advantage over its direct rivals. There are other ways to establish a competitive advantage as well, but most of them are quite transient and unsustainable. Using technology as a platform can offer sustainable solutions to gain an advantage over competitors (Lipovich, 2020). With technological innovation an organisation can cement its position as a segment or an industry leader. The technological innovation can be in the form of hardware development, advanced data analytics principles or enhanced user experience (UX) for customers. CEO of Berkshire-Hathaway and serial investor Warren Buffet describes this as forming a “moat” around the company - a defensive barrier that prevents an organisations’ profits from being eroded by competitors (Investopedia, 2021).

5.3.2 Enhancing Transparency

Digitalisation of internal processes ensures transparent flow of information between all stakeholders. We have emphasised on involving the entire organisation in the transformation process multiple times in previous sections (e.g. 5.2). This can only be achieved by exhibiting transparent information sharing. As was evident in the case of Springfield Council [\[4\]](#) (Stark, 2020) they utilised their new digital capabilities to communicate openly with all residents, to define the change processes and the need to change. This was one of the fundamental reasons for the success of their transformation initiative. We have also previously discussed that digital transformation brings a concern around data privacy (section 4.2.4). It would serve well for the long-term goals of the organisation if they can address these concerns by practising honesty and transparency in their processes.

5.3.3 Improvement in Processes

One significant goal of digital transformation is to make an organisation more agile and dexterous in the wake of an ever-changing market landscape. Digitalisation can help organisations improve their processes to fit better with the current times. An efficient process can reduce operational costs and the lead time in processes, while simultaneously increasing profitability. We observed a similar occurrence with IKEA ^[7] (Hagberg & Jonsson, 2022) when they tried to modernise their “concept in practice” while staying true to their “idea concept”. IKEA ^[7] still wanted to provide affordable furniture to many people but they wanted to leverage the capabilities of the internet to boost their e-commerce channel. They exhibited their success by efficiently implementing digital transformation.

5.3.4 Establishing Company Culture

Throughout the duration of this thesis we have emphasised the importance of digital transformation being a continuous process. An organisation can not rest on its laurels after succeeding in one transformation project. As defined earlier, a “large-scale transformation” means an overhaul of the way a company does business. In order to sustain this momentum, it is essential that the people employed in the organisation reevaluate their daily practices. An efficient digital transformation is one which enables people to continue on the same trajectory. Truly changing culture, moreover, requires that support for a digital reinvention flow through the management hierarchy right down to every front-line employee, so the full organisational pyramid is tuned towards digital (McKinsey, 2018).

5.3.5 Stakeholder Benefits

As described in section 2.2.2 by Fenton, Fletcher & Griffiths (2019), most involved stakeholders reap benefits from digital transformation. The most obvious and direct benefit can be attributed to the shareholders. Several companies report improved financial performance due to successful digital transformation. Internal stakeholders, like employees, could benefit from digital transformation as new technologies creating more efficient processes can reduce handling time. On the other hand, external stakeholders, such as customers, could benefit from digital transformation because their experience is often improved by digital technologies. An example is shown in the case of Hummel where they improved their vendor experience. At first, all vendors had their own system to keep track of

stocks and sales for Hummel products. After the digital transformation, Hummel centralised their catalogue to improve the experience for their vendors. This resulted in a more streamlined process for both Hummels and their vendors (Hansen & Sia, 2018).

5.4 Recommendations for the Future

Digital transformation at the organisational level is a long process and requires a lot of determination and commitment to execute. It requires an innate understanding of the customer’s (or any stakeholders’) needs to design the digital strategies to meet the requirements. Hence, digital transformation must look to add value to the customer. For the customer, “value” is the benefits expected in return of the investment in a product or a service. Value has a much wider meaning than just payments, cost, money-price or exchange values. Fenton, Ahmed & Hides (2019) explain that a consumer's investment is a measure of how much of their time they will commit to acquire a product or a service.

Organisations need to determine the value of a product or service and how customers will perceive this. This understanding is necessary for a good business model. Fenton, Ahmed & Hides (2019) recommend conducting performance assessments of the digital changes being made. They highlight productivity and efficiency as the cornerstones of measuring performance. Simultaneously, they offer importance to innovation to either fuel growth (*for-profit*) or social impact (*non-profit*). In case of digital transformation, the expected goals at the starting of the change process must be assessed in terms of productivity and efficiency.

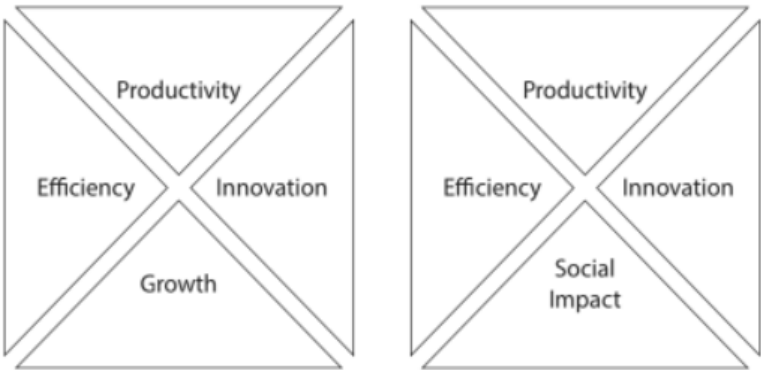


Figure 9. - Organisational measures of success with growth- or social-oriented strategies (Fenton, Ahmed & Hides, 2019).

Lastly, we recommend that an organisation undergoing change should appoint *Transformation Auditors* within the firm. They can be the members of the team that is under transformation. The management must provide them with relevant measures of data for them to assess the change at the ground level. With the digitisation of processes, the access to data will increase. With this also comes the logistical nightmare of storing and sorting the data. It is upto the management to decide what data to prioritise and the type and quantity of data to be stored and evaluated. If at the beginning of the change process the goals of the organisations were clear, then the data can be applied to track the achievement of said goals. We believe that such diligent performance assessment is vital during the initial application of the Framework.

6. Conclusion

The advancement in Industry 4.0 and the propagation of internet technology has put a lot of pressure on organisations to reinvent themselves in order to stay relevant. Although most managers these days understand the benefits they stand to achieve by transforming themselves digitally, surprisingly few understand what it means to truly digitise an organisation. And the widespread stories of failures fills scepticism in their hearts of managers brave enough to undertake an ambitious transformation project. During the tenure of this research, we have realised that digital transformation is a double-edged sword. On one hand, is the risk of becoming irrelevant in a competitive marketplace by being hesitant to transform. Whereas, the other dire consequence is that an organisation invests its time, effort and money into a project and see it turning into a catastrophic failure. For organisations to stay competitive they are required to lead a continuous digital transformation. Secondly, we argued that there is a large gap in available practitioner research for organisations who wish to internalise this change process, instead of outsourcing it to a consulting firm.

Therefore, this study aimed to identify a standardised framework to provide a direction for organisations to pursue their digital transformation strategies. Relying on existing research the authors looked to answer the following research questions -

- What similarities and differences were observed in organisations that underwent digital transformation in the past?
- What steps can organisations take to undergo digital transformation?

Based on the literature review, we decided to conduct a meta-analysis of the existing case literature discussing the successes and failures of different organisations. The literature was deliberately kept to be quite diverse with organisations from different industries and operating on different scales. This was done in order to ensure that the final result (framework) is truly homogenous and applicable to all kinds of organisations. We conducted our research based on the various steps recommended for a successful meta-analysis (Himmelfarb Health Sciences Library, 2022). Once the relevant cases were identified they were subjected to a rigorous evaluation to gather sufficient information based on the similarities and differences of their respective transformation journeys.

Upon doing so, we were able to identify some key parameters that were prevalent in almost all the cases. The similarities and differences in these parameters were analysed and discussed, the outcome of this can be seen in table 8.

Table 8. - Summarising the key findings from the analysis

Topic	Key Findings
Trigger Points	There are some internal (research and development) and external triggers (competitor behaviour) in an organisations' environments that are catalytic to cause change. The management must keep an eye on these factors and remodel their strategy accordingly.
Strategic Initiatives	Digital transformation is led from the top. It is vital that all the top management agree and align themselves towards a common goal. Moreover, based on the environmental triggers, the strategy must be reworked accordingly.
Planning, Delegation and Execution	Any transformation initiative will fall flat if all the stakeholders are not included in the change process. It is important to communicate the strategy to everyone and bring them onboard with the changes in their daily tasks and responsibilities.
Training and Change Management	Any change initiative will be met with internal resistance. In the case of digital transformation it is even more stark because of the data privacy concerns. The management must employ widely available change management principles to address these concerns. A large-scale transformation initiative will not be successful without efficient change management practices.
Challenges and Roadblocks	There are challenges to any digital change. Ideally, the management should be able to foresee such roadblocks and account for those in the initial strategy. For other practical purposes, a strategy should be agile and flexible to be able to adjust to unforeseen challenges.
Evaluation and Feedback	To build a sustainable process it is important to have a steady feedback loop. Digital transformation is a long drawn process. Hence, it is necessary to set checkpoints where the organisation can review its progress and make adjustments to the strategy wherever necessary.
Impact Assessment	Digital transformation has a two-fold impact. One is the direct economic benefit of increased sales, market share etc. The other more subtle impact is on the organisational culture. Digital transformation is a continuous process and the stakeholders must be empowered to think for themselves. They should be able to deal with the next phase of technological innovation.

This information was tabulated under some standard captions which would eventually be used to feed into developing the Framework for Digital Transformation. This framework can be used by entrepreneurs, management board executives, change managers, consultants and researchers looking to delve deeper into generalised transformation frameworks.

Other than answering the research questions, we would like to look back at the purpose we had for this research and see if we found this to be fulfilled or not. The purposes of this research have been described in section 1.3 and are shown below:

To study the existing transformation frameworks with a fragmented focus on different aspects of transformation. Bring together the insights from these frameworks into a more coherent result.

We believe that we fulfilled this purpose by conducting a meta-analysis on a total of 16 cases of organisations that underwent digital transformation. We analysed the similarities and differences in the cases and brought these together in section 4. We set up grading criteria for the cases and analysed them step-by-step using examples from several cases. The summary of each case can be seen in the appendix.

Using these inferences to develop a generalised and replicable framework for:

- *Organisations to digitalise their business*
 - After carefully analysing the cases we compared the findings in similarities and differences between cases and the literature carried out in an earlier stage. After the comparison we started developing our own framework for digital transformation. In this framework we took a different approach from other existing frameworks and developed a generalised framework that can be used for organisations to digitalise their business.
- *Researchers to overcome the initial barrier of extensive literature review*
 - We see benefits not only for organisations but also for researchers using this framework or cases to conduct further research. For some researchers, the initial barrier to conduct extensive (literature) case research might be big. Therefore we think that supplying both summarised case studies and a generalised framework can be beneficial for future research.

6.1 Practical Implications

The purpose of this study was to develop a framework for digital transformation based on the authors' assessment of cases of previously successful and unsuccessful digital change initiatives. To this end, an extensive meta-analysis was conducted on available literature about digital transformation and the strategy, operations, marketing and technology affecting this transformation. Once the relevant case studies were identified, they were critically evaluated to find possible similarities in all the organisations' respective journeys. This allowed the authors to create the framework for digital transformation. The research also briefly discusses the implementation and further performance assessment of the application of the framework. This research provides a stable framework for managers willing to internalise the digital change within the organisation. Lastly, this framework provides an academic overview of a field otherwise dominated by the techno-jargon of large consulting firms.

6.2 Limitations and Future Research

Even though this research draws a conclusion, like every research, this research can be of greater power or depth by carrying out more research. We came up with what we think are the most relevant limitations and recommendations for future research.

1. First of all, the pool of case studies that were used for this research, consists of 16 case studies. To add more power or depth to the research, more cases can be analysed. When more cases are analysed, a greater number of variance in the cases will be realised. We feel we did the best job we could do in the timeframe we were given to create a heterogeneous pool of cases. With more time and analysing more cases, an even more robust framework can be developed.
2. Secondly, some practical experiments must be conducted based on the Framework for Digital Transformation. When testing the framework, the impact of using this framework can be validated to see whether using the framework is practically successful or not. Ideally, this framework should be tested in multiple organisations with different industries and sizes to determine if the framework is general enough. This assessment could be substantiated using statistical analysis.
3. Thirdly, this research used a qualitative approach to carry out this research paper. The use of this method created a mixed feeling among us. On the one hand, the cases that

were used were all events that happened in the past and therefore practical data that was used for the meta-analysis. On the other hand, more depth or power could have been added to this research if managers that had to cope with digital transformation were interviewed. Their experiences could have substantiated our inferences and added more depth to the result.

4. Fourthly, the use of non-academic articles for some of the cases, limits the power and reliability of this research. We sometimes used non-academic sources (like websites of consulting companies) for the cases we were evaluating. We found that there were not enough academic texts as case studies which could be used for this research. Therefore, we had to rely on alternate sources for case studies that describe digital transformation journeys. Despite this, the data that was used by us was chosen with care to ensure the veracity and reliability in the data pool.
5. Fifthly, the authors were given a timeframe of ten weeks to complete this research, aside from the greater number of cases described in the first point, this timeframe gave limitations to the paper in general. If more time was given, the cases could have been analysed with more depth, the framework could have been tested and better insights from current managers could be implemented into the research.

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8. Appendix

8.1 Cases

While analysing the cases, we did our best to keep the information as original as possible. This sometimes means that the information is taken directly from the sources without paraphrasing. We did this for potential future researchers who might want to study these cases. In addition, the sources of the individual cases are included in the reference list.

8.1.1 Case 1 - Springfield Council

Case Name	Digital Transformation at Springfield Council
Author	John Stark
Industry	Legislative branch of government
Scale	Government Agency
Status Quo	Currently, Springfield Council uses a website and social media (Facebook and Twitter). The website has a mass of information like tax rates, tax payment dates; administrative forms for download etc.
Trigger Points	Too much handling, causing to reduce administrative and operating costs, and improve resident experience
Strategic Initiatives	<p>Primary objectives - Develop apps to facilitate payment of local services, support ride sharing, and show currently available parking spaces.</p> <p>Other objectives - adjusting traffic lights to traffic flow; switching street lighting on and off depending on actual conditions, not pre-set; increasing use of smart energy metres to reduce energy usage; introducing instant fines for road speed and parking violators.</p> <p>The council is also rethinking its current policy about affiliate marketing, banner advertising, and publishing sponsored content, to monetise its services.</p>

<p>Planning, Delegation and Execution</p>	<ul style="list-style-type: none"> • Using tele-care and other assistive technologies that enable the elderly, sick and disabled to continue living at home. • Offering online paperless applications for school places. • Enabling cashless parking payment. • Using GPS technology to reduce costs and improve the quality of waste collection and cleaning. • Self-service kiosks to request a bulk waste item collection, making a payment, and reporting environmental problems such as graffiti and fly-tipping. • Analysing socio-economic data to better target services on those who most need them. • Installing smart sensors in parking bays and on road surfaces.
<p>Training and Change Management</p>	<p>The council realised that it would need to put in place a change management program to help employees and residents adapt to the new digital environment. The council wants to be sure that people will understand both the need for the changes and the changes. People need to be aware of the council’s transformation journey. That requires reaching out and building awareness, addressing issues, and gaining the trust and support of the community.</p>
<p>Challenges, Roadblocks</p>	<p>There were initial concerns about sharing personal data, and trusting government organisations. Many members of the public were found to be concerned about correct and secure use of their confidential personal data. Other residents felt that digital transformation was a disguised way to reduce their benefits and services. Some felt left out because they were unable to use digital technology. Many council employees saw transformation as a way to eliminate their jobs.</p>
<p>Evaluation and Feedback</p>	<p>People, activities and digital technology are closely entwined and need to be addressed together with a holistic approach, otherwise the expected transformation won’t materialise. Strong leadership from the top is essential for Digital Transformation. Keep away from the technobabble and the buzzwords such as Smart City</p>
<p>Impact Assessment</p>	<p>To be seen in the future.</p>

8.1.2 Case 2 - Springfield State University

Case Name	Digital Transformation at Springfield State University Institute
Author	John Stark
Industry	Education
Scale	Large Company
Status Quo	<p>Consultants found that, historically, the operating model was based on four main activities:</p> <ul style="list-style-type: none"> • Doing research to create knowledge • Storing knowledge in the library • Transmitting knowledge to the next generation (teaching) • Certifying by examination that students had reached a required level
Trigger Points	<p>Academic staff often lags behind that of people working in local companies. Companies have been forced to respond to change, or go out of business, their knowledge and know-how is now years ahead of that of staff who haven't been under such pressure. Some local companies have even set up their own Academies, saying that they can learn nothing from our academic staff. Also, some may lack professional teaching skills, such as presentation skills, and skills to engage with students. Others have poor communication techniques, poor interaction with students, and are not seen as skilled educators.</p>
Strategic Initiatives	<p>Increase focus on customers (students) - track future jobs, student debts, no active contracts</p> <ul style="list-style-type: none"> • Focus on product and service portfolio - course construction, optional courses • Extend revenue streams to embrace government-funded teaching and research grants, borrowing, charities, endowments, philanthropy, naming opportunities, as well as educational and research partnerships with local companies.

	<ul style="list-style-type: none"> • Grow portfolio of products and services, developing new courses and new fields of study. • Set up a Digital Transformation team including administrators, academics and students.
Planning, Delegation and Execution	<ul style="list-style-type: none"> • Develop a communication program explaining why it's important to transform, how they will transform, and the benefits of digital transformation. • Extra activities like workshops, a project blog, intranet updates, poster displays, town hall meetings, lunch-and-learn sessions, and after-works. • Establish networks within the organisation to share digital expertise. • Identify and train so-called "change agents". Some are faculty, some are students.
Training and Change Management	<p>Phase 1 -</p> <ul style="list-style-type: none"> • Organising a series of workshops in areas such as leadership development, pedagogical methods, professional development, recruitment, performance management, collaborative and interdisciplinary skills, and technical training • Develop e-learning and MOOCs platforms. • A cloud-based platform providing free and open source office productivity applications and administrative systems. • Implement a new Cloud-based payment system. • Review use of social media. Better target the customers (students). • Redesign the web site and develop new mobile apps. <p>Phase 2 -</p> <ul style="list-style-type: none"> • Each student will be able to access any information and tools they need through SMEP (Springfield's My Education Portal). • Provide training to everybody on how to use the new tools.
Challenges, Roadblocks	<p>New recruits were dissatisfied by the hierarchical nature. The IT people who've been in the university for decades tell them they need to take the time to understand the university, not just talk about new technology and unicorns. After a few months, the new hires tend to burn out, apparently frustrated by the environment.</p>

Evaluation and Feedback	In the third step towards digital transformation, Target is that less than half of courses will be held in lecture theatres. Most courses will be in online collaborative workspaces. Having transformed the approach to classroom lectures, the fourth step is to target practical, hands-on, “lab” work.
Impact Assessment	Phase 1 and 2 changes were mostly appreciated by everyone.

8.1.3 Case 3 - Nokia

Case Name	The Strategic Decisions That Caused Nokia’s Failure
Author	Insead Knowledge
Industry	Telecom equipment, Consumer electronics
Scale	MNCs
Status Quo	Nokia relied on the success it had in the 1990's and continued with their strategy. Their strategy was to keep thinking in hardware products, combined with creating a wide product portfolio. They hoped to match market segmentation based on lifestyle/preferences.
Trigger Points	At one point they were relying on an operating system called Symbian (instead of Android). This resulted in a lack of strategic possibilities for the company and structure for the employees.
Strategic Initiatives	In 2004, Nokia planned to overcome their struggles in the telecom industry by replacing their hierarchical structure to a matrix. However, this matrix design turned out to be slightly centred in favour of the product family. This resulted in internal departments, like sales, HR etc. becoming suppliers to the teams that were driving the show.
Planning, Delegation and Execution	Nokia had a hard time balancing between seeing and doing. Although they were predicted as one of the first companies to become more connected with the Internet of Things. There was

	a huge gap between the strategic vision mindset from the 90's and the organisational execution of the 00's, this led to a failure in filling their predictions regarding the future of telecom.
Training and Change Management	The change of strategy from hardware to software. There was also a vision gap between executives and operational execution.
Challenges, Roadblocks	The feedback that Nokia offers is to keep questioning what you are doing, constantly thinking about the validity of a strategy for the upcoming 2, 5 and 10 years. Ask yourself why or why not? This constant reflection will help to be critical about business and ideas.
Evaluation and Feedback	This approach led to the sale of Nokia's phone department to Microsoft and a massive decrease in revenue and employees worldwide.
Impact Assessment	N/A

8.1.4 Case 4 - Kodak

Case Name	Kodak
Author	Chunka Mui, Forbes & Scott D. Anthony, Harvard Business Review
Industry	Photo and Film camera industry
Scale	MNCs
Status Quo	Focus on film/rolls and refusal to adapt to the digital camera market.
Trigger Points	Their main trigger to undergo change, is the fact that their competitors started developing digital cameras, especially for the filming industry. Since their core audience is the filming industry they had to adapt to this market change.
Strategic Initiatives	Kodak's initiative regarding their brand had to do with Kodak Moments. This marketing campaign started in the 70's and resulted in a 85% market share for photos and 90% market share in film. In the 90's when digital cameras were on the rise, Kodak ignored it.

	This resulted in a slow market loss until 2005. In 2005 the digital camera's took a massive step in market share since the technology of the competition got a big upgrade, this led to a huge decrease in sales and revenue from 2005 onwards. They were simply stubborn and ignored the customer's behaviour.
Planning, Delegation and Execution	The fun fact is that Kodak invented the digital camera and even got it patented in 1974. Even though they invented it and were the market leaders in 2004, they failed to kick off this strategy in the USA. Their problem was the fact that they never put digital cameras as a main focus but stuck with their film/photo rolls. In the end this resulted in choosing the wrong option and led to a bankruptcy.
Training and Change Management	Kodak's business model was based around film. When the film section started to fade away in the face of the digital camera industry, Kodak was losing large amounts of money since their camera/photo section was hardly profitable. Back in the days they almost gave away their cameras because people needed this before they invested in films. When their film section disappeared the profitability of Kodak disappeared with it.
Challenges, Roadblocks	In 2005 when they had to compete with other companies for the first time, they had a hard time keeping up with this competitive pace. To overcome this challenge they tried to enter the printing market, but they found out that this market was quite stable and not attractive for new entrants.
Evaluation and Feedback	NA
Impact Assessment	The lack of adaptation and stubbornness in Kodak resulted in a bankruptcy in 2012. There is a small business unit of Kodak left but the big company it was in the 70s to 90s is flushed away.

8.1.5 Case 5 - Springfield County Regional Bank

Case Name	Digital Transformation Springfield County Regional Bank (SCRB)
Author	John Stark
Industry	Banking

Scale	SME
Status Quo	Largely manual and paper-based processes.
Trigger Points	<p>Services The bank still asked the customers to fill in all sorts of forms (mostly paper documents). After which customers had to wait several weeks before the bank contacted them.</p> <p>Customers The bank was manually processing massive volumes of data. For instance, it took upto three weeks to open a new bank account for a customer, while the actual processing time was only a few seconds. The rest of the time was consumed due to manually checking papers.</p>
Strategic Initiatives	<p>Services An internal research was conducted and it appeared that their legacy systems could easily handle the digitalization but that their internal workings were not ready for it.</p> <p>Customers The bank introspected whether this was really needed for existing customers. The process was time consuming for both the customers and bank. They realised that they can automate this process for loans and mortgages as well, thereby increasing customer satisfaction.</p>
Planning, Delegation and Execution	During the first two attempts towards digital transformation, the process was mostly carried out at the top of the organisation. The employees were not involved and leading to a feeling that this change is a process to lose their jobs to automation.
Training and Change Management	The bank concluded that undergoing digital transformation results in a decrease of people in certain positions but on the other hand increases the demand for implementing these transformations. There needs to be an investment in training to educate employees in order to make the change happen in a positive way. They focussed on understanding the relationship with clients first and areas of

	improvement, rather than adapting to a technology straight away. In order to make this digital transformation successful they chose to focus on involving the employees from the start of the transformation. By doing so, they started the (needed) cultural change from Day 1. Also, the employees felt valued and saw a change in doing business themselves.
Challenges, Roadblocks	A common challenge in the banking industry is the difference in customers (age, wealth and behaviour) causing them to act differently from each other. Secondly, they offered several different channels to customers. Keeping a common look and feel among these different channels is hard to maintain. Lastly, when uploading existing systems onto the cloud, the bank realised the old systems were basically a bowl of tangled spaghetti. Therefore there was hardly any structure present and required massive resource investment for rectification.
Evaluation and Feedback	The bank attempted digital transformation thrice. During the first attempt they decided to move all systems online. Even though the online systems were operating successfully they stopped this process since they did not know what they were aiming for. In their second attempt, they picked two of their VPs to lead the transformation. Although they had good experience in the banking industry and were capable at creating value for customers, the digital transformation process still did not take off. Both the VPs concluded that the employees of the bank had to think differently, some had to disengage from day-to-day running a business to going back to the basics and understanding the business values.
Impact Assessment	The results of the third phase of digitalisation are yet to be seen.

8.1.6 Case 6 - LEGO

Case Name	Transforming the LEGO Group for the Digital Economy
Author	Peter Andersen & Jeanne W. Ross
Industry	Toys
Scale	MNCs

<p>Status Quo</p>	<p>The LEGO Group had grown the number of SKUs from 6,000 in 1997 to over 14,000 by 2004. This diverse product portfolio involved complex and expensive production processes. Production was rigid and slow, and many of the LEGO Group’s new product launches and innovations failed. Meanwhile, LEGO Group designers had not considered the cost of materials in their designs. At the other end of the supply chain, large chains such as Walmart were accounting for more than two- thirds of the company’s sales. But the LEGO Group had not developed transparency in regards to store demand and inventory levels. Ultimately, supply chain issues resulted in lost sales.</p>
<p>Trigger Points</p>	<p>In early January 2004, Kjeld Kirk Kristiansen, owner of the LEGO Group and a member of the founding family, invested a substantial portion of his own fortune into the dying company, stepped down as CEO, and appointed former McKinsey consultant Jørgen Vig Knudstorp as the new CEO.</p>
<p>Strategic Initiatives</p>	<p>The ERP platform underlying supply chain processes was just one of several key platforms critical to the LEGO Group’s core business. In 2008 the LEGO Group consolidated multiple HR platforms into a single global platform. In 2009 the company started implementation of a global manufacturing platform called Combi 2. To implement the business changes needed to effectively deliver value from the SAP platform, Knudstorp deputised an operational team of logistics, sales, IT, and manufacturing managers that met regularly for a year to revamp operations. In 2011 the LEGO Group further extended its enterprise platform with a new product lifecycle management (PLM) system. PLM influenced more than 80% of the business processes at the LEGO Group, and effective PLM was essential in accelerating the company’s ability to quickly bring new products to market.</p>
<p>Planning, Delegation and Execution</p>	<p>In June 2015, CEO Jørgen Vig Knudstorp posted a blog post for all employees in which he mandated that the company approach digital and business matters the same way. “No more digital strategy,” he pronounced. Instead, a directive made leveraging digitalization one of the LEGO Group’s four strategic priorities. The transformation that had accompanied the implementation of the LEGO Enterprise</p>

	Platform had developed important capabilities that positioned the company to leverage digitalization. These capabilities touched three major areas within the company: (1) streamlined decision making, (2) direction for future IT development, and (3) global collaborative culture.
Training and Change Management	Becoming digital would be a challenge for many employees who appreciated the stability of predictable standard processes. These employees had not started thinking in terms of digital requirements, and the earlier transformation designed to instil discipline in operational processes had not positioned them to think about experiments and innovation.
Challenges, Roadblocks	In 2016, the LEGO Group was reaping significant benefits from its enterprise platform, including faster innovation, enhanced customer relationships, and efficient supply chain processes. The company had also started to offer digital enhancements to its toys and to engage digitally with end consumers. These efforts had exposed both the vast opportunities and the unique challenges of increasing digitization. The LEGO Group was looking to ensure that the company would be able to recognize and adopt important new technologies and business opportunities quickly. Leaders were particularly focused on requirements for new systems and processes, and new skills and mindsets in its workforce.
Evaluation and Feedback	The transformation was found successful in the end. In the beginning most employees were struggling to adapt to this way of working since their CEO left and was replaced by a "young inexperienced CEO". On the other hand they did not feel that going digital was the way to go in the beginning. By taking it step by step, they were satisfied in the end.
Impact Assessment	Since the start of their digital transformation journey in 2005 they increased their operating margin by +/-14% until 2015.

8.1.7 Case 7 - IKEA

Case Name	Exploring digitalisation at IKEA
Author	Johan Hagberg, Anna Jonsson
Industry	Retail
Scale	MNCs
Status Quo	Steady expansion using IKEA's core principles of "idea concept" and the "concept in practice". The idea concept refers to IKEA's vision "to create a better everyday life for the many people", its philosophy of co-creation (i.e. "We do our part, and you do yours"). The concept in practice refers to IKEA's practices of examining specific sets of variables whilst adjusting to local markets.
Trigger Points	The two concepts are mutually dependent; if the concept in practice does not change, then the practices of the idea concept will eventually become irrelevant and not reach "the many people". It is important to return to a state of exploration in which key variables describing the idea concept and the established concept in practice would be re-evaluated. In 2014, IKEA retailers in the USA witnessed a cannibalising effect on their physical stores because of e-commerce.
Strategic Initiatives	Even though digitalisation was becoming a widely discussed concept in retail, it had remained undefined. It was unclear how, or even whether, it was distinct from e-commerce. IKEA's global expansion manager initiated several internal projects to explore what digitalisation meant and how it might relate to IKEA's business idea. (See image attached below). Making sense of digitalisation thus involved distinguishing digitalisation from e-commerce to not only explain how the concepts differed but also make digitalisation manageable for and relevant to customers. Building upon lessons from that work, IKEA transitioned into the second activity of exploration where it began relating digitalisation more explicitly to IKEA way of doing business.

<p>Planning, Delegation and Execution</p>	<p>The person responsible for organising the “Future Role of the Store” project expressed the importance of encouraging all stakeholders to be curious about the future and not rely upon the established business model. Moreover, increasingly more IKEA managers realised that because physical stores played such an important role in IKEA’s business model, which “comes to life in the store”, it was necessary to connect the “E-Commerce Programme” to other projects initiated to explore the potential consequences of digitalisation.</p>
<p>Training and Change Management</p>	<p>The second activity of the exploration phase, refers to assessing digitalisation in relation to established ways of doing business in three steps: visualising (i.e. what the future might look like), mapping (i.e. what functions, areas and parts of the business model will be involved) and evaluating (i.e. how digitalisation will affect the business model and current ways of doing business). Thus, to be able to integrate digitalisation with the business model, it was necessary to experiment with numerous ideas and solutions as was done at numerous IKEA locations. Experiences from testing new ideas and solutions were transferred back to the IKEA Group and Inter IKEA Systems. Thus, an important step was reviewing and learning from those experiences followed by transferring them internally within the organisation.</p>
<p>Challenges, Roadblocks</p>	<p>Moving from a legacy family-owned business, to a global and digital organisation.</p>
<p>Evaluation and Feedback</p>	<p>All of the work to prepare IKEA for the digital shift had prompted a return to the company’s roots and the questioning of proven solutions. IKEA’s approach of digitalisation could thus be understood as returning to the company’s original idea; the understanding of the idea concept will never change, but the concept in practice has to be rethought and new ideas and practices tested and evaluated in order to continue to reach “the many people”. Some even stated that IKEA, which they felt had become too bureaucratic in recent years, was now returning to its core values and embracing a more entrepreneurial mindset.</p>
<p>Impact Assessment</p>	<p>The revenue from e-commerce channel increased from 1085 million dollars in 2015 to 8611 million dollars in 2021.</p>

8.1.8 Case 8 - Hirotec

Case Name	HIROTEC
Author	Stephen J. Ezell, Robert D. Atkinson, Dr. Inchul Kim, And Jeahan Cho
Industry	Automotive OEMs
Scale	MNCs
Status Quo	Instead of doing preventive maintenance they focused on reactive maintenance, this resulted in unneeded costs and downtime of production facilities.
Trigger Points	The cost of unplanned downtime for automotive OEMs is staggering, estimated at \$1.3 million per hour, or \$361 per second. As Justin Hester, a Senior Researcher at HIROTEC’s IoT Laboratory, observes, “If it takes a 3 minute phone call to report an issue, you’ve lost \$70,000 just telling someone you have a problem.” The costs of this downtime resulted in an urgency to change
Strategic Initiatives	To address a pattern of “reactive maintenance,” HIROTEC sought to develop a competitive strategy to capitalise on the potential benefits of the Internet of Things.
Planning, Delegation and Execution	During the implementation of this transformation they decided to use a pilot to verify their hypotheses.
Training and Change Management	HIROTEC first IoT enabled and then captured and analysed data from eight CNC machines at its Detroit, Michigan plant. It then leveraged the IoT platform to perform remote visualisation of an automated exhaust-system inspection line, sensor-enabling inspection robots, force sensors, laser measurement devices, and cameras in order to perform real-time visualisation and generate automatic, paperless reports for the entire production line of an automobile door production facility
Challenges, Roadblocks	Technical challenge of installing and monitoring IoT based

	solutions in a predominantly manual process.
Evaluation and Feedback	The pilot run offered sufficient time to HIROTEC to adjust the solution it was offering.
Impact Assessment	The implementation gave HIROTEC real-time visibility into its business operations and will enable it going forward to leverage machine learning functionality to predict and prevent critical systems failures. HIROTEC reports it has virtually eliminated time devoted to manual inspection of production systems, freeing up workers for more productive, higher-value-added assignments.

8.1.9 Case 9 - Al-Rumman Pharma

Case Name	Al-Rumman Pharma
Author	Mohammad Rishad Faridi, Azam Malik
Industry	Pharmaceutical
Scale	SME
Status Quo	Al-Rumman Pharma traditionally is a family owned enterprise with a focus on relationship building and doing business in a conventional way. They were not used to operating digitally.
Trigger Points	Al-Rumman Pharma aims to bridge the gap between demand and supply by ensuring the supply of essential medication of all types in the Middle East and North African (MENA) region. They have a competitive advantage of technical and scientific solutions at each level to add value for the customer in enhancing the lifelong business relationship
Strategic Initiatives	<ol style="list-style-type: none"> 1. Need to establish a baseline for their people, tools and processes so that the right tools are adopted for training. 2. Deciding the trade-off between firm investment or outsourcing for digital transformation and establishing lean management and agile principles. 3. Collaborative Planning, Forecasting and Replenishment (CPFR) analysis of who are the key suppliers through performance

	management.
Planning, Delegation and Execution	<ol style="list-style-type: none"> 1. Vision: Achieve prosperity in business in proprietary generic products motivated by innovative technologies with a robust presence in emerging markets 2. Values: Caring for human life. Putting the patient at the forefront of ethical commitment with transparency in all aspects of the business 3. Focus: Become an esteemed source for supplying quality generic medicines, active pharmaceutical ingredient (API), ready-to-fill pellets, ready-to-compress granules and provide a high standard of scientific and technological solution to pharmaceutical distributors/companies in the MENA region. Encourage capability of producing quality generic medicines at reasonable prices.
Training and Change Management	The proposals to introduce digital transformations, as well as other strategic changes would require some training and adaptation. Cost reduction exercises may contribute to some animosity initially, and therefore, continued training and transparency were required regarding these changes. Managing the change would also require careful planning and reviewing as to deal with any resistance. Time and resources may act as barriers for a smoother transition to a more modern/digital way of running the business, particularly, as the CEO insisted on having in-house advisory for change management.
Challenges, Roadblocks	<ol style="list-style-type: none"> 1. A lack of definition as to whether procurement is a tactical or strategic function. No clear definition about what role the procurement organisation plays at a corporate level. 2. Decentralisation has left the organisation with a fragmented view of what is being purchased, and by whom, leading to duplication in purchases and inefficient buying methods. 3. The ineffective use of technology has led to the creation of manual processes, which are susceptible to human error and a waste of valuable time and resources. Disparate systems are unable to communicate with each other or are not performing the function they are meant to, resulting in manual processes to “bypass the system.”
Evaluation and Feedback	Some resistance by employees to implement the strategy and adapt to a new way of working
Impact Assessment	The results are awaited.

8.1.10 Case 10 - Target

Case Name	Target Transforms for the Digital Age
Author	Harvard Business School digital initiative
Industry	E-commerce
Scale	Large Comp.
Status Quo	
	Target was using Amazon's platform for their e-commerce section. This resulted in paying a fee to the direct competitor. They were facing a hard time trying to set up their own process
Trigger Points	
	Many of the challenges that Target faces today stem from the fact that they were slow to recognize and embrace the e-commerce trend. In fact, Target’s website and fulfilment operations were managed by Amazon from 2003 to 2011, meaning that Amazon earned a commission on Target.com sales. Outsourcing those activities for so long demonstrates that Target initially viewed e-commerce as merely an ancillary service that they had to offer, not one that was worthy of significant investment. Unsurprisingly, once Target finally brought its website operations in-house in the fall of 2011 they had a lot of catching up to do. Case in point: the website crashed twice in a six-week span shortly after Target began managing it internally
Strategic Initiatives	
	Beyond the fundamental task of improving website performance, one of Target’s most significant changes has been modernising its supply chain by integrating its store and digital inventories and developing capabilities to fulfil online orders from stores. They’re rolling out a “Drive Up” service in which customers’ online orders are brought outside and loaded into their car by employees in a process that takes only about three minutes. Target also recently acquired Shipt, a delivery service company, and is using them to roll out a same-day delivery service to compete with Amazon’s Prime Now. Target is also rethinking the in-store experience for the digital age.

<p>Planning, Delegation and Execution</p>	<p>Additionally, several hundred stores are now serving as miniature fulfilment centres, shipping hundreds of orders per day to guests' homes. This means that an item that used to ship to a guest from a fulfilment centre located across the country can instead ship from a store across town. Target is also rolling out more small-format stores in cities and college campuses, providing convenient locations for both grab-and-go shopping and picking up digital orders. Having physical locations in these densely populated areas should allow them to attract younger, more digitally savvy customers. Additionally, Target has been busy improving its app to enhance in-store experiences.</p>
<p>Training and Change Management</p>	<p>Target felt the change directly, they had to cancel their agreements with Amazon and had to shift quite rapidly to their own system. In the end this work by having a clear line of communication and a step-by-step approach</p>
<p>Challenges, Roadblocks</p>	<p>Organizationally, while it seems clear that Target's top executives are fully committed to the importance of digital transformation, they could still face some challenges in making sure that employees whose responsibilities span both stores and digital sales channels are motivated to invest sufficient time/effort into digital initiatives.</p>
<p>Evaluation and Feedback</p>	<p>Target has come to embrace digital transformation, and the company's future is much more promising because of that shift. Target's former Chief Digital Officer Jason Goldberger liked to say, "Target.com is not going to beat Amazon.com."</p>
<p>Impact Assessment</p>	<p>Target has been rewarded for this transformation with strong digital results. The company has achieved at least 25% sales growth in the digital channel in each of the past four years. The company has also found that customers that shop in both stores and digital channels drive significantly more revenue and profit than other customers, further demonstrating the value of creating an environment that allows customers to shop seamlessly across all channels.</p>

8.1.11 Case 11 - Kaeser Kompressoren

Case Name	Kaeser Kompressoren
Author	Stephen J. Ezell, Robert D. Atkinson, Dr. Inchul Kim, And Jeahan Cho
Industry	Compressed air systems
Scale	SME
Status Quo	Regular air compressors without any digital tracking to intervene.
Trigger Points	Anytime a compressor goes down it ripples through customers’ production systems, grinding them to a halt.
Strategic Initiatives	Kaeser began equipping its compressed air equipment with IoT sensors that capture key environmental and performance data such as temperature, humidity, and vibration.
Planning, Delegation and Execution	With equipment continuously transmitting operational status in-real time, Kaeser conducts predictive analytics to determine whether parts might be prone to failure, and so can identify and replace faulty parts during regularly scheduled maintenance instead of after an outage has occurred.
Training and Change Management	Since the change was purely technical, there was no pressing need to practice change management for the employees. They were offered training to get used to the new systems.
Challenges, Roadblocks	The technical challenge to install and monitor sensors in all air compressors.
Evaluation and Feedback	While the ability to track the operational status of its deployed equipment has yielded substantial operating efficiencies, it’s also enabled Kaeser to launch an “air-as-a-service” business model in which customers no longer purchase Kaeser compressors but rather lease the compressors and pay for the compressed air used.

Impact Assessment	<p>Kaeser estimates this approach has resulted in a 60 percent reduction in unscheduled equipment downtime as well as an estimated annual savings of \$10 million in break-fix costs, as the company can better predict its inventory needs.</p> <p>Leasing System - This benefits Kaeser’s customers, who can shift more of their costs from capex to opex (capital to operating expenses) and also track their usage in real-time and manage their consumption more effectively. It also means customers can scale consumption up or down as the needs of their manufacturing operations change, without needing to purchase new compressor equipment. Kaeser finds that this “air-as-a-service” business model has produced a 28.5 percent reduction in compressed air usage for a representative building supplies manufacturer and produced €30,000 in annual savings for a paint production manufacturer.</p>
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8.1.12 Case 12 - Zavarovalnica Triglav

Case Name	Zavarovalnica Triglav
Author	Jure Erjavec, Anton Manfreda, Jurij Jaklič, Mojca Indihar Štemberger, Péter Fehér, Zoltán Szabó, Andrea Kő
Industry	Insurance
Scale	Large Company
Status Quo	<p>One of the two major trends that the company identifies as the most challenging is digitalization, with the second major trend being the ageing population. The company believes that digital technologies will disrupt their industry to a great extent. They identify digital transformation as one of the two major trends that are impacting their industry.</p> <p>They believe that digitalization is impacting their customers most, making them more informed and consequently more demanding. Therefore, the company tackles digitalization in their own unique way</p>

<p>Trigger Points</p>	<p>1. Their organisation has gone through organisational changes; however, they are not driven solely by digitalization. When the company started to face the question of digitalization, one of the options was to dedicate a specific team to digital transformation, however they decided against it.</p> <p>2. Their organisational structure enables them to mix different teams with employees from all three areas (products, processes and IT) and thus enabling multifunctional and flexible teams and avoiding functional silos. In this way they can involve anyone in the company to be a part of digitalization. Incentives for digitalization come mainly from the product area, but they themselves do not know how to address them and want employees from the process and IT areas to actively help them. The main challenge that they see with digitalization are people</p>
<p>Strategic Initiatives</p>	<p>Their organisational structure enables them to mix different teams with employees from all three areas (products, processes and IT) and thus enabling multifunctional and flexible teams and avoiding functional silos. In this way they can involve anyone in the company to be a part of digitalization. Incentives for digitalization come mainly from the product area, but they themselves do not know how to address them and want employees from the process and IT areas to actively help them. The main challenge that they see with digitalization are people</p>
<p>Planning, Delegation and Execution</p>	<p>The company sees digital transformation as just another component of change management. As such they do not see digitalization as something that could be isolated as an independent activity, process or a function in the company. They advocate an approach where digitalization needs to be integrated in all processes, products and services throughout the company. Digitalization should be tackled by all employees, especially the management. As such, the company does not have any direct KPIs to measure digitalization</p>
<p>Training and Change Management</p>	<p>One of the main challenges that the company is facing is dealing with linking unstructured data from different sources, where they give a big emphasis on social media and telematics. The other main challenge is building a middle layer between backend legacy</p>

	systems with frontend systems. They are also starting to implement predictive analytics. One of the potentials that they see in the future are smart contracts based on blockchain technology.
Challenges, Roadblocks	Incentives for digitalization come mainly from the product area, but they themselves do not know how to address them and want employees from the process and IT areas to actively help them. The main challenge that they see with digitalization are people.
Evaluation and Feedback	By taking use of their flexible organisational structure, they could implement the change quite easily. They already had a cross-department structure in place, they were having straight communication lines in between departments. This line of communication helped them during the transformation.
Impact Assessment	The insurance company has been present in Slovenia since the transition, starting in 1990. Currently it has 15% market share. The forecast of improving the results looks positive but will be determined shortly.

8.1.13 Case 13 - Danish Public Services

Case Name	Danish Public Services
Author	Ada Scupola
Industry	Public services
Scale	Large Company
Status Quo	Large scale digital transformation project spanning several years.
Trigger Points	Denmark is among the most digitalised countries in the world where most people have a basic understanding about digital products. The local institutions saw the future benefits of this and decided to remain a leader in digital transformation.

<p>Strategic Initiatives</p>	<ol style="list-style-type: none"> 1. The e-government strategy for 2007-2010 focused on common infrastructure and establishing new standards for the development of citizens' services and cohesion across the public sector. 2. The strategy developed in 2011-2015 again puts focus on increased digital communication and cross-agency cooperation on the public sector's digital infrastructure and shared use of data, as well as the promotion and development of shared solutions. 3. In 2013, the Danish Government, Local Government Denmark and Danish regions launched a new strategy called "Common Public Sector Strategy for Digital Welfare". The strategy has the main goal of improving the welfare of Danish society through digital solutions. 4. In 2016, the Danish government launched the strategy "A stronger and more secure digital Denmark - Digital Strategy 2016-2020" which focuses on user friendliness, growth and security.
<p>Planning, Delegation and Execution</p>	<p>The overall digital agendas formulated at state level have given rise through the years to spin off strategies focusing and addressing specific elements of the overall digital agenda. Since the very beginning of the digitalisation plan in Denmark, broadband goals and policies have been linked to digitalisation initiatives and have been supported by a number of political initiatives both at central government, regional and municipality level aiming at nation-wide fixed and mobile broadband coverage.</p> <p>Furthermore, the planning and delegation of this digital transformation has been carried out according to a strict planning as can be seen in the section "strategic initiatives". By following this planning a gradual and structured transformation got in place.</p>
<p>Training and Change Management</p>	<p>The Danish public sector is characterised by a high level of decentralisation. The public administration is divided into three levels, state, regions and municipalities, which collaborate closely through the tasks and obligations laid down in the legislation adopted by the Danish Parliament. Traditionally, the three levels of government, Danish Government, Local Government Denmark and Danish Regions have collaborated since the beginning in developing and implementing the e-government policies and strategies. Their</p>

	work has been then accomplished, supported and coordinated through governmental agencies under the umbrella of different ministries.
Challenges, Roadblocks	For example, according to the European Commission, Denmark has the goal of making 100 Mbps download and 30 Mbps upload speeds available for all households and businesses by 2020. The broadband strategy contains initiatives concerning framework conditions for operators, municipalities and regions as well as consumer related issues. These initiatives create a support base among people to adopt the new technologies.
Evaluation and Feedback	The initiatives taken by the Danish government resulted in a support base among residents for this digital transformation. The fact that they gradually and methodically carried out this process, resulted in a streamlined transformation.
Impact Assessment	Denmark belongs to the high-performing cluster of countries and is a leader in digitization in the world. Denmark together with Sweden, Finland, and the Netherlands have the most advanced digital economies, followed by Luxembourg, Ireland, the UK, Belgium and Estonia. In 2018, Denmark made progress in most DESI dimensions, with the exception of Integration of Digital Technology.

8.1.14 Case 14 - Hummel

Case Name	Hummel's Digital Transformation. Toward Omnichannel Retailing: Key Lessons Learned
Author	Rina Hansen, Siew Kien Sia
Industry	Retail
Scale	Large Company
Status Quo	Hummel was selling clothes in traditional clothing stores without an online option before 2005.

<p>Trigger Points</p>	<p>Following the e-commerce boom, Hummel began selling to online retailers in 2005. At the same time, the company’s traditional distributors and licensed partners were also scrambling to create web storefronts to sell their offerings online. This resulted in Hummel having a fragmented online presence, with many different Hummel websites (launched by partners and distributors in various countries) and inconsistent brand expressions online (Hummel logos, product packshots, still or moving image of a product). Visitors would get a different online brand experience depending on whether they visited a local Spanish, Japanese, American or German website.</p>
<p>Strategic Initiatives</p>	<ol style="list-style-type: none"> 1. Aligning online branding globally 2. Enhancing e-commerce support for B2B partners 3. Building the omnichannel customer community 4. Complementing the physical store experience.
<p>Planning, Delegation and Execution</p>	<p>Acutely aware of the risk of upsetting the company’s traditional wholesale B2B distribution channel, Hummel built its omnichannel strategy around its B2B network of distributors, licensed partners, and online and offline retailers. Its primary focus was to strengthen and support the B2B channel partners. Despite various suggestions to grow its business-to-consumer (B2C) e-commerce, Hummel repeatedly resisted aggressive direct selling to end-customers.</p>
<p>Training and Change Management</p>	<p>Beyond the tighter integration required between Hummel’s websites and the back-end ERP system for its B2B and B2C e-commerce, there were also issues related to the IT infrastructure, which needed to support a new set of “rich” product data. A new Product Image Management (PIM) system was built as a data hub that could import product data not only from the ERP system but also from various other social media platforms. This database was also connected to the Hummel websites. However, the technical capabilities required were not readily available in-house. Hummel therefore decided to acquire these capabilities from external e-commerce vendors. In addition, a consultant was hired who worked in-house two to three days a week to help with the development and integration of systems from third-party vendors. The arrangement also offered flexibility because Hummel learned that it was not possible to</p>

	source all digital capabilities to support its omnichannel strategy from a single e-commerce vendor. With the help of the IT vendors, the Digital Department became responsible for the PIM system, content management system and related social media integration.
Challenges, Roadblocks	Incorporating all partners and leveraging their capabilities in building the omnichannel retail strategy.
Evaluation and Feedback	Constant checks of the ERP implementation to ensure steady flow of data.
Impact Assessment	Progress with Hummel’s omnichannel strategy was seen in the increase in total sales from \$170 million in 2010 to \$240 million in 2013. In particular, sales through online channels grew from 5% of total turnover in 2010 to 21% in 2013 (11% from the B2B e-commerce platform and 10% from online retailers). Moreover, sales profitability also improved, because of the lower discount online retailers received compared to the large retail chains. Rapid growth of online sales was expected to continue over the next five years.

8.1.15 Case 15 - Haier

Case Name	Haier's digital transformation in Digital Transformation of Manufacturing Enterprises
Author	Haijia Lia, Cailin Yang
Industry	Electronics
Scale	MNCs
Status Quo	Haier was already operating in a good way, but felt to go for a change to keep up with the competition.
Trigger Points	As a traditional manufacturing enterprise spearheading the efforts of “intelligent manufacturing” in China, Haier Group has actively integrated itself into the digital innovation under the Internet surge in the new era, and achieved fruitful reform outcomes. In January 2015, the refrigerator Internet plant located in Shenyang caused a

	<p>great sensation among all walks of life. After that, “Internet Plus” and “Made in China 2025” have been subsequently put forward as national policies.</p>
Strategic Initiatives	<p>Digital innovation of Haier Group consists of three parts. First, stick to the operation principle that is oriented towards user demand. Traditionally, plants will first receive user information, which is then delivered to every link layer by layer. The information delivery is long in cycle and inefficient, which can hardly satisfy the quickly-changing user demand.</p> <p>Second, create a new-type interaction and communication platform. The Internet plant created by Haier Group is a cyberspace for user interaction. In Haier’s ecosphere, there are small-and micro-sized enterprises, employees, makers, resources, suppliers, equipment manufacturers, marketers, consumers, media, etc. Thanks to Haier’s efforts, the enterprise relations which were enclosed and unsustainable and involved in a game in the past have been transformed into an ecosphere which is driven by user demands and seeks win-win cooperation.</p> <p>Third, keep on innovation to achieve the best products. On the one hand, Haier Group has been actively promoting its product intelligentization, particularly strengthening the product functions, such as automatic sensing, judgement and learning. On the other hand, Haier Group should head towards digitalization, which can provide enterprises with big data from the user terminal and manufacturing terminal. Through the big data, Haier can share and learn data on a real-time basis, and fully dig, analyse and use data</p>
Planning, Delegation and Execution	<p>Haier started this transformation in-time to go for a gradual approach. They also put power towards creating a support base among employees for this change. They involved employees from several departments to get this change started and to get their ideas involved in the transformation.</p>
Training and Change Management	<p>Haier appointed one executive to oversee the implementation of this transformation. The executive got a lot of freedom to determine his own team and way to implement this. Haier stated that giving</p>

	people freedom to carry out a change, helps to speed up the process in comparison to protocols etc.
Challenges, Roadblocks	The pace of the transformation resulted in a lot of changes at the same time. Sometimes this pace caused confusion among employees and they had to take some steps back in order to get everyone aligned.
Evaluation and Feedback	The implementation of these digital initiatives resulted in setting the standards for the chinese manufacturing industry for the upcoming years, haier was even recognized for setting the standard for the "Made in China 2025" campaign.
Impact Assessment	Haier Group immediately sublimated “intelligent manufacturing” as an important development strategy and extended the connotation of the strategy from “intelligent household” to the Internet plant system. The frontend of intelligent manufacturing is the family. Consumers can put forward personalised demands according to different living scenarios. At the same time, the Internet plant can learn user demands through the port to realise large-scale product customization. In December 2016, the “Internet Plant Ecosphere Construction Based on the Optimal User Experience throughout the Process” of Haier Group won the first prize of the “23rd National Enterprise Management Modernization Innovation Achievements”

8.1.16 Case 16 - Haribo

Case Name	Haribo ERP's implementation
Author	Bill Baumann
Industry	Confectionary
Scale	MNCs
Status Quo	Haribo was not keeping track of their production using cloud services, this resulted in a lot of calls in between departments to check status.

Trigger Points	In 2018, the brand kicked off a major SAP ERP implementation meant to streamline its production and modernise its outdated goods management system. However, very shortly after the launch, disruptions began to occur. It wasn't long until production and deliveries stalled, followed by a sales decline.
Strategic Initiatives	It's only logical to test before you go live with your new ERP system and make sure it works as expected. In addition to performing checks in a designated testing environment, it is recommended to conduct the pilot testing to simulate real-life operations. Various quality controls, including supply chain concerns can be checked as these tests are performed. This way, major problems can be identified before the go-live date and necessary steps can be taken to reverse them. For Haribo to only discover their issues after their rollout suggests that there could have been major flaws in its ERP system testing strategy.
Planning, Delegation and Execution	Before the transition, many of the systems used in Haribo's regional branches dated back to the 1980s. Surely, a new ERP system would be a welcome change. Unfortunately, this wasn't the case due to a lack of planning and the significant amount of manual effort typically required to prepare business processes and workflows for new software.
Training and Change Management	<p>Lack of leadership: The impetus behind Haribo's SAP implementation was the demand of the brand to expand its international manufacturing presence and grow its supply chain operations. In hindsight, they found that the features built into the S/4HANA platform might not have been fully capable of supporting that vision. During the ERP selection process, it is recommended to first define organisational goals.</p> <p>Lack of support base: The importance of executives buying into the transformation projects can not be understated when it comes to solidifying the long-term success of an ERP project. An engaged ERP project team can help govern and lead efforts on the ground.</p> <p>Both types of support are needed to propel the project forward. If</p>

	Haribo had this type of backing, it's possible that many of its SAP transformation problems could have been less consequential.
Challenges, Roadblocks	Upon going live with their SAP implementation, Haribo discovered that their business processes were broken and incompatible with the software. This led to major operational distress, much of which should have been avoidable.
Evaluation and Feedback	<p>It's possible that Haribo did dedicate some attention to business process management, but they may have failed to dedicate enough attention, or they focused on it too late in the game. Instead of being an afterthought done weeks past your rollout, it should be one of the first steps in your ERP project.</p> <p>If Haribo had developed a risk mitigation plan to address supply chain setbacks, it may have been able to weather a shaky initial rollout. These aren't uncommon or limited to big brands. Any company is liable to experience these issues, but those who factor in controls for such interruptions are often strong enough to overcome them.</p>
Impact Assessment	Almost immediately, issues with the platform caused hiccups in Haribo's supply chain operations. Production constraints led to missed supermarket deliveries, and by the end of the year, the company experienced a 25% decline in sales for 2018.