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Roadmap to Digital Transformation

Case: Huld Ltd

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Abstract

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Today, digital transformation is everywhere. The digital opportunities are evolving faster than the pace of transformation in the organizations. To leverage these opportunities quicker and to overcome the possible challenges faster than the competitors, a growing number of organizations across different industries have systematically started to enhance their culture, operations, and capabilities for the workforce of the future. This phenomenon is called acceleration of digital transformation.

This thesis focuses on determining clear path to the acceleration of digital transformation for the case company Huld Ltd by creating a roadmap that can be part of its growth strategy.

This study utilizes the Applied action research along with qualitative research method, gathering qualitative data via questionnaires, interviews, publications, and other online channels analysis to find the best-fit solution to overcome the organization business challenges and reach its digital ambition.

By assessing the current state of the existing digital transformation maturity of the case company, the study synthesizes the key areas to focus on in its digital transformation journey. A far more effective way for achieving better business outcomes is looking at the best practices the leaders as Accenture, Boston Consulting Group (BCG) and McKinsey operate in accelerating digital transformation across their organization and to introduce their ways of working into the case company.

As the outcome, this study suggests clear and effective ways to overcome the barriers on the path to digital acceleration when building a digital transformation roadmap. The roadmap defines three major elements needed to reach the digital transformation acceleration: implementing a systematic approach in decision making, building digital capabilities for the workforce of the future, and creating an agile culture and a new way of working. By doing these, the case company can better deliver relevant business outcomes to customers with fast payback and enhance employee performance.

Keywords: Digital Transformation, Roadmap, Operations Optimization, Digital Talent, Dynamic Organization

Preface

The journey of this thesis topic started on 4th of April, 2021, when the COE Director, Riku Rennieke had introduced us the COE strategy as part of the new organizational change using the Center Of Excellence (COE) model. Along with presenting the COE mission and steps for reaching the COE goals, Riku empowered us to come up with ideas and work together to improve the processes going forwards.

At that time, neither my MBA degree program nor my Master's thesis work started. But to make sure we are setting up and running a successful Center of Excellence to reach the goals efficiently, I have started to better prepare myself for the new Huld leader role and anticipating the challenges ahead.

This Thesis develops a roadmap to plan out company's digital strategy for 2-3 years into the future and serve as a baseline for similar organizations willing to adopt digital transformation as part of their business strategy.

It was very enjoyable for me to have a supportive environment at Huld, the company where I have been working for the past 10 years. I appreciate my colleagues' interest in my work and their support, for which I would like to thank them very much. In particular, Riku Rennieke (Embedded Solutions COE Director) and Mikko With (COO) have actively supported my research. I wish to thank them both.

I would like to thank my thesis advisor, Antti Hovi, Senior Lecturer at Metropolia University of Applied Sciences, for the excellent guidance and support during the process. I carefully chose you to be my supervisor because I knew you would provide me the opportunity to embrace new challenges. This has helped me gain the right perspective and grow as an expert, for which I am very grateful.

A special mention goes to Zinaida Grabovskaia as a second reader of this thesis and a great motivator. I am indebted to her for the insightful comments that helped me improve this thesis.

Finally, I want to thank my husband Christian and my daughter Sofia for being there for me. I would also like to thank you, my reader. I hope you enjoy reading this thesis.

Violeta Tudose

Espoo

17 November 2022

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Glossary

- BU Business Unit. “An organizational structure such as a department or team that produces revenues and is responsible for costs.” (Garbelli, 2013).
- CoE Center of Excellence. “An organization unit that embodies a set of capabilities that has been explicitly recognized by the firm as an important source of value creation.” (Frost et al., 2002).
- CX Customer Experience. “A totality of cognitive, affective, sensory, and behavioral consumer responses during all stages of the consumption process including pre-purchase, consumption, and post-purchase stages.” (Kolekar, 2021).
- EX Employee Experience. “Companies and their people working together to create personalized, authentic experiences that ignite passion and tap into purpose to strengthen individual, team, and company performance.” (Dhiandra et al., 2018).

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1 Introduction

Today, digital transformation is everywhere. A growing number of organizations across different industries are accelerating their digital transformation not only to make their operations faster and more efficient, but to meet customer demands in a changing environment (Deloitte, 2021:4). However, large scale change is hard and digital transformation “is not just about technology” (Tabrizi, et al. 2019) or increasing efficiency in the current business. It is about transforming the customer experience and changing how to operate and deliver value to customer. Moreover, it requires clear targets for each source of value creation and to make sure the entire company shares one digital vision.

The digital opportunities are evolving faster than the pace of transformation in the organizations. McKinsey research suggests that the “digital first movers and fast followers capture more value within their industries than slower-moving companies”, taking the lead on digital transformation (Booth, et al. 2018). However, the digital transformation is a journey where the desired destination and the path are different for every company. From Gartner’s perspective (Gartner, 2021:2), the transformation journey is taking large organizations at least twice as long and costly than anticipated. While McKinsey (2018) has found that less than one-third of the organizations successfully performed their digital transformation. Like on any journey, a careful planning and a well-organized process should help companies reach the destination safely and avoid back-roads and unnecessary costs.

This study aims to analyse the opportunities digital transformation can bring to the case organization and how this can achieve the goals as part of its growth strategy by building a digital transformation roadmap.

1.1 Business Context

The case organization of this thesis is Huld, a European technology design company established on February 2020 as a result of the merger between RD Velho and Space Systems Finland. The company has currently a turnover of EUR 35 million euros and 450 employees working in 12 offices all around in Finland and Central Europe (the Czech Republic).

Presently, Huld is in a development runaway with leading consultancy players in various industries. It offers a unique combination of software design solutions and development services to its customers in a variety of business areas: Machines & Vehicles, Intelligent Devices, Digital Innovations, Space and Defence. The company's ambition is to become one of the leading technology companies in Europe to create meaningful digital solutions in the not-too-distant future.

1.2 Business Challenge, Objective and Outcome

As a post-merger strategy, starting March 2021, Huld has implemented an organizational change using the center of excellence (CoE) model to guarantee the company's growth and development. Building a successful CoE might go through challenges in providing customized solutions for the business needs at the right time. One major challenge is to master the digital transformation to accelerate the business.

The objective of this study is *to create a roadmap as a strategic plan to accelerate the digital transformation within Centers of Excellence.*

The outcome of this study is the roadmap for acceleration of digital transformation within Centers of Excellence in Huld. A digital transformation roadmap will plan out Huld's digital strategy for 1-2 year into the future and provide a baseline for other organizations willing to adopt digital transformation as part of their strategy. The roadmap will allow the case organization to take the right steps to overcome the barriers to digital transformation, imagine the future and continuously innovate to stay ahead of changes.

1.3 Thesis Outline

The scope of this thesis is to create a roadmap for accelerating the digital transformation towards achieving Huld's vision of future state. This will help Huld better understand the path its business is on, where to focus the efforts and how to overcome the roadblocks of digital transformation.

The thesis uses Applied action research approach linked with a real business problem and qualitative research methods to identify key drivers that will be important to take into consideration in the building of the digital transformation roadmap. The data collection derives from the stakeholders' feedback and interviews within the case organization. The

collected data will provide the accurate insights to acknowledge the current challenges and identify the targets. Thus, this thesis focuses on finding the existing barriers and defining the major steps in accelerating the digital transformation.

The thesis is organized in seven sections. Section 1 is the Introduction providing background information about the case company and describing the business challenge, objective, and the outcome of this study. Section 2 explains and justifies the research approach and data collection methods involved in this study. Section 3 provides the results of the current state analysis of the digital transformation, the existing barriers, and visions for future solutions. Section 4 focuses on finding the relevant existing knowledge from literature and business industry best practice. Section 5 contains the proposal of the digital transformation roadmap for case company. Section 6 reports on the validation of the proposal with the key stakeholders and the final proposal after their evaluation. Finally, Section 7 summarizes the findings, managerial implications, thesis evaluation and contribution to the case company.

1.4 Key Concepts

Here is a list of some key terms definitions that are used in this research.

BCG's Digital Acceleration Index (DAI) is a diagnostic tool that assesses the company's digital maturity across seven dimensions: (1) the business strategy driven by digital, (2) data and technology, (3) operations, (4) customer experience, (5) new digital services and business models, (6) digital talent and (7) dynamic organization. (BCG, 2020).

Digital maturity is a "key predictor of success for companies launching a digital transformation". (BCG, 2020).

Digital Transformation (DT or DX) is the "adoption of digital technology" by a company "to improve business processes, value for customers and innovation". (Shaban, 2022).

Digitalization refers to using "digital technologies to change a business model and provide new revenue and value producing opportunities". (Gartner, 2022).

2 Method and Material

This section describes the methods used to undertake the research. First, the research method is described in depth covering the chosen research approach to solve the problem. Second, the research design is presented including the key elements of the Thesis and the steps to reach the proposal. Next, the data collection and analysis techniques are provided, gathering and processing different types of data to build the optimal solution.

2.1 Research Approach

The research approaches are the methods and procedures that comprise the steps from broad assumptions to detailed methods of data collection, analysis and interpretation. (Creswell et al., 2018: 40).

First, a research approach can either be applied (or action) or basic, depending on the purpose or utility. The applied research aims at finding a solution for an immediate problem not just gathering knowledge as aimed by the basic research (Kothari 2004: 3-8). It combines the research and development in a cyclic process which typically relates to continuous enhancement and organization improvements (Kananen, 2013: 20).

Second, the choice of a research method is made between, qualitative and quantitative methods. Quantitative research methods are used for statistical or numerical analysis of data collected through survey and questionnaires. The qualitative research methods are focused on collecting and analysing non-numerical data to understand a phenomenon, its structure, factors and causal interrelationship between them (Kananen, 2013: 31). In qualitative research, the researcher aims to establish the meaning of phenomenon from the view of participants (Creswell et al. 2018: 54). However, qualitative methods for data collection and analysis often involve observations, focus groups, content analysis using questionnaires or structured interviews for data collection. Qualitative research is commonly conducted on one or selected number of individuals or other units of analysis who have all experienced the phenomenon (Creswell et al., 2018: 50).

The study itself starts with the analysis of data collection from conducting surveys and interviews with the organization stakeholders. Therefore, a qualitative research method

is used for identifying the existing barriers and visions to problem solving. The study also analyses the existing literature and best practices in business in order to find ideas for the problem solution. Furthermore, the Applied action research (Kananen 2013: 20-23) is adopted through the application of theory into practice to address specific processes or business situation, conducted to solve a real business problem.

The design research combines the development and research producing practical solutions for the organization. Using the applied action research, the thesis aims to improve the knowledge about certain problem and does not have the goal to implement this knowledge.

To summarize, this thesis utilizes the Applied action research along with qualitative research method, gathering qualitative data via interviews, articles, blogs and other online channels analysis, and questionnaires to find the best-fit solution to an organization business problem.

2.2 Research Design

This study is planned to be conducted according to the Applied action research design as illustrated in Figure 1 below.

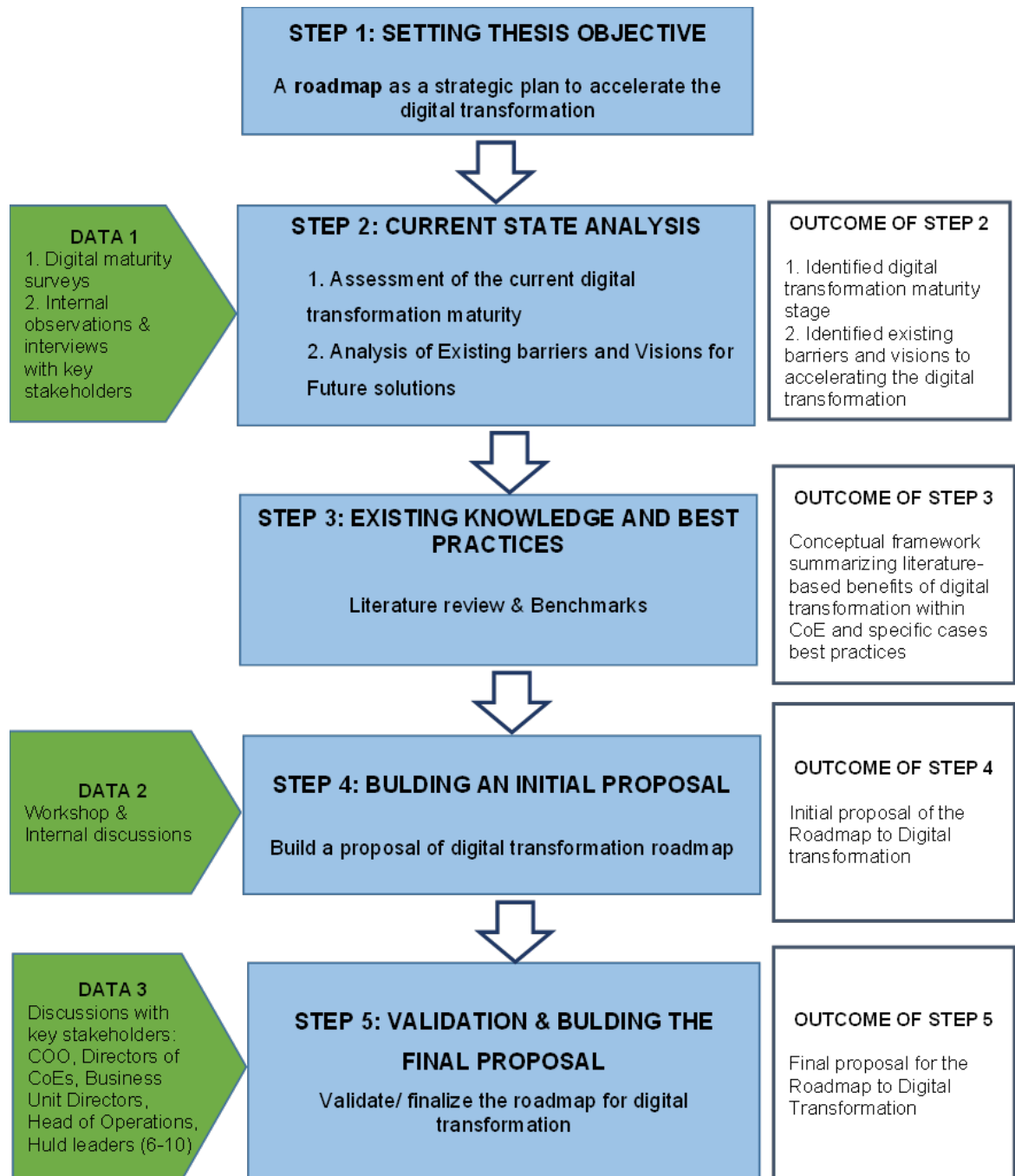


Figure 1 Research design of this study.

As seen from Figure 1, the study contains five phases. The first phase is setting the objective. The second phase consists of the current state analysis. The current state analysis focuses on identifying the digital transformation maturity stage, the existing barriers of digital transformation and benefits of its acceleration. Moreover, it presents the analysis of existing visions for future solutions. The data collection (Data 1) is based on the collected digital maturity surveys, participant observations, and interviews with organization's stakeholders, gathering opinions from individual experts and key stakeholders. The responses will provide insights into the state of the digital transformation, give a general understanding of where the organization is now and looking into the future, attempting to visualize where it needs to be in two or three years from now.

Next, the third phase is focused on available literature and best practice. Literature and best practice search aim at identifying the selected relevant concepts, tools, theory, and best practice elements that could help to shape the roadmap for digital transformation based on existing knowledge.

The next phase is building the initial proposal. In this phase, the proposal is built based on the second data collection point (Data 2) that involves internal interviews and discussions as well as the outcomes from current state analysis and conceptual framework (from the fourth phase).

Finally, the proposal is validated with the executive and top management. First part of the validation is to use it in practice as a short- and long-term action plan at the case company. Second validation is done by presenting the proposal to all key stakeholders to assess it and get their feedback (Data 3). Based on these findings, recommendations for putting the roadmap into practice will be suggested (in Section 6.3).

2.3 Data Collection and Analysis

This study explores a variety of data sources, and the data was collected in three rounds. Table 1 provides details of Data collections 1-3 used in this study.

Table 1. Details of Data collections 1-3 used in this study.

	1. TOPIC, DESCRIPTION	2. DATA SOURCES, DATA TYPE	3. PARTICIPANT, ROLE	4. DATE, LENGTH	5. OUTCOME
DATA 1 for Current state analysis	Customer needs analysis	Questionnaire / survey with Business Units & Sales stakeholders	Business Units & Sales stakeholders (14 respondents)	MARCH / APRIL 2022	Written results: Customer hidden needs & expectations
	Strengths & Weaknesses of current capabilities and value creation	Surveys with internal stakeholder / interviews	Top Management (6 C-level executive respondents), Center of Excellence Directors (3 respondents)	MARCH / APRIL 2022	Field notes, Presentation slides: Barriers and visions to digital transformation
	Strengths & Weaknesses of current capabilities and adoption of digital technology	Interviews / Questionnaire	Head of Operations Team leaders, Competence technical leads (10 respondents)	MAY/ JUNE 2022	Filed notes, written results: Barriers and visions to digital transformation, written results
DATA 2 for Building the Proposal	Defining Roadmap elements	Workshop/ Teams meeting	Embedded Solutions Center of Excellence Director, Head of Operations, Team leaders, Competence technical leads (10-15)	AUGUST/ SEPTEMBER 2022	Presentation slides, field notes: Initial proposal for the digital transformation roadmap
DATA 3 for Evaluation of the Proposal (via Validation)	Validation, evaluation of the Proposal	Group interview/ Final presentation	Center of Excellence Directors, Team leaders, Competence leads (10-15)	OCTOBER / NOVEMBER 2022	Presentation slides, field notes: Final proposal for the digital transformation roadmap

As shown in Table 1, data in this research was gathered and analysed in three rounds. The first round of data collection was organized in the current state analysis phase. Data 1 was collected from the interviews and questionnaires conducted among three groups of stakeholders. The first group consists of 9 top management respondents that took a first questionnaire, then the second group includes 14 respondents from Business Units & Sales that better understand the customer's needs and the third group includes 10 competence leads and team leaders from COEs. The first group took the questionnaire presented in Appendix 1, while the second and the third groups took the questionnaires presented in Appendix 3 and 4.

In the second round, the suggestions from the Center of Excellence leaders were gathered into Data 2 and analysed to define the roadmap items and requirements. This data included interviews, workshops, and one-to-one meetings.

In the third round, Data 3 was collected when performing the validation of the initial proposal. Data 3 consisted in the recommendations provided by the engaged key stakeholders.

In this research, the interviews and workshops made the primary methods of data collection. The interviews were conducted face-to-face at the company premises or online using interviews questionnaire forms. The responses to the questionnaires can be found in Appendices 2, 3 and 4. The content of collected data was structured and analyzed using Thematic analysis.

The current state analysis dealt with a large amount of data. The findings derived from the current state analysis are examined in Section 3 below.

3 Current State Analysis of Digital Transformation

This section describes and assesses the current state of the existing digital transformation maturity of case company.

3.1 Overview of the Current State Analysis

The focus of the current state analysis was on (1) understanding where the company is in its digital transformation journey and how the case company embraces the digital transformation, followed by (2) the analysis of the organization's digital transformation maturity to provide actionable insights to identify the digital acceleration index. The digital acceleration index (DAI) enables company to evaluate and assess its digital strength and weaknesses to have a better understanding of its state of digital transformation across multiple aspects of the business. The company will also be able to identify the steps for improvements over a multi-year period.

The current state analysis followed three steps. First, it described the organization setting, so that to give extensive background to the current state analysis. Second, the data collection was conducted; third, the data analysis was conducted, and the key findings identified. The data analysis was based on BCG digital maturity model (BCG, 2020), a questionnaire-based evaluation of company's digital maturity across 36 topics or questions, grouped into seven dimensions and that categorises companies into four stages of digital maturity: digital starter, digital literate, digital performer, and leader. Figure 2 below shows the Four Stages of Digital maturity model developed by Boston Consulting Group (BCG).

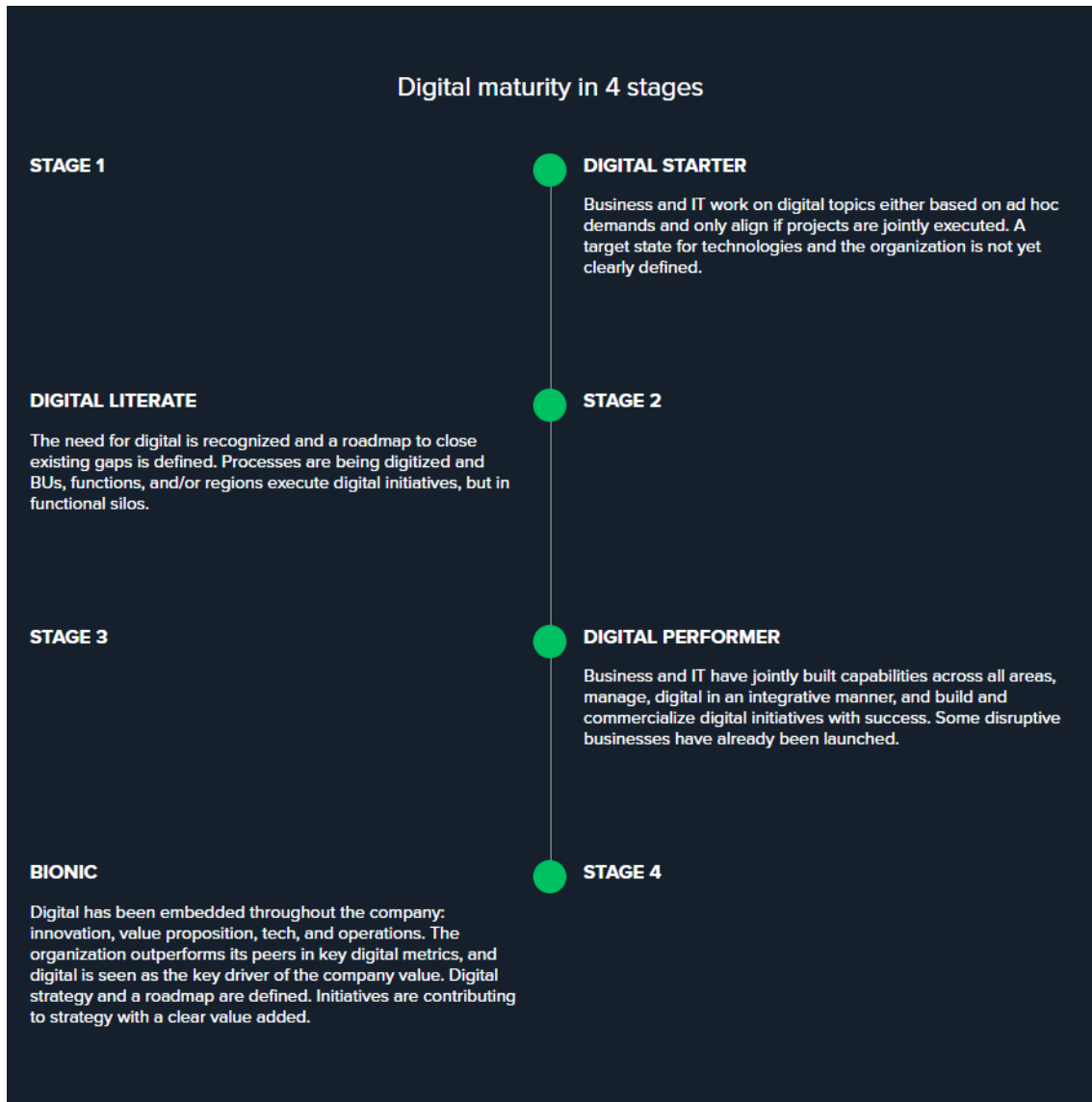


Figure 2 4 Stages of the Digital maturity model (BCG, 2020).

Each maturity stage corresponds to a detailed description of what a company should have in place in terms of business strategy driven by digital, customer experience, processes, governance, changing ways of working and technology. Table 2 below shows the stages of digital transformation maturity.

Table 2. Stages of Digital Transformation Maturity (BCG, 2020).

Starter	DAI score 0-25	Digital transformation plans are rudimentary and ad hoc.
Literate	DAI score 26-50	Digital laggards that have some digital solutions in place with the current strategic planning.
Performer	DAI score 51-75	Centers of Excellence coordinate to use digital capabilities successfully.
Leader	DAI score 76-100	Digital capabilities embedded into all functions, including innovation and R&D.

The current state analysis ends with a summary of current digital transformation maturity in the case company, visions and targeted maturity level, customers feedback analysis, and the summary of key findings from the resulted digital transformation acceleration index compared to competitors. These results will help identifying the strengths and weaknesses of the company digital transformation, as well as selected focus areas of this study.

The data collection used in the current state analysis is based on surveys and interviews conducted with the selected key stakeholders. The key stakeholders have different roles in the company and different areas of expertise. They were chosen based on their responsibilities for the key activities and involvement in the company strategy, business areas, processes, operations, or center of competency. The research is a combination of multiple surveys that have been conducted with the case company top management team leaders and competence leads, as well as interviews with COO and COE Directors. The survey is a quantitative research method comprised of questionnaires with the intention of efficient data collection from a set of respondents. The participants are advised to select the response and level that best represents the current stage of digital transformation in the organization. The data collection for the current state analysis is conducted in four steps.

First, a questionnaire with top management is conducted to identify the awareness of digital transformation opportunities and the digital strategy in place.

Second, an interview with the Chief Operating Officer. The goal with this interview is to identify the strength and weaknesses of current way of working and capabilities for the digital services provided to customers in a variety of industries and value creation.

Third, a questionnaire with all team leaders and competence technical leads is conducted to identify the state of current capabilities and adoption of digital technologies.

Fourth, a questionnaire with all Business Units managers is conducted to identify the strengths and weaknesses of current business processes and created customer value through the existing digital transformation. The results of the current state analysis are presented below.

3.2 Description of the Current Digital Transformation Journey

The description of the current digital transformation journey relies on the BCG survey that assesses the case company along seven dimensions: (1) the business strategy driven by digital, (2) data and technology, (3) operations, (4) customer experience, (5) new digital services and business models, (6) digital talent, (7) dynamic platform organization that includes organization governance, agile ways of work and digital transformation accelerator. (Figure 3)

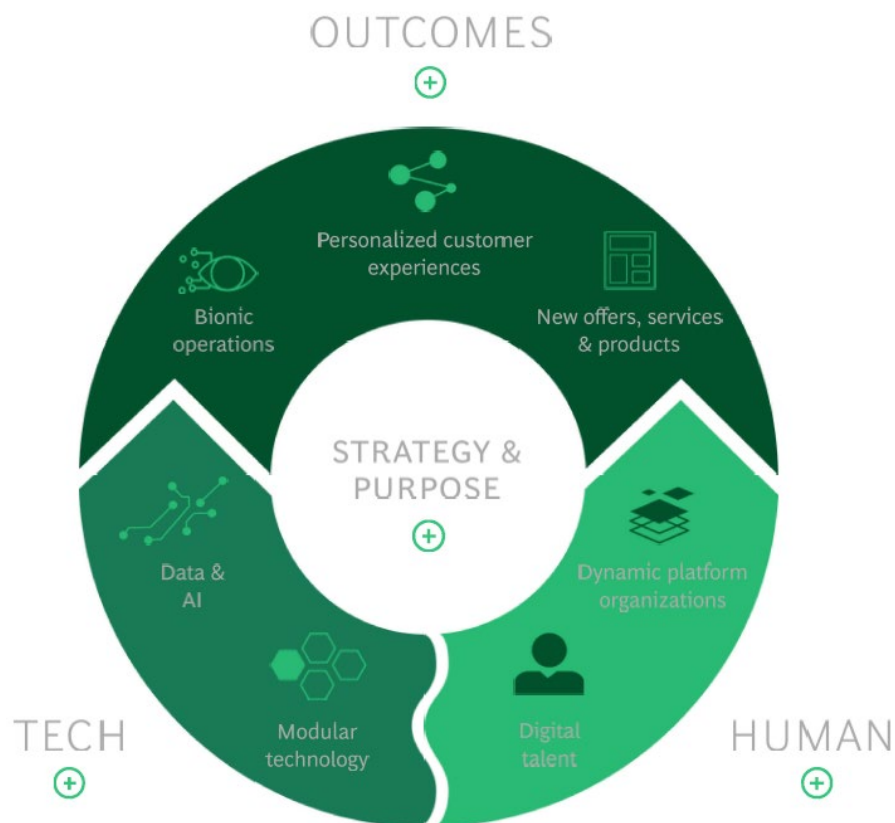


Figure 3 Digital Acceleration Index Dimensions (Source: BCG, 2020).

BCG's Digital Acceleration Index (DAI) score is based on the responses to the assessment questionnaire per dimension provided by 9 top-management respondents. For each of the 36 topics or questions, respondents choose which custom description of practices or standards best resembles the case company's current digital maturity. For all these questions, there was also a 5th option ("Don't know") that would allow the respondent to skip ahead. The average DAI Score from the 9 respondents was 34, which corresponds to stage 2, placing the case company in the "Digital Literate" category according to BCG's survey.

Investigating how does the case company manage the digital transformation journey, among all survey participants, 66% indicated that some digital initiatives are managed across BUs, functions and regions, while 11% consider there are no overarching plan and no involvement of external stakeholders.

Thus, an integrated overall digital transformation journey has not been defined yet and a roadmap has not been developed to reach company's digital ambition.

3.2.1 Business Strategy Driven by Digital

The company's ambition to be "the boldest technology and design house in the Galaxy" is understood by all parties (Business Units and Centers of Excellence) and approved by the leadership team. A global guideline (processes, responsibilities, decision-making) is established to prioritize digital strategy and monitor the digital initiatives in the Business Units.

"Everyone of us is part of Huld story. Feeling of being part of community has gone down as a result of pandemic and organization change. Also, about 25% of Huldians have started 2021 or 2022. We have house full of smart, humane and bold people. Involving more people to making Huld a better place would make a lot of sense." (COO, June 2022)

As for the digital vision, Figure 4 below shows that 11 out of 24 survey respondents from BUs and COEs indicated that the case company has a clearly defined digital vision, while 8 respondents disagree or strongly disagree with that.

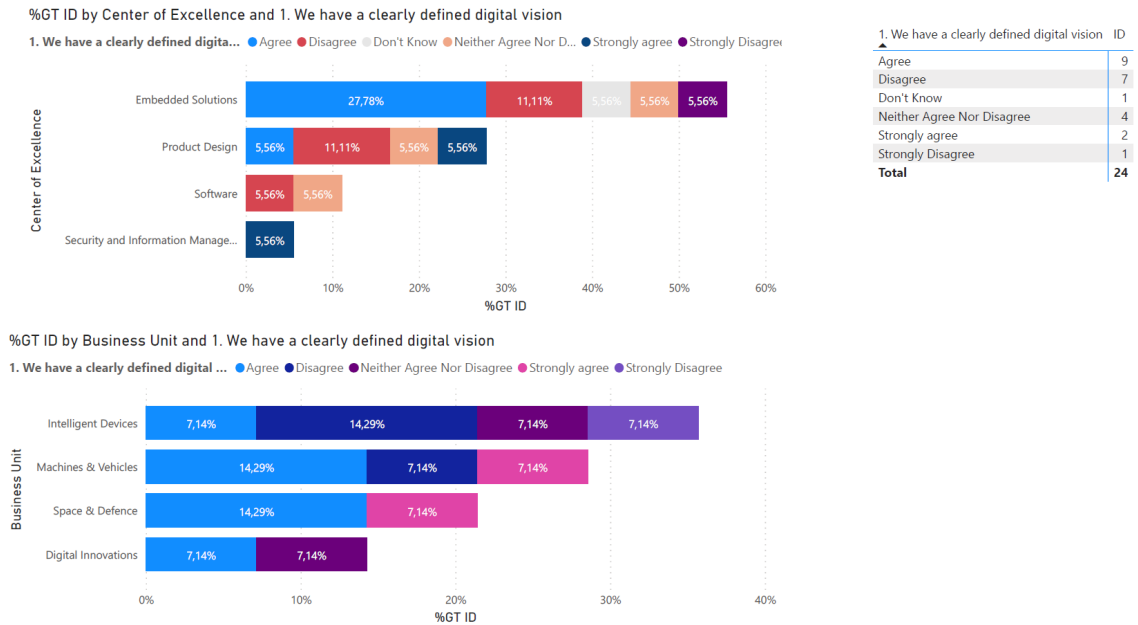


Figure 4 Digital vision among the COEs vs BUs (Results from Digital Transformation Acceleration Questionnaire, Appendix 3 and 4)

Figure 4 also indicates that 33,33% from COEs respondents disagree or strongly disagree with the statement that the case company has a clearly defined digital vision, while only half of the BUs respondents have the same opinion. These results show how the perception of digital vision to guide company’s strategy differs among the BUs and COEs respondents.

The digital strategies coexist in several functions or BUs of the company. Currently, there are 12 strategic programs, each of them has an owner, action list and targets. Some digital initiatives are managed across BUs, functions and regions but without a developed roadmap to reach the digital ambition holistically across BUs and Centers of Excellence. However, the innovation approach and roadmap across functions are still missing.

3.2.2 Leveraging the Power of Data and Technology

The case company understands the value that data can create, and a structured collection of use cases is developed but not comprehensive roadmap for implementation is built. The company has also an organizational structure in place to govern data and analytics. Data is managed by IT with input from business without existing a fully

functional data organization in a hub-and-spoke operational model covering the entire organization. As one of the C-level interviewees expressed:

“It is important to somehow identify the tools for customers since they benefit of the change if we do such digital change.” (COO, June 2022)

The current data platform uses a mix of traditional technologies and analytics are mainly descriptive and run primarily through packaged BI and database tools. Analytical resources are disseminated across the organization. The company also has awareness of major use cases enabled by AI on management level, job profiles (e.g. data scientists); they are defined with explicit AI and machine learning skills demand. The case company is active participant on the Internet of Things (IoT) ecosystem as part of customers’ business. The organization has key role to provide full value of IoT, including safety analysis, and HW/SW skills aligned with the current technology and implemented use cases.

Finally, the company also has a digital security program in place, headed by a Chief Security Officer for the existing business security services. It aligns security demands to fit customers business needs, neutrally to their industry, company maturity and size.

3.2.3 Operations

The Next Gen Tech operating model and resources started getting aligned to business needs building expertise.

Digital delivery (DevOps) for development within the customer projects has clear ownership with clear continuous development processes for all stages of the software development life cycle. Majority of respondents answered to DAI survey that outdated systems are getting replaced and first steps are taken to optimize the core service processes. As for the digital technologies deployed across the organization, the respondents to DAI survey are seeing low degree of digitization for strategic processes, such as decision-making and there is no advanced analytics approach for decision support. As one of the C-level interviewees expressed:

“We have tons of data and a lot of tools, we are doing pretty much digital, but when we got to the decision making and how to do things, it becomes

important to do it more systematic and extend the digitalization.” (COO, June 2022)

The need of a systematic decision-making approach to optimize the core service processes and faster respond to changing customer demands is indicated in Figure 5 below.

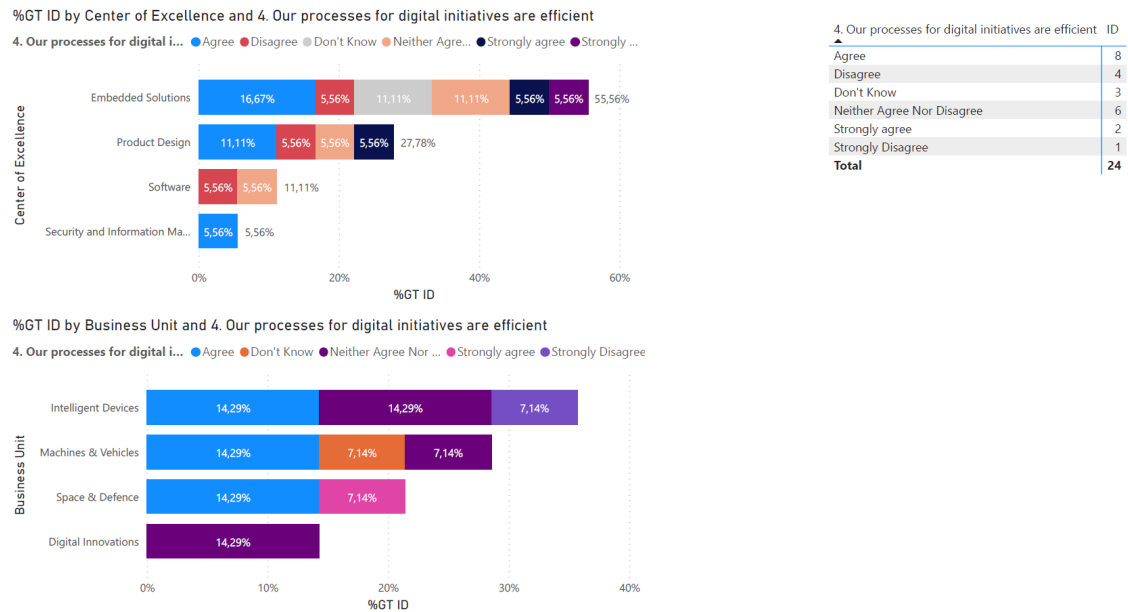


Figure 5 The decision-making processes to centralize digital initiatives among the COEs vs BUs (Results from Digital Transformation Acceleration Questionnaire, Appendix 3 and 4)

As seen in Figure 5, 10 out of 24 respondents appreciated that the case company’s processes are efficient, while 5 respondents disagree and 6 neither agree nor disagree with this statement. Furthermore, 35,72% of BUs respondents are more neutral than the COEs respondents from that only 22,24% are not having strong thoughts about the efficiency of case company’s processes.

The case company exploits the benefits of some process automation in reporting the working hours and invoices, but there are not highly automated with intelligent digital solutions in place for all operations planning. Presently, customer experience is not leveraged as input for feedback loop into processes. Furthermore, the interviewed key stakeholders consider that there is a low degree of digitalization in front and back-office processes and many tasks remain heavily manual.

3.2.4 Personalized Customer Experience

The organization’s agile development processes and data are integrated to support customer’s digital processes and improve the research and product (R&D) development. It runs projects to speed up R&D (e.g. 3D printing, Additive Manufacturing) building capabilities to become more innovative.

Today, customers expect personalized content in relation to their business, their digital journey dictating the service provider strategy. Figure 6 below indicates that 13 out of 24 respondents agree or strongly agree with the statement that the case company strives for a competitive advantage via digitized customer journey.

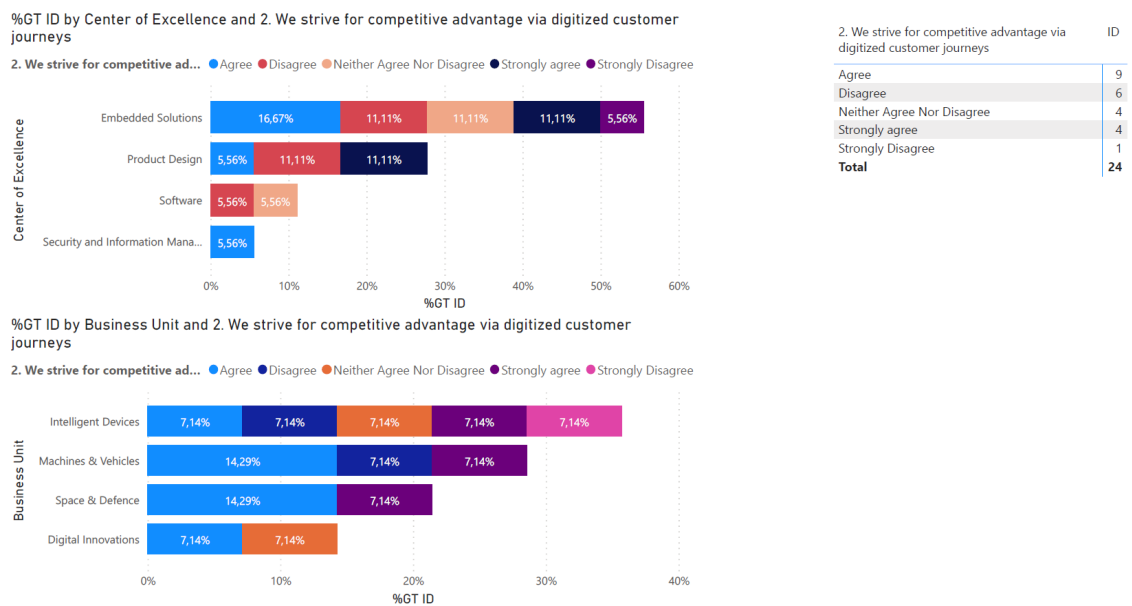


Figure 6 Competitive advantage via digitized customer journey (Results from Digital Transformation Acceleration Questionnaire, Appendix 3 and 4)

At the same time, 7 respondents disagree, while 4 neither agree not disagree with the statement that the customer experience brings competitive advantage and create value for the case company.

The BUs communicate and engage with customers, both online and offline, to act positively towards their business. The case company can deliver tailored experiences, but it is currently missing full analytic capabilities to support personalized experience to customers at scale. However, the company does not currently have a long-term strategy and a roadmap for it in place. The CRM data is not yet exploited to the full potential.

Overall stronger focus on processes rather than sales improvements by using digital technologies and analytics. As one of the sales managers expressed:

“We only communicate by email and phone calls; there is no digital customer experience in the modern technology.” (Sales manager, May 2022)

On the positive side, the company understands the customer (pain points and unmet needs) and work together in identifying new opportunities to reinvent customer journey and deliver differentiated customer experiences.

3.2.5 New Digital Services and Business Models

The case company is disrupting the business model and identifying new businesses on its way to profitability. The company started to complement its core offerings with digital services and started to foster digital innovation, identify opportunities, and white spaces to offer new digital services. An M&A strategy is defined by identifying interesting merger or acquisition opportunities and running the process to possible agreements. As the company CEO publicly expressed in the news media about the most recent acquisition:

“Our service selections complement each other perfectly. Now, we will be able to cover the needs of our customers even better.” (CEO of Huld)

The company successfully delivers digital solutions and can say it is a key player in this digital services community. As it more and more aligns on strategic goals across the digital ecosystems, the customer value proposition is refined. Not all its customers are targeted yet, so the company pushes for broader adoption and promote and communicate own vision to customers.

3.2.6 Digital Talent

The organization has team leaders appointed and incentivized to make quick decisions, take risks, and experiment. The mindset of the organization has started adapting towards digital, e.g. developing the required skills across the organization, building new capabilities, hiring digital talents and retaining the specialists.

The case company has a dedicated people strategy to attract and onboard digital talent, based on a good executive guidance. Besides, the company is still struggling to retain specialists. As one of the C-level interviewees recognized:

“It is kind of big challenge how to keep specialists in our company. People are changing workplaces much more. There are a lot of turbulences, and one challenge is how to give motivation during such time. No matter how much salary budget or sauna evening we have or interesting projects, people still leave.” (COO, June 2022)

It also runs programs to upskill and train the employees. Most employees already have the digital skills required by customers. As one employee pointed out:

“We at Huld believe that it is important to develop your skills. Education and learning are a natural part of work and life. That is why we want to encourage Huldians to learn new things.”

Digital talents are recruited in a dedicated COE, successfully delivering digital projects with focus on value generation. But the company does not have a strategic workforce plan. Most of the employees already have the digital skills they need today. Regarding the upcoming in demand technology skills, Figure 7 shows the most expertise the case company will need in the next 2-3 years. The results from the second survey, Appendix 3 taken by BUs and Appendix 4 taken by competence leads reveal that the AI (Machine Learning, Deep Learning), Big Data/ Analytics, Cybersecurity, Cloud programming, Wireless Technologies (5G, LiFi, etc) will be the most in demand skills in the nearest future.

In addition to the proposed future skills shown in Figure 7, “Agile methods to innovate and conceptualize the entities of smart devices and digital services” is suggested by the respondents to the survey provided in Appendix 3. Moreover, the respondents suggest that the technology skills for the future work depend on the company's strategy.

The goal of this second survey (Appendix 3 and 4) was to hear directly from competence leads and customer's main business contacts about the digital skills needs, the impact of COVID-19 pandemic on the workplace and ideas for training and upskilling.

Figure 7 shows a strongest growth of the AI, Big Data analytics and Wireless technology demand in the next 2-3 years compared to today's digital skills.



Figure 7 The digital skills for today and tomorrow (Results from Digital Transformation Acceleration Questionnaire, Appendix 3 and 4)

Through these survey results, the case company better understands the specific digital skills that are needed and provide recommendations on the tools and training that can help its businesses better prepare for the future. Thus, the company needs to base its actions on a clear digital strategy or long-term workforce plan in terms of attracting, recruiting, and especially retaining digital talent.

3.2.7 Dynamic Platform Organization

The company has a central or hybrid organization with Centers of Excellence in BUs and functions in place sharing cross departmental topics. Digital is fostered by central governance, and the company also has KPIs in place to measure progress in digital. However, currently there is no Chief Digital Officer (CDO) assigned, neither centrally nor in the BUs/ functions.

The organization has a few teams that experimented the agile ways of working, but there is no agile culture rolling out across the organization. As one of the C-level interviewees expressed:

“Work is changing in many aspects, to adapt to change we need to be agile. What we have done well in the latest 10 years, might not work the same in the future.” (COO, June 2022)

An agile organization should be able to adapt and react quickly to changing the organizational culture, mindset of employees. It also empowers the cross functional teams to tackle the digital initiatives. Figure 8 below indicates the cross-functional collaboration across the organization.

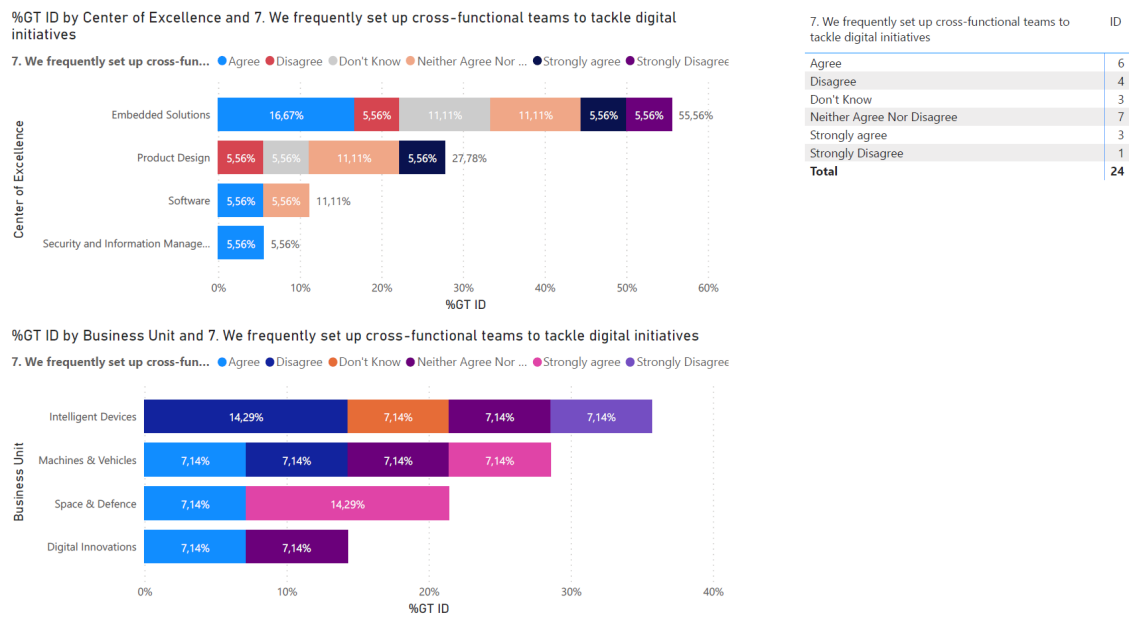


Figure 8 Cross functional teams to tackle digital initiatives (Results from Digital Transformation Acceleration Questionnaire, Appendix 3 and 4)

The survey’s results shown in Figure 8 indicate that the respondents from COEs have more insights into the organization culture, therefore 38,91% of them agree with the statement that the case company has setup cross functional team, while only 28,57% of the respondents from BUs have the same level of agreement. The 28,56 % “neither agree nor disagree” responses from BU’s respondents indicates that they do not have a strong opinion about whether the company develops new ways of working together to achieve common goals.

The results from the Digital Acceleration Index survey (Appendix 2) show that some digital initiatives are managed across the BUs but the company does not have a digital roadmap developed to reach its digital ambition and strongly engage all stakeholders

from BUs and COEs. The average of the Digital Acceleration Index from all 9 respondents was 34, i.e. 16 points below benchmark. This means the company succeeded fairly well in defining the company ambitions and strategy content, but when analysing the survey's results and interviews, the biggest issue is that the digital initiatives are executed in functional silos, blocking the transformation and slow digital acceleration in three primary areas: optimized operations, agile culture and new way of working and digital talents to create digital experiences at scale.

For most of digital services companies, the COVID-19 crisis has had an “all-or-nothing effect” on their digital strategy agenda. A Deloitte survey (Kane et al. 2020) found out that 77% of CEOs reported that the pandemic had sped up their company's digital transformation plans or even their company has experienced years of digital transformation in the span of a few months. The company case is situated through those companies for that the crisis has accelerated the digitization in terms of way of working and do business. As one of the C-level interviewees responded to the question if the COVID-19 pandemic has any impact on speeding up case company's digital transformation:

“Absolutely! It happened to Huld as well. The COVID-19 pandemic forced us to move to remote work in a couple of weeks. You cannot do changes due to technical reasons, but it is a cultural factor.” (COO, June 2022)

This interview results show that digitization is changing the company cultural experience, not only in terms of new technology, but also in terms of way of working shaping the way of interaction and foster a work relationship that motivates employees to try and learn new things.

Summing up, one of the basic challenges revealed in the digital strategy practices relates to developing a digital culture for the organization and digital vision for the business and especially for the future operating model. The top management works intensively with setting up and ensuring a dynamic strategy but concentrating on silo working way and focusing less on the customer journey and on delivering new, innovative digital capabilities that will have greater value for both the business and customer. These silos block the transformation and slow digital acceleration.

These findings are based on the BCG's survey called Digital Acceleration Index (DAI) study, a global survey of about 2 300 companies across the same industry that assesses the company's digital needs to accelerate its transformation to comprehensive digital operations.

3.3 Analysis and Findings of the Current Digital Transformation Maturity Analysis

The analysis below was done based on the assessed BCG's Digital Acceleration Index (DAI). The *Digital Acceleration Index* is a key predictor of success for an organization launching a digital transformation and it helps the organization measure its ability to create value through digital.

Furthermore, the BCG tool determines the digital maturity level of the organization to help building a roadmap for the future.

The BCG *Digital Acceleration Index* was used for the current state analysis of the case company's digital maturity. As seen from the above surveys results, the current state of digital transformation within the case company is steady but not accelerating.

The assessment of the Digital Acceleration Index was done following the logic shown earlier in Table 2 (in Section 3.1), and the results are summarized in Table 3.

As seen in Table 3 below, the final digital acceleration index shows the maturity of the case company across 7 dimensions: (1) the business strategy driven by digital, (2) data and technology, (3) operations, (4) customer experience, (5) new digital services and business models, (6) digital talent, and (7) dynamic platform organization.

The results of assessing the digital acceleration index for the case company are summarized in Table 3 below.

Table 3. Digital Transformation Acceleration Index (BCG's DAI survey results)

	Dimension	Score	Digital Transformation Maturity stage
1	Business Strategy Driven by Digital	50	Literate
2	Leveraging the Power of Data and Technology:		Literate
	Data & AI	20	
	Modular Technology	44	
3	Operations	27	Literate
4	Personalized Customer Experience	29	Literate
5	New Digital Services and Business Models	33	Literate
6	Digital Talent	50	Literate
7	Dynamic Platform Organization	33	Literate

The results of assessing the digital acceleration index for the case company, as seen in Table 3, point to the digital transformation maturity stage to be at *Stage 2, Digital literate*.

More specifically, the organization is a digital “literate” that has some digital solutions in place with the current strategic planning. Some processes have been digitized and BUs have already launched digital initiatives, but in functional silos at the case company, and it fits with the logic identified by BCG (2020) and shown in Figure 2.

3.3.1 Strategy

When assessing the current *Strategy* according to BCG (2020), the following results were gained. The organization explores the vision, ambition and priorities topics ranked as most important and considers them key factors to achieve its digital maturity goals. Its digital strategy scored at 50, i.e. 7 points below the benchmark services industry. The scores are shown in Figure 9 below.

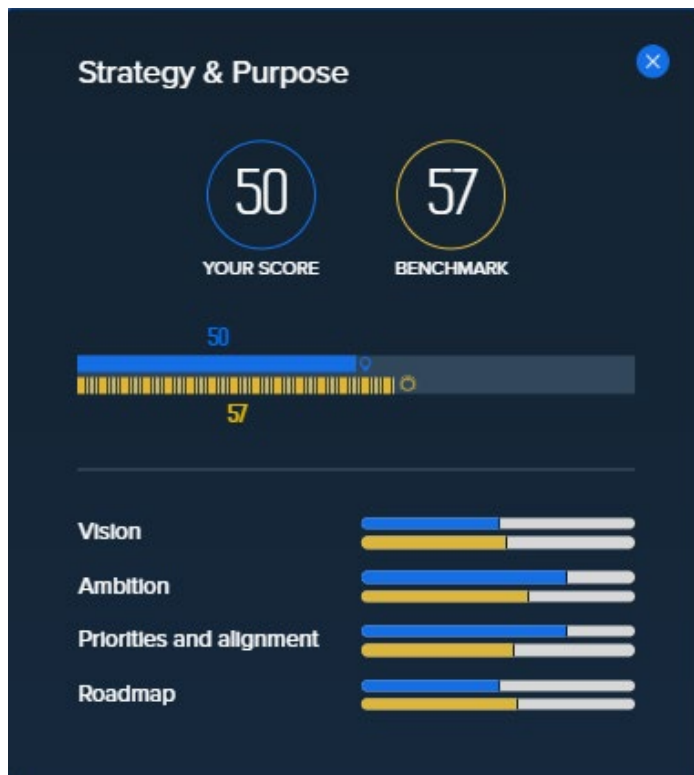


Figure 9 Digital Strategy Maturity (according to the assessment done based on: BCG, 2020).

At the same time, a recognized drawback is that the case company has not yet developed a digital transformation roadmap, but the results indicate the right course the company place the digital transformation at the core of its strategy. The trends and impact of digital were analysed, but the vision is not articulating a digital strategy across operations. As the key stakeholder expressed it:

“We do not have a digital vision on how the company’s future looks in 2-3 years. But I can say for sure, work is changing, new generation of workers are coming to work. We should be more agile.” (COO, June 2022)

Developing a digital aspiration for the business and especially for the future operating model would allow the company to form new work relationship and increase the speed of decision-making across the organization.

3.3.2 Technology

When assessing the current *Technology* according to BCG (2020), the next generation technology including DevOps and IoT scores 44, i.e. 7 points below benchmark. While

Data & AI scores only 20, i.e. 32 below the benchmark services industry. The scores are shown in Figure 10 below.

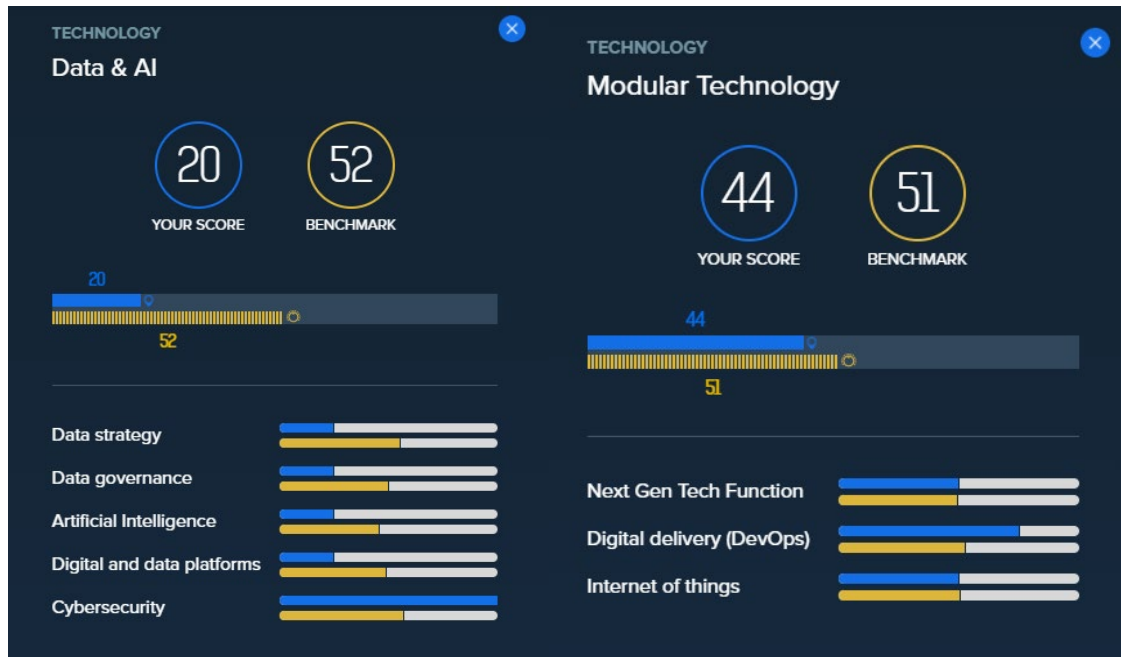


Figure 10 Technology Maturity (according to the assessment done based on: BCG, 2020).

Thus, the organization has started experimenting with proof of concepts (POCs), but a data strategy is not part of the top-management agenda. DevOps and continuous-development principles for IT development and operations. Projects teams are using code repositories, and processes are similar for all stages of the software development life cycle except for deployment. With a strong DevOps culture, the company uses the new technology in conjunction with the processes and people to change business performance.

3.3.3 Operations

The organization operations including relevant processes (service operations, corporate center, shared services and centers of excellence) score 27, i.e. 14 points below benchmark. (Figure 11)

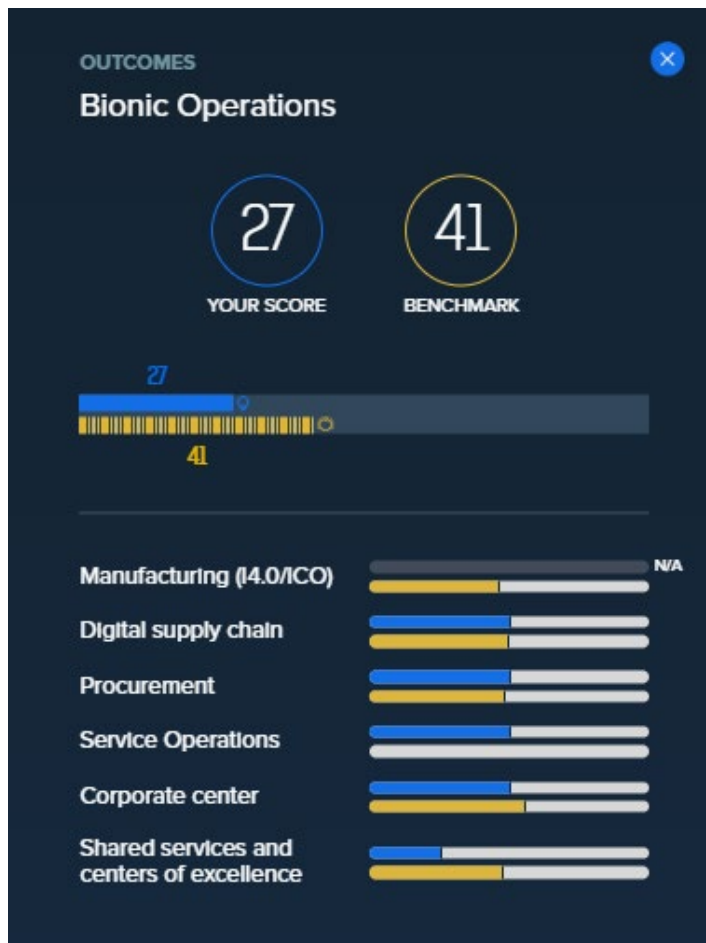


Figure 11 Operations Maturity (according to the assessment done based on: BCG, 2020).

The organization has many manual activities in most of the processes, e.g. production scheduling, forecasting and data is likewise fragmented and often missing or not valid. Furthermore, the processes including administrative tasks are not fully automated. Only CRM tool and business analytics are used with limited capabilities. This customer experience is not leveraged as input for feedback loop into processes.

3.3.4 New Growth

The opportunities for new businesses scores 33, i.e. with 18 points below the benchmark. (Figure 12)

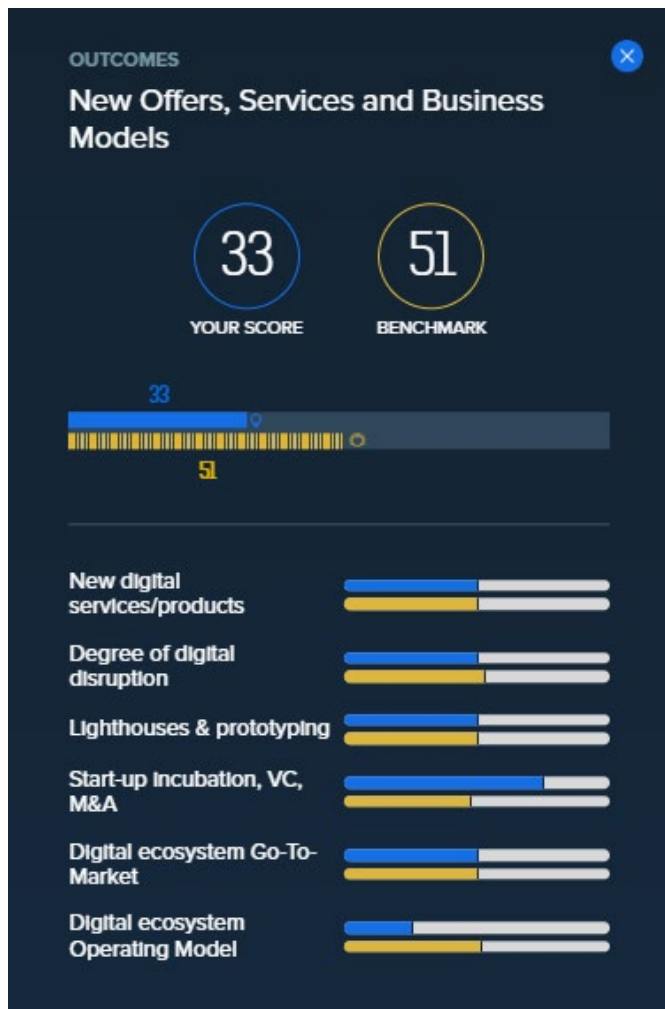


Figure 12 New Businesses Maturity (according to the assessment done based on: BCG, 2020).

The case company has started to complement its core offering with digital services and to experiment with customer-led innovation identifying not really structured but ad-hoc new value pools. Less than half of the respondents recognized that the company started to define a value proposition and which customers to target via a digital ecosystem. Moreover, the company formed partnerships but not yet a digital ecosystem community and aligned sporadically its own strategic goals with some partners. As for the value captured and the business coming from disruptive digital organizations, the respondents are split into two different opinions: (1) the company is benchmarking its competitors but has no relationships and not investing yet in any disruptive organizations and (2) the company has successfully launched disruptive businesses and joint ventures. However, the case company an M&A strategy defined. It plans to continuously grow and launch such strategy and to scale up.

3.3.5 Customer Experience

The personalized customer experience scores 29, with 22 points below the benchmark. (Figure 13)

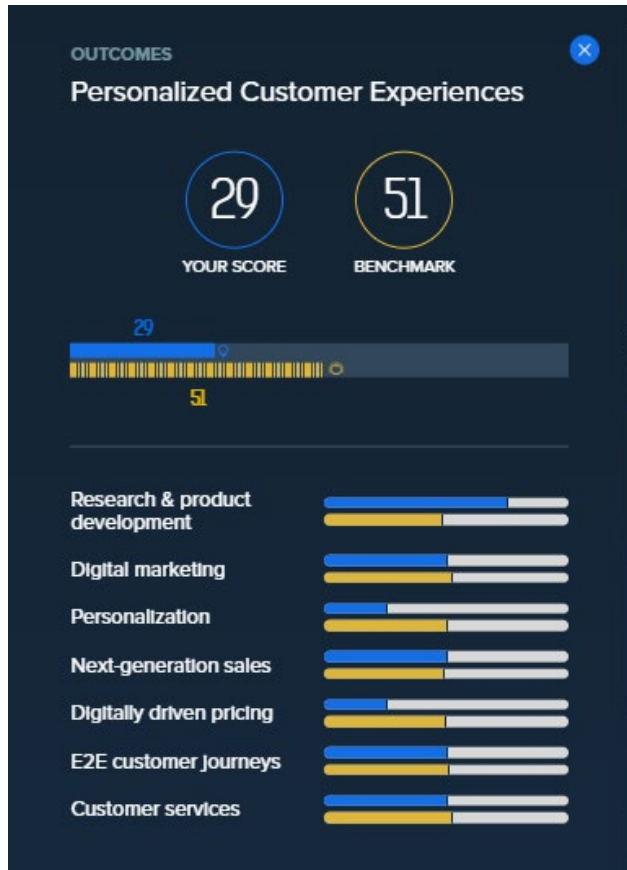


Figure 13. Customer Experience Maturity (according to the assessment done based on: BCG, 2020).

The company keeps engaged with the customer through its Business Units, swiping changes in customer expectations regarding the products and services.

The top management were unanimous in their responses when answering to the question how they run a digital marketing operating model and target the customers via digital channels. Their response was that the company has focused on the touchpoints that matter along the customer decision journey, but they do not feel it is able to effectively track and optimize its execution and ROI. Moreover, the company has digital marketing experts locally but siloed next to “traditional” marketers and has started experimenting with data-driven customer personalization.

Currently the company is evaluating scenarios on how to improve the customer experience. It did not start yet to develop measures along the customer journey to track satisfaction.

3.3.6 Digital Talent

The digital talent, including leadership and culture as well as people's skills, scores 50, i.e. with 2 points below the benchmark. (Figure 14)

When asking top management if a digital is institutionalized through leaders and cascaded throughout the whole organization to foster a cultural change, the responses are also split into two different opinions: (1) there are no dedicated leaders to manage or drive digital initiatives and (2) the organization onboards digital talents into new roles and has started to adapt towards digital working collaboratively under a good executive guidance.

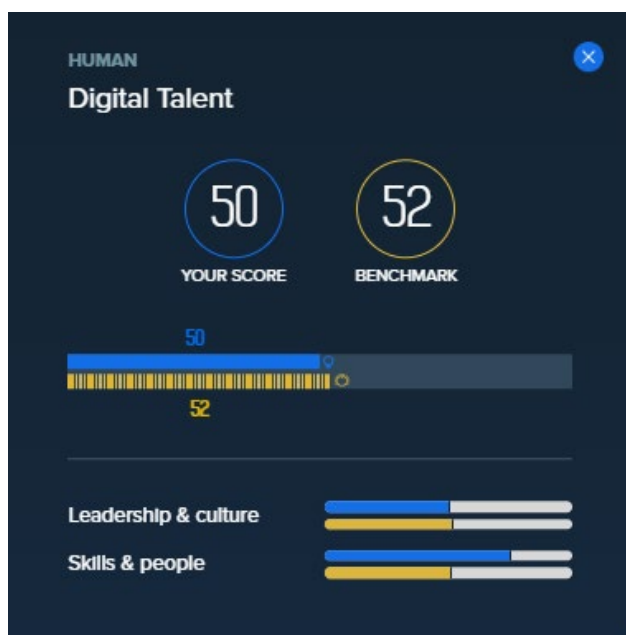


Figure 14. Digital Talent Maturity (according to the assessment done based on: BCG, 2020).

Therefore, a redefining of organization leadership mindset, talent and capabilities for the new digital world is always needed to achieve long-term digital transformation for various industries.

3.3.7 Dynamic Platform Organization

The dynamic platform organization, including organizational governance, agile at scale and digital transformation accelerator, scores 33, i.e. with 17 points below the benchmark. (Figure 15).

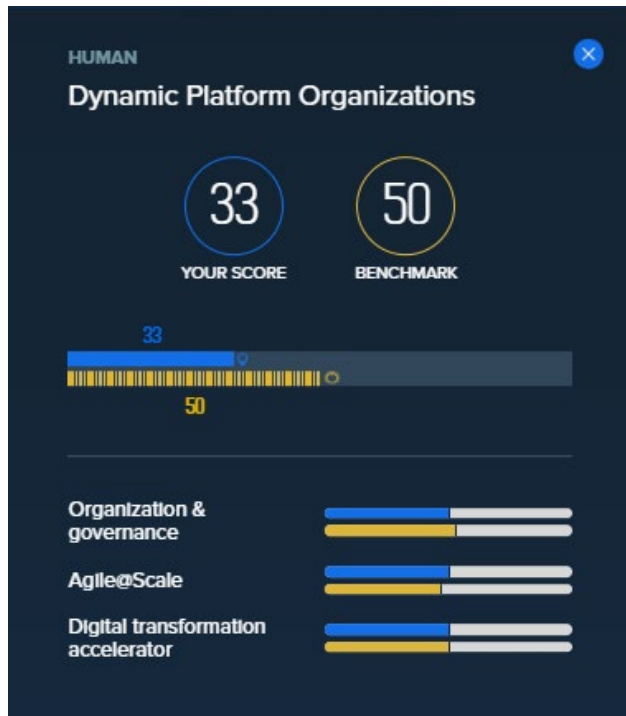


Figure 15. Dynamic Platform Organization Maturity (according to the assessment done based on: BCG, 2020).

According to the digital acceleration index survey, respondents said digital is still executed decentralized and there is no decision to push digital across BUs and functions. Furthermore, the company experiments with agile ways of working but there is no agile culture rolled out across businesses and IT to deliver measurable business value and the organizational, governance and technology agility enablers are not addressed.

According to a senior lead, an agile management of working can implant the values of knowledge sharing among the employees, in which knowledge about tools, culture, libraries, development environment settings or best practices can be shared. As the senior lead pointed out:

“I had to setup a test environment for one project and spend some time on that. But similar configuration or libraries might be already done in other project in the company. Having the ready-made solution with the existing libraries, methods from other colleagues would help saving the hours spent for developing the solution from scratch.”

Therefore, the employees and company can benefit of knowledge sharing because it helps the employees and organization’s business to be more agile and adaptable to the changes.

Next sub-section provides an overview of the main strengths and weaknesses identified in the current state analysis.

3.4 Summary of the Current State Analysis Results

This section summarizes the results of the current state analysis pointing to the main strengths and weaknesses identified in the evaluation process of the company’s digital maturity across the major 7 dimensions and discussions with the key stakeholders.

Figure 16 summarizes the results from the questionnaire conducted with the stakeholders based on Digital Acceleration Index (DAI) tool (BCG, 2020).

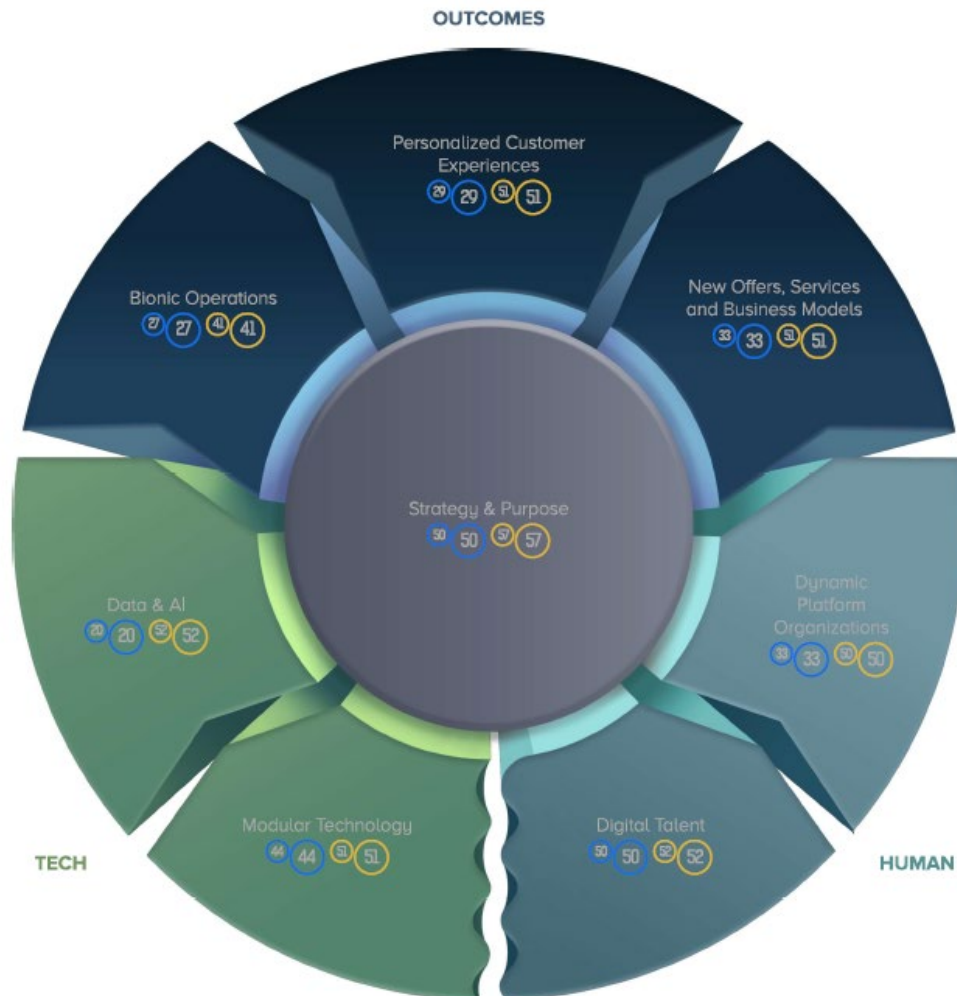


Figure 16. Digital Maturity and Benchmark Report for the Case Company (according to the assessment done based on: BCG, 2020).

The DAI scores by dimension, as seen in Figure 16, reflect major differences in the assessment of digital maturity among all 7 dimensions. Standing above the rest, the *Strategy Driven by Digital* dimension scored 50 points, the highest average score. This score suggests that a significant number of top managers acknowledge the importance of digital transformation and need of a detailed plan to achieve it successfully. Moreover, the *Strategy Driven by Digital* was only 7 points below the benchmark, but still far below its own target of 92 points.

The *Operations*, *Personalized customer experiences* and the *New offers, services and business models* drive to *Outcomes*. The *Outcomes* DAI assessed the marketing and customer offers, operations, support functions, new digital growth, people and digital ecosystem. The case company has *Operations* DAI score of 27 points, that reveals a low degree of digitization in front and back-office processes. Thus, in terms of systematic

operating model the case company is below the benchmarking with 14 points that reflects compared to other companies in the same industry the operating model is not enough agile or adapted to the new capabilities. The top management participants to DAI survey considers the company is focusing on the touchpoints along customer decision journey but do not feel that it is able to effectively track and optimize its execution and ROI. Missing direct personalized relationships with the significant customers positions the case company with 37 points far below the benchmark as seen in Figure 16. Pursuing new digital growth, the case company scored 29 points, i.e. with 22 points below benchmark, with the expectation that its digitization efforts will bring greater growth and enable it to launch new services.

The DAI research on the *Human* investment divided into *Dynamic Platform Organization* and *Digital talent*, shows that the case company understands that introducing new ways of working is critical. This is evidenced by a DAI score of 33 points in the *Dynamic Platform Organization assessment*, i.e. with 17 points below the benchmark and 50 points in the Digital talent assessment, i.e. only 2 points below the benchmark (Figure 16). This benchmarking reflects that majority of the companies in the same digital services industry plan to upskill more in the coming years.

In digital transformation, the *Technology* is essential to unleashing human creativity and exploiting opportunities. Thus, the case company has started experimenting with use cases and proof of concepts, but without implemented a structured plan to realize this value. The DAI survey results show that the next generation technology including DevOps and IoT scores 44, i.e. 7 points below benchmark, while Data & AI scores only 20, i.e. 32 below the benchmark services industry. (Figure 16). The Data & AI benchmark result shows that the other companies in the same industry are well advanced in terms of digital maturity. The COVID-19 pandemic has definitely increased the need for use of the digital services as well improving their efficiency significantly from 2019 through 2021.

Overall, the case company is still behind the benchmark in terms of digital maturity. The benchmarking is comparing companies from 27 countries from Europe, Asia and the US, ranking each company's digital transformation acceleration on a scale from 0 to 100 as described in Figure 2, the 4 stages of digital maturity defined by the BCG's Digital Acceleration Index (DAI). Companies with a DAI score from 76 to 100 qualify as a *digital leader* that has a well-defined digital strategy and roadmap to execute the digital vision.

Those with a score from 51 to 75 are *digital performers* building digital proficiency and coordinate the capabilities successfully through Centers of Excellence. Then those with a score of 50 or less are *digital literates* that are aware about digital systems as an opportunity to speed up and optimize the operations as well as changing the way of working through an agile digital culture. And those with a score of 25 and less are digital starters that experiments some rudimentary and ad-hoc digital transformation plans.

Next sub-sections cover the strengths and weaknesses found out during the analysis of Data 1 collection and chosen key areas to focus the Centers of Excellence can focus on and find improvements to accelerate the digital transformation of the case company.

3.4.1 Strengths and Weaknesses

Based on the above key findings, the strengths and weaknesses identified during the analysis of Data collection¹ can be formulated for the company's digital transformation journey as follows.

First, the organization has highly skilled and innovative *digital talents*.

Second, the company is continuously identifying new opportunities to *reinvent customer journey*.

Third, the company has a dedicated *people strategy* to attract and onboard digital talents based on a good executive guidance.

Fourth, the COEs are *successfully delivering digital projects* with focus on value generation.

In addition to the identified strengths, the weaknesses also gave clear understanding of the roadblocks that are impeding the acceleration of digital transformation in the case company. The following weaknesses were also identified in the current state analysis based on the results from the surveys and discussions with the key stakeholders.

First, as for the digital technologies deployed across the organization, there is a low degree of digitization for strategic processes, such as decision-making and there is no advanced digital analytics approach for a more systematic decision support.

Second, in terms of digital talent, the company does not have a holistic resourcing plan in terms of attracting, recruiting, onboarding and especially retaining digital talent and it has not yet developed a *roadmap to reach the digital ambition and customer future expectations* on the future digital skills.

Third, in terms dynamic organization, the company does not have an agile culture rolled out across BUs and Centers of Excellence to drive digital transformation and to deliver measurable business value.

Table 4 below summarizes the strengths and weaknesses for the company's existing digital transformation stage.

Table 4. Strengths and weaknesses for the case company during the analysis of Data collection 1.

STRENGTHS	WEAKNESSES
The organization has highly skilled talents	Operations: Low degree of digitization for decision-making process.
The company is continuously identifying new opportunities to reinvent services provided to customers.	Digital talent: The company does not have a holistic resourcing plan and a roadmap in place to rapidly changing customer expectations.
The company has dedicated people strategy to attract and onboard digital talent, based on a good executive guidance.	Dynamic platform organization: The company does not have an agile culture rolled out to drive digital transformation.

Next sub-section provides the selected focus areas identified in the current state analysis.

3.4.2 Selected Focus Areas

The key findings point to, first, the strengths and the weaknesses of the current digital transformation journey in the case company and, second, to the most relevant domain impacting the case company digital journey.

The analysis of the digital maturity of the case company revealed (1) the operations optimization key factor as a systematic digital approach in decision making to improve the quality of work and ensure customer satisfaction, (2) the key digital talent factor that enhances the changes to digital transformation to succeed points to building capabilities for the workforce of the future and (3) the key to creating a dynamic organization lies in creating an agile culture and new ways of working.

The same areas were pointed out by the key stakeholders as necessary building block for *the roadmap to reach the digital ambition holistically across the Centers of Excellence* and summarized in Table 5 below.

Table 5. Selected focus areas for accelerating the digital transformation via building a roadmap for the case company.

DIMENSION	
1	Operations Optimization (Implementing a systematic digital approach in decision making)
2	Digital Talent (Building capabilities for the workforce of the future)
2	Dynamic Organization (Creating an agile culture & way of working)

These selected areas for accelerating the digital transformation will be dealt with in the following sections in order to build a functional roadmap for the case company. In the following Section 4, available literature and best practice for creating a roadmap to digital transformation is explored to identify relevant guidance for building such a roadmap later in Section 5.

4 Existing Knowledge and Best Practice for Creating a Roadmap to Digital Transformation

This section discusses the best practices from the available business literature, articles and white papers. The previous Section 3 focused on the current state analysis of the case company identifying the main areas to focus on for building the digital transformation roadmap.

In the evaluation of digital business transformation services providers, Fenwick (2020) provides a comparative assessment of top organizations in the market and classifies them as leaders, strong performers, contenders, and challengers, based on a digital transformation scorecard model. Figure 17 below highlights Accenture, Boston Consulting Group (BCG) and McKinsey as leaders in accelerating digital transformation across their organization as well helping clients build new digital business capabilities.

THE FORRESTER WAVE™

Digital Business Transformation Services

Q4 2020

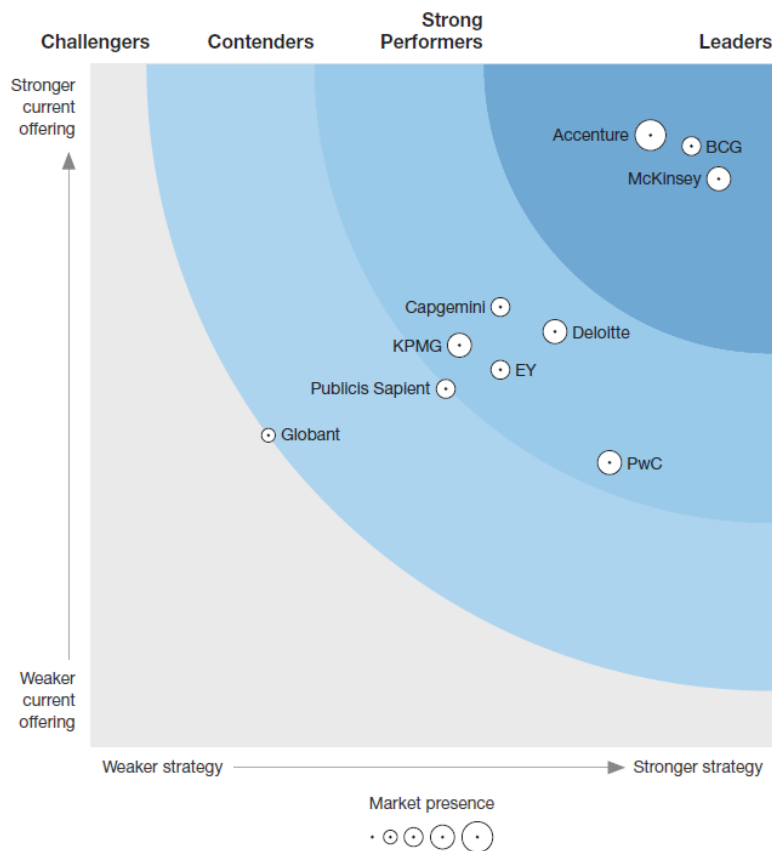


Figure 17. Digital Business Transformation Services Scorecard (Fenwick, 2020).

These organization leaders stand for bringing best practices to the case company in rapidly building strong digital business strategy capabilities, improving the strategic workforce planning to better deliver relevant business outcomes to customers with fast payback and understand how to layer new technology into a dynamic organizational and operational transformation.

The next sub-sections cover the case company's main three challenge areas to deal with as identified in Section 3. These three challenge areas are as follows: 1) Operations Optimization, 2) Digital talent, 3) Dynamic organization.

4.1 Selected Knowledge Areas for this Thesis

In this thesis, the three challenge areas were selected for exploring the available knowledge and best practices, as shown in Figure 18.

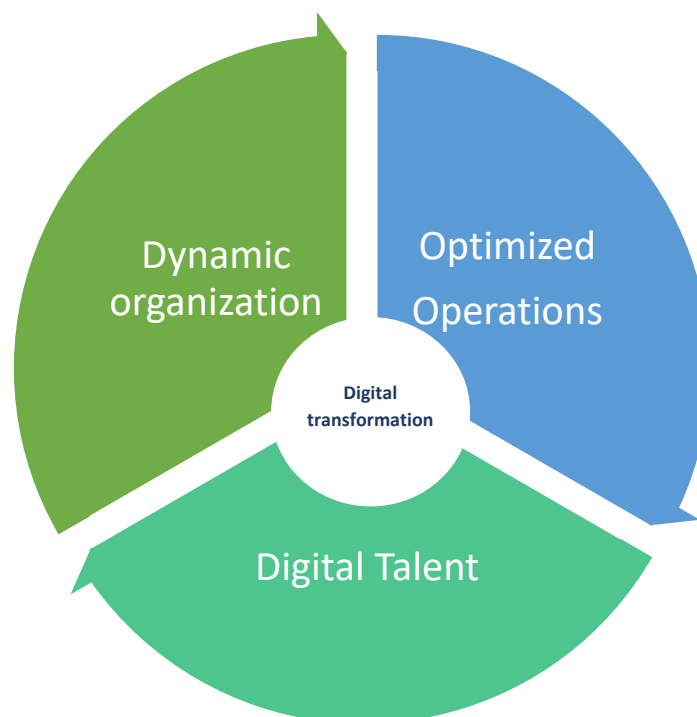


Figure 18. Selected knowledge areas for exploring in this study.

These three knowledge areas (*Operations*, *Digital Talent* and *Dynamic Organization*) were chosen to support the core theme of this thesis, building a roadmap for digital transformation. The First element is *Optimized Operations*, and it enables the

infrastructure modernization for a systematic digital approach through that the digital transformation can improve organizational effectiveness and efficiency. Second element is *Digital Talent*, which enables building a talent strategy for digital transformation focusing on retaining specialists and upskilling. The Third element is *Dynamic organization*. A dynamic organization reflects fundamental changes in culture and leadership style and empowers the way of working, all together driving the digital transformation.

These areas make parts of the Conceptual framework of this study and exploring them will provide relevant tools, methods, concepts and ideas for building the roadmap to digital transformation.

4.2 Element 1: Operations Optimization – Systematic approach in decision making

According to Business Finland and VTT (2018), the growth of business leans on digital operations as tomorrow's smart services are created in a new digital ecosystem. However, understanding what digital transformation means in terms of operations remains a challenge for several companies staying focused on organization's changes modifying its standard operating procedures to include new technologies or use a structured and more systematic operating model. Beyond these aspects, McKinsey (2018) sees an increase in data-based decision making and in the visible use of interactive tools can more than double the success of digital transformation.

4.2.1 Definition of Operations Optimization

Atherton & Associates (2022) defines the *operations optimization* as “the process of ensuring that your operations are performing as efficient and effective as possible.” Furthermore, there are five reasons a company might consider taking a close look in terms of operations optimizations: 1) improving the *quality of work*, 2) ensuring the *efficiency in the long run*, 3) assisting business in *complying with regulations*, 4) tracking the employees' performance, 5) ensuring accurate information.

4.2.2 Operations Optimization Features and Benefits for the Digital Transformation

An important pillar of digital transformation is optimizing the operations, simplifying, and rationalizing existing processes.

According to Atherton & Associates (2022), the *operations optimization* improves the *quality of work* through refining processes that can mitigate costly errors and ensure customers satisfactions. The *efficiency* is a natural outcome of an optimized process, seeing as part of the process to get more productive in the long run and keep track of resources or monitoring ROI (Return of Investment). Since the industry or general data protection regulations are constantly changing, the optimization of processes can assist the business in *complying with regulations*. An automated and optimized process can ensure easiest monitoring and faster for top management to obtain the information. An automated system can drastically reduce the risk from human errors and data loss and improve data monitoring to keep top management informed about *employees' performance* or other changes so they can make decision immediately when it counts. As Atherton & Associates (2022) noted, updated processes lead to updated information. Improving the communication with a clear-cut flow between BUs and COE, results in *accurate information* for employees to perform their jobs well.

Although the beneficial outcomes of implementing optimized operations are widely, McKinsey & Company (2020) highlights three main outcomes as a result of their analyses on 22 organizations in six industry sectors: improved customer satisfaction, employee engagement and operational performance. The achievement of higher level of these three outcomes produces the improvement of financial performance as seen in Figure 19.

The 'agile impact engine' highlights the main outcomes of successful agile transformation.

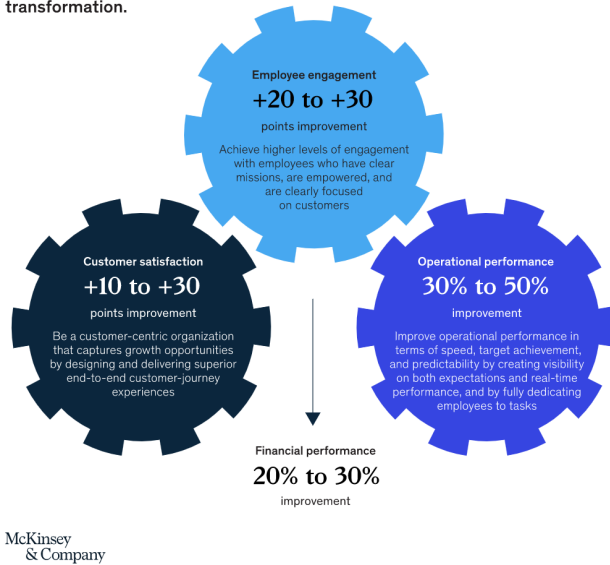


Figure 19. The beneficial outcomes of the organization’s agile transformations (McKinsey & Company, 2020).

According to McKinsey & Company (2020), the extent to which an organization has implemented an agile operating model represents its level of digital transformation maturity. Figure 20 provides a clear path to the implementation of operating model across five dimensions.

To increase the level of enterprise agility, companies face implementation choices across five operating-model dimensions.

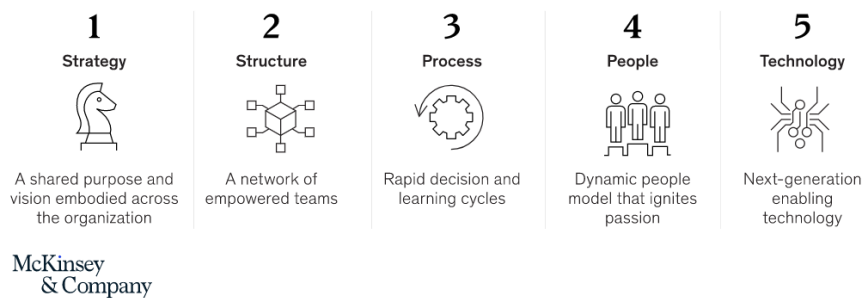


Figure 20. The Five operating-model dimensions (McKinsey & Company, 2020).

Analyzing the set of outcomes metrics during the implementation of optimized operations, McKinsey & Company (2020) synthesizes that organizations use a unique set of metrics depending on their industry sectors, customer type and transformation objectives (Figure 21).

A wide set of outcome metrics were tracked.



McKinsey & Company

Figure 21. The set of outcome metrics by industry (McKinsey & Company, 2020).

However, the organizations that need to attract and recruit new talent focused more on the employee engagement, while those in financial need focused on financial improvement and those struggling competitive pressure concentrated on customer satisfaction.

The optimized operations process is considered by FPT Digital (2022) as a “key factor in the digital transformation of businesses”. Furthermore, it pointed out that the optimized operations bring the following benefits to the company’s businesses: minimizing operational costs, ensuring effective resource allocation, and achieving operational efficiency. The features required by an efficient operation process are depicted in Figure 22.

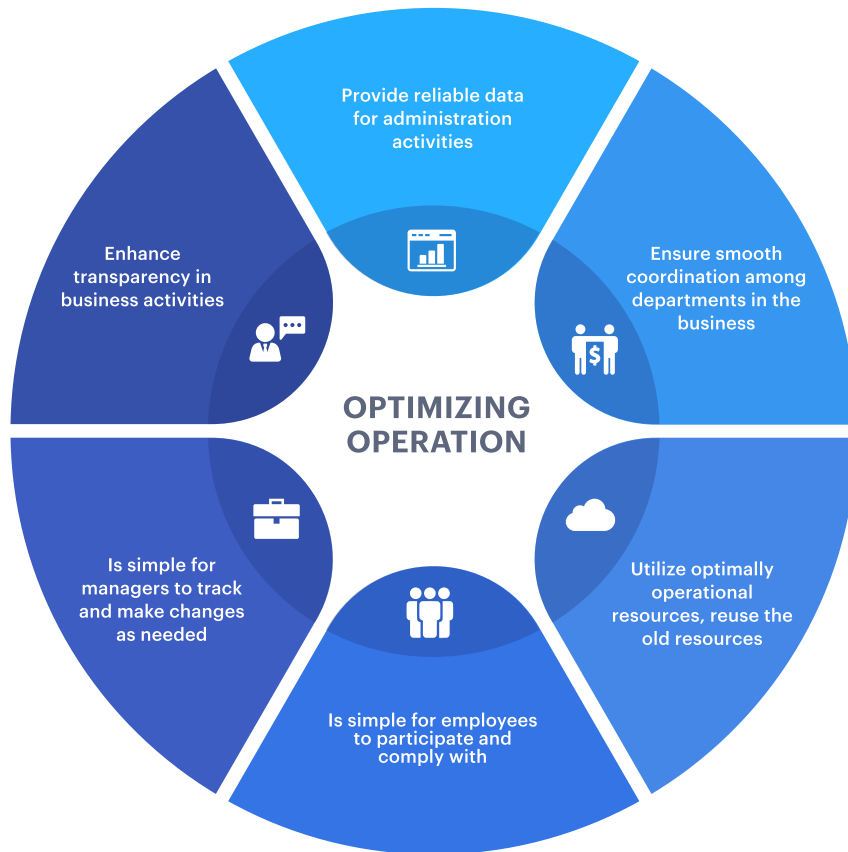


Figure 22. Optimized Operations Process (FPT Digital, 2022).

Thus, starting the optimization of company's operation process, the following stages might be identified: 1) provides real-time reliable data for operating activities, 2) ensure smooth coordination among BUs and COE in the business, 3) utilizes optimally operational resources, 4) facilitates the participation of employees to comply with, 5) facilitates tracking and making changes as needed for top managers, 6) enhances transparency in business activities.

Accenture also recognizes that optimizing operations is critical to organizations. According to Accenture (2020), these operations "must match the organization's customer experience (CX) vision and deliver that experience at the pace customers demand and competitive pressure requires." Moreover, the operations must synchronize with the customer experience vision have and work together towards digital acceleration.

For many organizations, the operational transformation for dynamic execution is challenging, costly and resources demanding. Accenture (2020) identifies three areas as critical to optimizing operations: 1) making real-time decisions to deliver a superior customer experience at the speed of digital, 2) integrating all operational activities into a

centralized system to provide visibility into customer experience objectives, and 3) enabling business relevancy with process automation to effectively compete and remain relevant to customers.

1) The ability to make real-time decisions is essential to delivering a superior customer experience to the speed of digital. Accenture (2020) reveals that 52% of business decision-makers point to horizontal silos between departments as one of the biggest impediments to operational cooperation. The employees might have a real-time view of the desired customer experience. This information empowers organization's people to inform their leaders about every customer touchpoint in order to make the right decisions. Having access to relevant customer insights and current conditions, the operations teams can make real-time changes to drive operational excellence.

2) Integrating all operational activities related to customers into a centralized system is one of the leader's priorities in an organization. According to Accenture (2020), 90% of organizations view the chief marketing officer and executive level managers as the "connective tissue" between different lines of business to drive unparalleled levels of collaboration across the entire organization.

3) Automating the operations processes allows organizations to respond quickly to customer needs. "1/3 of workers globally say a lack of standard processes for workflow gets in the way of getting work done." (Accenture, 2020). There are three main benefits of automating the operations processes: (1) free up resources by removing repetitive, manual cross-department process tasks; (2) shift people's focus to continually improving and innovating; (3) drive the rapid execution of customer experiences ahead of competitors and in-sync with customer expectations.

Overall, the operational transformational journey within the organizations must address the employee's engagement and processes to operationalize the customer experience within an operating model for driving real-time decision making and enhance transparency in business activities.

4.2.3 Operations Optimization Analysis

In the daily operations, the benefits of optimized operations process can be seen in its efficiency in the decision-making process (Accenture, 2020).

First, the optimized operations help to clearly define the nature of decision to make. As soon as the top managers have access to the needed information created and maintained by more advanced technologies, the decision making will be more relevant and consistent.

Second, the optimized operations help gathering relevant information. The top management has to first collect the needed information before making a decision.

Third, identifying the alternatives. Once the information has been collected, a desirable list of alternatives as possible paths of actions are identified.

Fourth, evaluating the alternatives is considered the most challenging part in the decision-making process. Using efficient analysis tools, the top managers would be able to choose those paths of actions that have the higher potential for reaching their goals.

Fifth, taking a positive action by starting to implement the chosen alternative through the help of optimized operation process running on the decision making and analysis tool.

Finally, reviewing the decision and its consequences. If the decision has not met the expected need, the optimized process can allow repeating certain steps of the process to make a new decision. This can be possible by gathering further detailed or different information or explore more optimal alternatives.

If summarized, the following changes would have a significant impact on the organization:

1. Refining the operations process for providing real-time reliable data for operating activities syncing with customer experience vision. (Atherton & Associates, 2022).
2. Implementing a governance operating model to drive quick and right decision making, enhance transparency in business activities and ensure a smooth coordination among BUs and COE in the business. (Accenture, 2020).
3. Utilizing optimally operational resources. (FPT Digital, 2022)

Summing up, typical benefits from the best practices for creating digital optimized operations can be pulled together to implement a governance model to optimize, simplify, and rationalize the existing decision-making process.

Next sub-section provides the existing knowledge and best practices for the second selected focus areas identified in the current state analysis, digital talent.

4.3 Element 2 of the Conceptual Framework – Digital Talent

According to Frankiewicz et al. (2020), contrary to popular belief, the “digital transformation is less about technology, and more about people.” Thus, the company can buy any technology, but its ability to adapt to digital future depends on the next generation of skills, closing the gap between talent resources and customer demand and proving the digital talent potential.

The awareness of digital talent gap and need for investing in the people who can make the acquired technology useful, it is the main implication of company’s leaders.

In Buvat et al. (2017), Capgemini Digital Transformation Institute identifies the key trends and changes in the digital talent gap pointing out that over 54% of the organizations agreed that the digital talent gap impedes the acceleration of their digital transformation and that their organization has lost competitive advantage because of a shortage of digital talent. (Figure 23)

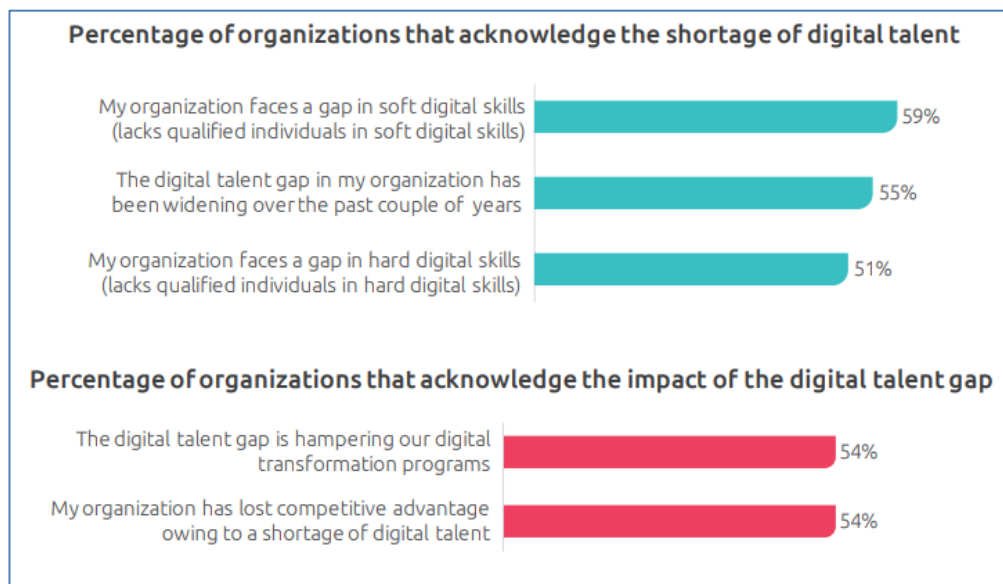


Figure 23. Shortage of digital talent and its impact on competitiveness (Buvat et al., 2017, p. 6).

Besides, as digitalization emerges, it becomes more difficult to find professionals with the right digital skills and many companies end up delegating these responsibilities to junior level employees or even to recent graduates.

4.3.1 Definition of Digital talent

The *digital talent* is defined by Tunc et al. (2020) as the talented employees who are able to adapt and use the existing *digital technologies*. Thus, digital talent is someone who has the needed skills to make things easier. However, the technical skills are not enough. Digital talent needs to have business acumen that means the ability to understand business issues, to own the specific knowledge and make a logical to take decision and gave a positive impact towards achieving the digital vision of the organization.

4.3.2 Description of Digital talent Best practices for a successful Digital Transformation

Capgemini and MIT (2013) research uncovered that 87% of companies feel digital transformation is a competitive opportunity. However, despite the skills shortage, 46% have invested in the development of digital skills.

One of the common challenge most of the organizations have faced is how the technical competence teams and business team speak different languages. The expansion of digital tools and emerged technologies across functions support the business manager to learn sufficient technical skills. At the same time, the technical specialist should be ready to understand the business language in order to be synchronized with their sales, marketing and product counterparts. As highlighted by Capgemini (2013) consulting analysis, in the long-term, the need is for an evolved professional who is equally comfortable with business and technology. (Figure 24)

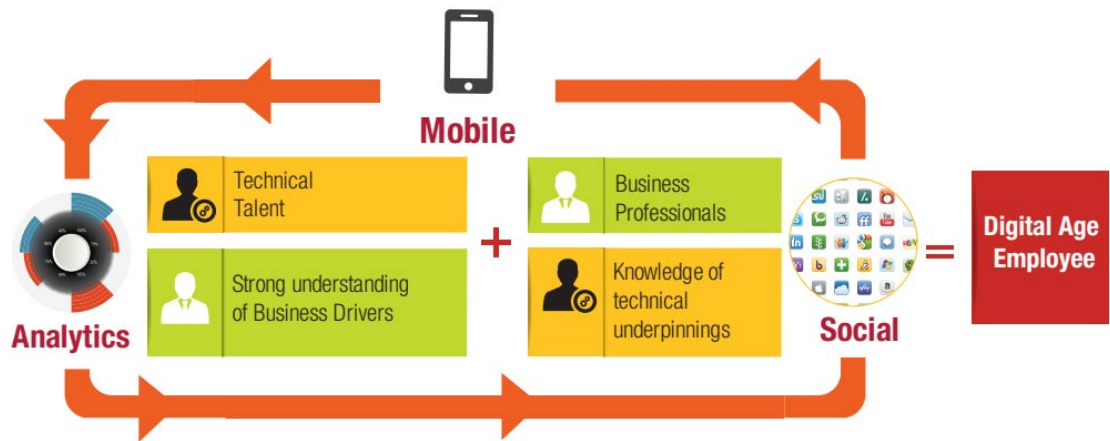
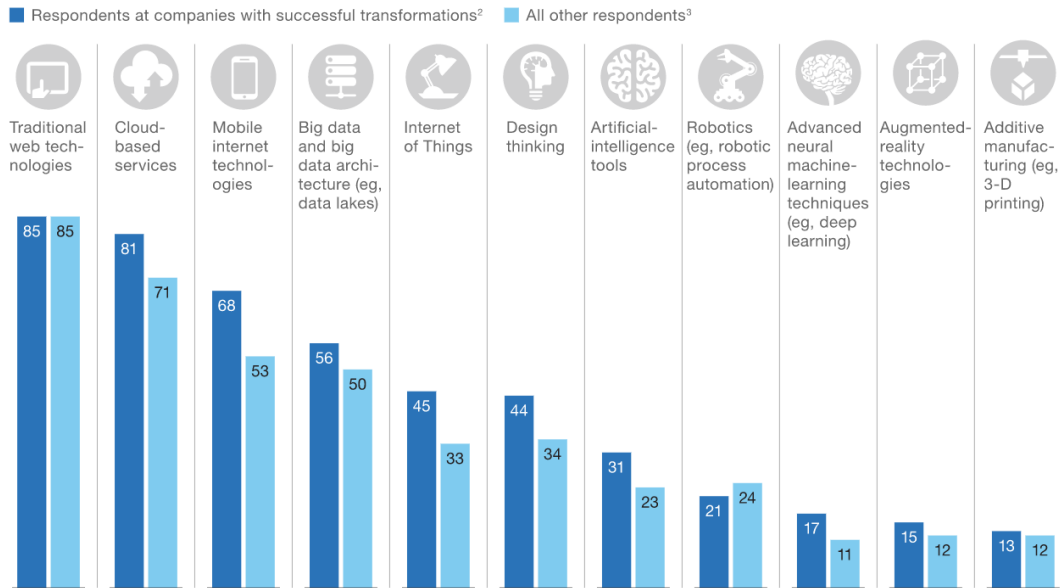


Figure 24. Skill Evolution for the Digital Age (Source: Capgemini Consulting Analysis).

The results from successful transformation as revealed by McKinsey & Company (2018), show that the organizations with accelerated digital transformation are more predisposed than others to use emerged technologies, such as Artificial Intelligence, machine-learning techniques, and the Internet of Things. Thus, organizations with successful transformation use more emerged technologies than others do.

The digital technologies, tools and methods used by organizations with successful transformation is shown in Figure 25, below.

Digital technologies, tools, and methods currently used by organizations, % of respondents¹



¹ Respondents who answered "other" or "don't know" are not shown.

² Respondents who say their organizations' transformations were very or completely successful at both improving performance and equipping the organizations to sustain improvements over time, n = 263.

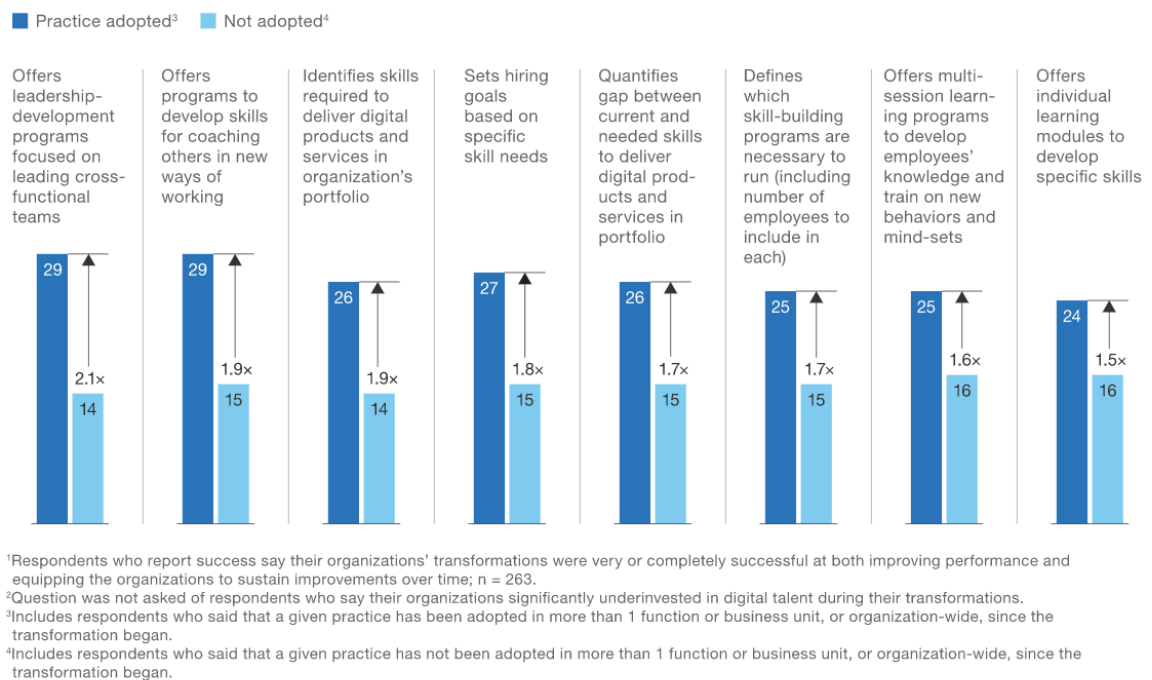
³ n = 1,258.

McKinsey&Company

Figure 25. Digital Technologies, tools and methods currently used by organizations (McKinsey & Company, 2018).

Having these technologies (Figure 25) on hand is just one part of the key factors in place to successful digital transformation. The McKinsey & Company (2018) indicates in Figure 26 the keys to more successful digital transformation.

Success rate of digital transformations,¹ by adoption of organization-wide workforce and talent practices,² % of respondents



McKinsey&Company

Figure 26. Workforce planning and digital talent development best practices (McKinsey & Company, 2018).

McKinsey & Company (2018) research points out five categories of key factors that might enhance the changes of a digital transformation to succeed: 1) having experienced digital leaders, 2) building competences for the “workforce of the future”, 3) adopting new ways of working, 4) upgrading digital tools, 5) mastering digital communication in the workplace.

1) Having leaders familiar with digital technologies is one of the keys to successful transformation. Thus, the transformation's success is more likely through the *leadership commitment* such as the engagement of leaders to focus on transformation initiatives.

2) The McKinsey & Company (2018) research revealed that building the needed competences through the organization is one of the most important factors to successful digital transformation. First, redefining the individual roles and responsibilities to align with the digital vision will help identify the skills needed to be developed by the organization. Second, engaging the specific roles to identify the potential gaps of the digital innovation. Third, possessing specialized digital skills, the technical innovation managers can bring achievements on the company's digital innovations. Furthermore,

the McKinsey & Company (2018) associates the success of an organization with the capacity to scale up its workforce in planning and talent development.

3) Digital transformation requires cultural and behavioural taking risks, increasing collaboration, and customer centricity (McKinsey & Company, 2018). Establishing practices to support new ways of working that promote a positive culture are the key to digital transformation success.

4) Digitizing tools and processes support the acceleration of digital transformation. First, adopting the digital tools that facilitate the access to reliable information across the organization. Second, implementing digital technologies to enhance self-serving for employees and business partners. Third, focusing on technology in optimizing operations, the organization would be able to modify its standard operating procedures to introduce trending technologies.

5) An effective communication is the base of digital transformation. First key to success is communicating a change initiative to employees to understand how it may impact their work and customers, as well as the reason of changing. Second key is team leaders promoting the changes within their team, BUs and COEs.

According to Strack et al. (2017) analysis on “how to gain and develop digital talent and skills”, the biggest challenge is not on perceived and invested technology, but the lack of qualified employees. The study also revealed that the digital talented people are in highly demand so that many companies have to reinvent themselves to attract experts. Strack et al. (2017) highlights that only 25% of the people recruited through the online talent acquisition tools are working today at companies with more than 10 000 employees. The Strack et al. (2017) response to this challenge is that first, the company should build new pools of skilled digital employees by starting to find out who these future employees are, where they can be found and how they can be attracted and retained. Second, the digital talent for specific company roles come not only from recruiting new employees but also from developing the personal digital skills. Lastly, working together in interdisciplinary teams reinforce digital talents to extend the range of their capabilities and create a true digital culture.

Retaining top digital talent is another challenge for organizations. Strack et al. (2014) provides compelling evidence emphasizing the power of appreciation at work to

empower digital talent. Figure 27 shows the ranking factors that contribute to building and retaining the pool of digital talent.



Figure 27. Digital talent ranking retention factors (Strack et al., 2014).

Through the analysis of a large number of recruitment profiles and from several interviews with digital professionals, Strack et al. (2017) has identified six areas where digital talent can have the most impact. As shown in Figure 28, these six areas are digital business models, digital marketing, agile digital development, advanced data analysis, Industry 4.0 operations and established new ways of working. The analysis also identified core skill sets for each profile along with sub-profiles, for instance the “robotics and automation engineer” profile that includes under its umbrella the sub-profiles Test

and automation controls engineer, Automation systems engineer, Robotics software engineer, and Human-robot interaction architect.

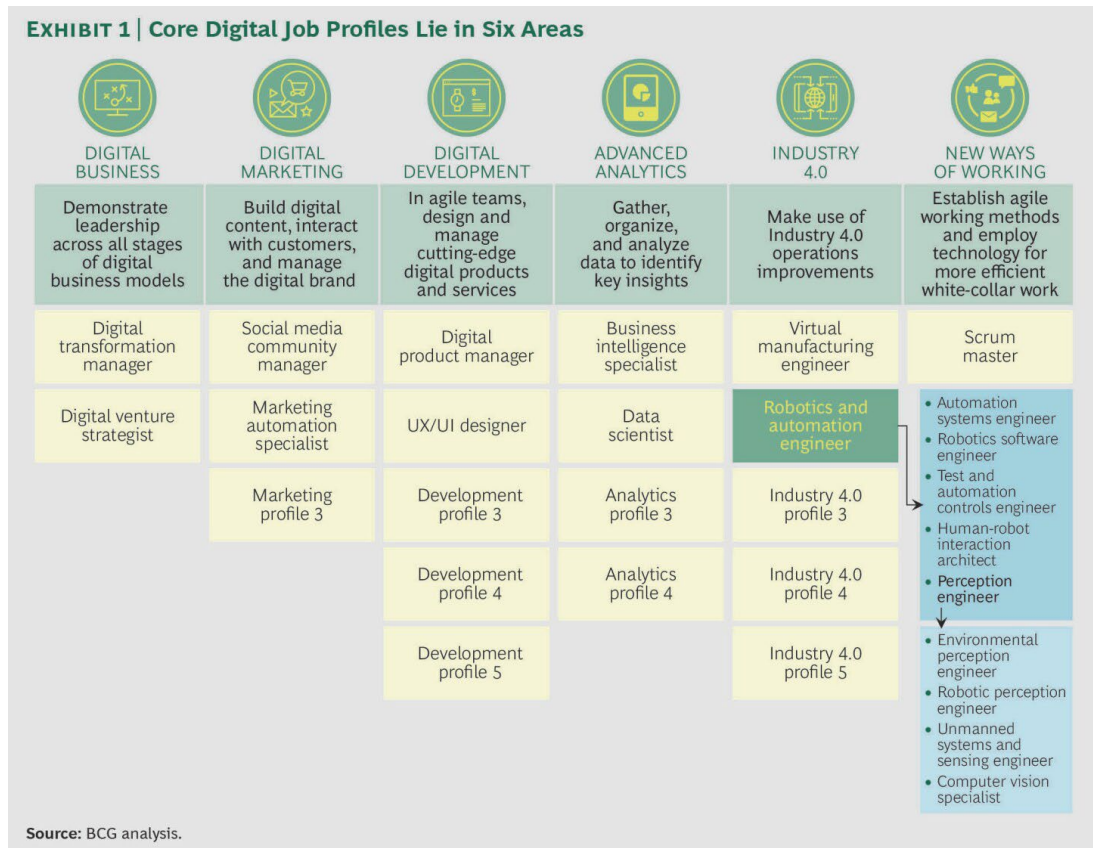


Figure 28. Six Areas of Core Digital talent profiles (Strack et al., 2017).

This analysis helped estimating the required digital talent in terms of the 20 profiles and review the available digital talent in house to create a model that predict the profiles in demand and skills gap.

The strategic workforce planning reveals the future gaps (Figure 29) and that it needs to triple the existing digital talent and train most of the employees in order to achieve its digital agenda and stay competitive. Thus, a strategic workforce planning helped company understand its digital talent needs and provide valuable inputs on the demand for recruitment and development skills to fill the gaps.

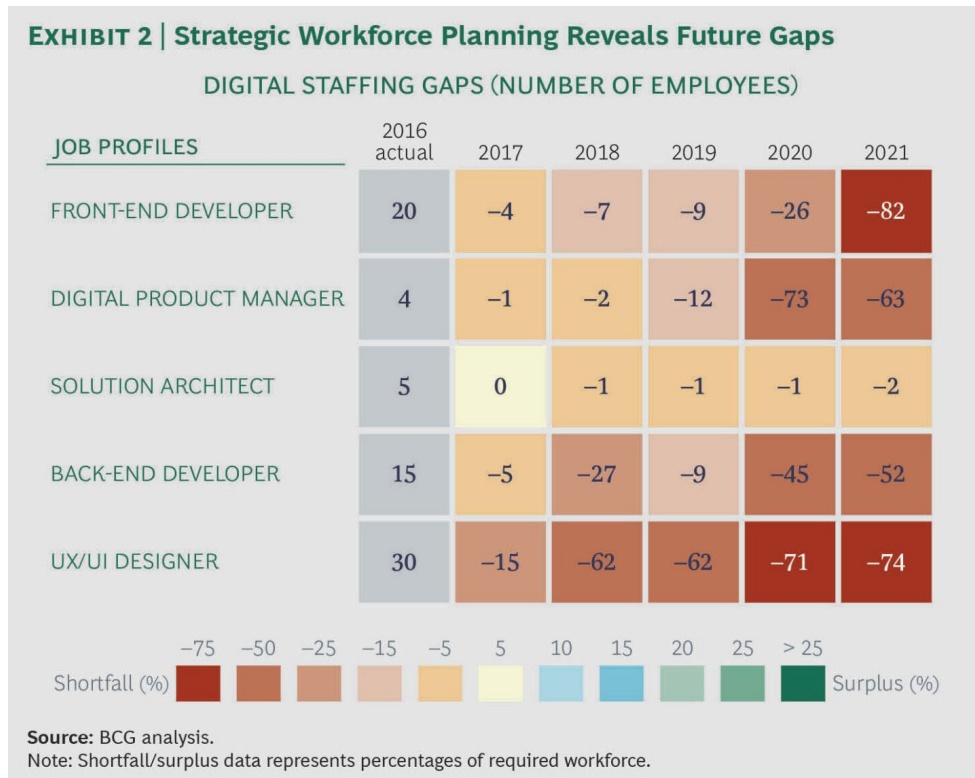


Figure 29. A Strategic Workplace Planning to Reveal the Future Gaps (Strack et al., 2017).

Overall, whether an organization has already started a digital transformation that is adapting to the digital talent mindset, it is important for any company to figure out about the ways in which digitization could impact the business in the near and longer term and take important steps to support the digital talent strategy to enhance its opportunities for a successful transformation.

4.3.3 Digital talent Analysis

An examination of the key factors to digital transformation success, as comprised by digital talent in the best practices and applicable to the case company challenges in providing the needed digital services, revealed significant steps to drive its talent strategy in the digital age.

First, it is vital for companies to have digital geeks leaders to understand the implications of digital to the career paths of digital talents and the way of working across the organization.

Second, the leadership commitment such as the engagement of superior executives and leaders need to be more involved in a digital transformation with active transformation initiatives and dedicated change effort.

Third, redefining employees' roles and responsibilities to align with a digital strategy goal can help identify the capabilities to build the workforce of the future and as demanded by customers.

Fourth, conducting a skills gap analysis and creating a strategic workforce planning could enhance companies understanding on their digital talent needs and provide valuable inputs for recruitment and development skills. McKinsey & Company (2018).

Fifth, focusing on digital talent by investing in their upskilling and reskilling paths to reduce the impact of talent shortages and to keep pace with customer expectations. (Strack et al., 2017).

Lastly, using new ways of attracting, recruiting and retaining digital talent to make sure digital service company recruits for the right set of skills that are in high demand across customer's industries and to digitize the entire employee life cycle, from onboarding to retiring.

To summarize, the following changes would have a significant impact on the organization:

1. Developing employee accelerated career path and ladders within the organization to enhance engagement among the digital talents and leaders in the digital transformation journey with active transformation initiatives and dedicated full time to a change effort. (McKinsey & Company, 2018)
2. Building digital capabilities for the workforce of the future by investing in upskilling and reskilling. (Strack et al., 2017)
3. Developing a strategic workforce plan for succeeding in closing the future skills gap, recruiting, and retaining digital talent. (Strack et al., 2017)

Summing up, all the above measures have a win-win with both digital talent and organization as they are ensuring employee satisfaction and digitalization moving forward the digital transformation.

Next sub-section provides the existing knowledge and best practices for the third selected focus areas identified in the current state analysis, dynamic organization.

4.4 Element 3 of the Conceptual Framework – Dynamic organization

According to Araujo (2014), “the future belongs to the dynamic organization“. The two main factors that will control which companies turn digital to their advantage the identified in the agile at scale across the organization and way of working. Agile at scale means the organization is Agile. Thus, it can develop and deliver measurable business value quickly supported by the technology agility enablers.

The companies might bring the entire organization along the digital journey by creating a real digital culture inspiring their employees a deep understanding of the company’s digital vision.

4.4.1 Definition of Dynamic Organization

A *Dynamic Organization* as defined by Araujo (2014), it is an organization that has the capacity to “uniquely combined specific elements of the four foundational organizational traits to become a responsive, agile and adaptive organization“. Furthermore, the organizational dynamic is defined in the HumanResourcesMBA (2022) as the process of continuously reinforcing resources and enhancing employee performance. Besides, it is also described as the way an organization manages and promotes organizational learning, better business practices and strategic management.

4.4.2 Description of Dynamic organization Features and Best Practices

According to Araujo (2014), each dynamic organization shares three key attributes: 1) fast and reactive, 2) flexible and adaptive, and 3) continuously changing.

First, a dynamic organization is able to quickly respond to customer opportunities and fast innovation of provided services. Second, a dynamic organization is “flexible and adaptive“. As the customers move faster and faster towards digital, they require not only being reactive but that digital service companies offer them the flexibility and adaptability needed to respond rapidly to evolving challenges and opportunities. Third, everything is

changed fast. The organizations have rebranded as the digitization transforms the customer experience, business operations, therefore the digital transformation strategy must be holistic and inclusive of all organization's business segments and functions.

All these factors form together the building capabilities to becoming a dynamic organization, helping the organization improve and get better, helping transform an organization into a dynamic organization.

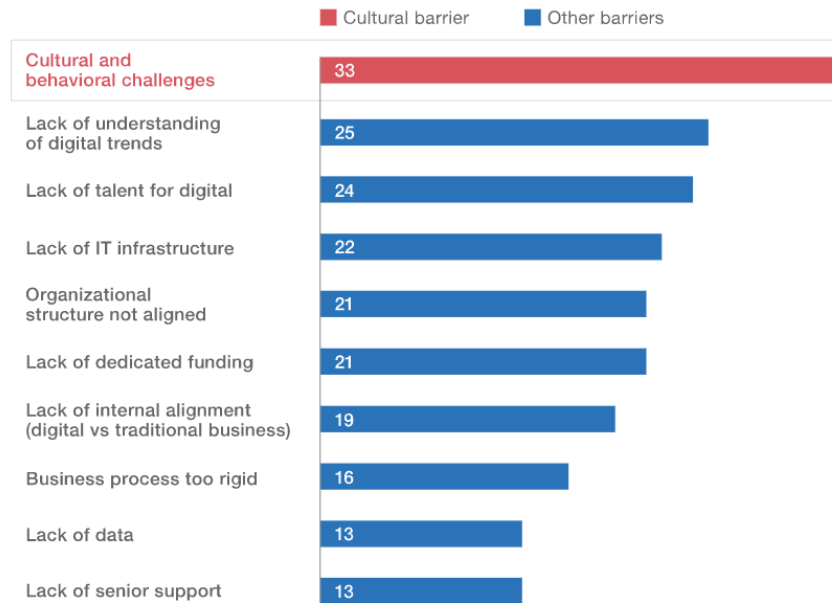
HumanResourcesMBA (2022) revealed that understanding the dynamics of organizational culture is important to all organizations and leaders within all industry sectors. Business, human resources, sales or marketing and finance can benefit from organizational dynamics. Moreover, the development of organizational dynamics places an emphasis on the people-centric approach to create a culture with high performance and long-range employee satisfaction. Implementing the practices of organizational dynamics can resolve conflicts, enhance interpersonal work relationships, implement successful digital strategy, and assess current organization culture needs.

The key to creating a dynamic organization lies in creating an agile culture and new ways of working. First, getting teams together in a strategic way that highlights their strengths would have a positive impact on any business. The work relationship key success and productivity depend on teams build trust, cross functional collaboration, and communication. Second, McKinsey & Company (2018) research results suggest that communicating a change initiative will make employees understand where the organization is headed, why the change is needed, and why is the change important. "At the organizations that followed this practice, a successful transformation is more than three times more likely." (McKinsey & Company, 2018). Third, Goran et al. (2017) reported that key decision makers believe that shortcomings in organizational culture are the most significant barriers to company success in the digital age. Figure 30 below shows the culture as the significant barrier to digital transformation.

Exhibit 1

Culture is the most significant self-reported barrier to digital effectiveness.

Which are the most significant challenges to meeting digital priorities?
% of respondents



McKinsey&Company | Source: 2016 McKinsey Digital survey of 2,135 respondents

Figure 30. Digital culture barriers (Goran et al. 2017).

The Goran et al. (2017) survey of global executives on organizational culture highlights three digital-culture barriers: 1) siloed mind-sets, 2) risk aversion and 3) weak customer focus. Therefore, solving these cultural problems contributes leading the companies through successful digital transformation. First, the organizational silos are often characterized as limited in employees' interactions, acting too slowly because they separate employees and goals from the rest of the organization. Second, a risk aversion holds away the business opportunities and slow down responses to quick-changing customer needs. Third, lacking the understanding of customer vision results in failing to decide where to place the company's outcomes to expand customer choice and take the best actions.

In addition, Booth et al. (2018) found that the organizations can accelerate their digital transformation by focusing on three main areas: 1) adopting digital ways of working, 2) attracting and retaining digital talent and 3) modernizing the IT architecture and environment, as illustrated in Figure 31 below.

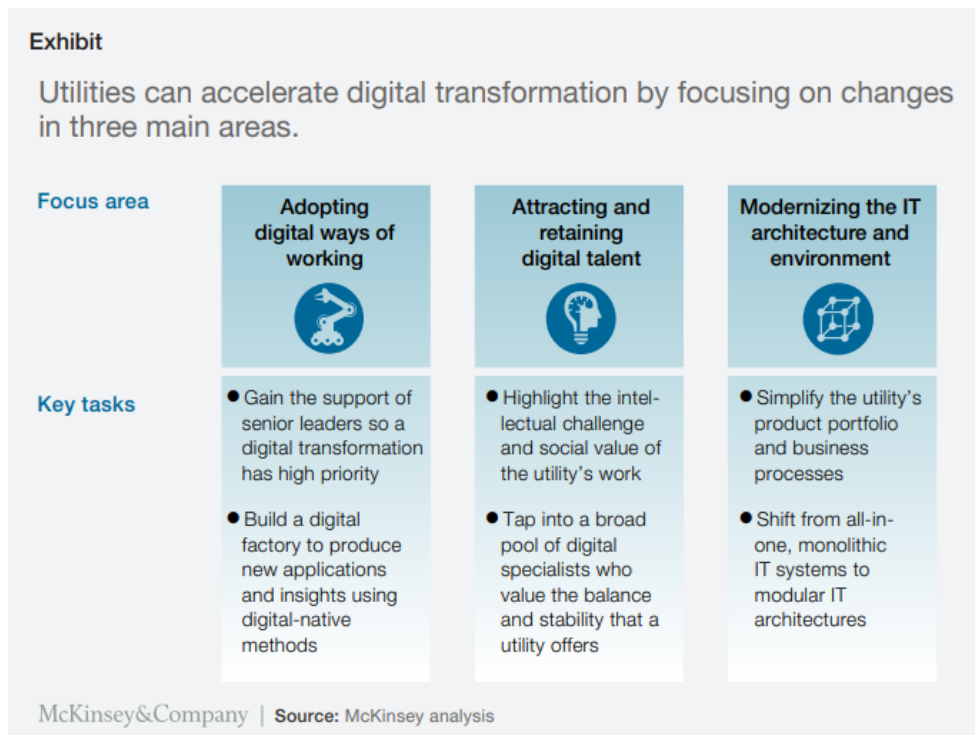


Figure 31. Three main areas to focus for accelerating the digital transformation (Booth et al., 2018).

First, adopting the new ways of working based on agile management methods and practices, including interactions with employees and customers. Therefore, Booth et al.(2018) proposes an effective approach to build an in-house “digital factory” dedicated to producing custom solutions to serve customer’s needs faster. Second, delivering new customized products will require additional digital talent to tackle more assignments. For instance, the organizations will need to attract people to succeed as product owners, designers, DevOps engineers, front-end/full-stack developers, data analytics and machine-learning engineers, data scientists and other digital specialists. Third, a necessary step in modernizing the IT architecture is to streamline the organization operations. A streamlined architecture helps an organization to deliver more services more effectively to faster decision-making.

Shook et al. (2022) refines the future of work by “creating an environment where people feel connected to each other, their leaders and work” where they are seen, heard, able to learn, develop, take new challenges, and advance in their career. This work environment is called “omni-connected”. Figure 32 below shows the four key actions identified by Shook et al (2022) to create an omni-connected work environment.

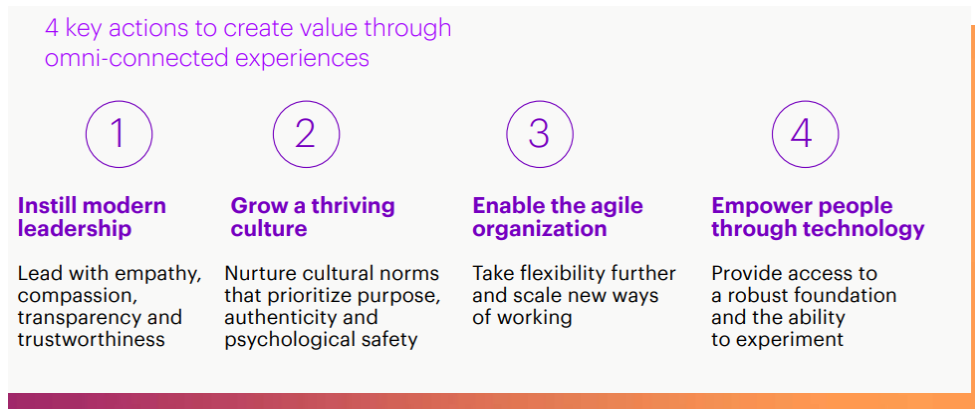


Figure 32. The four key actions to create an omni-connected work environment (Shook et al., 2022).

The four key actions that enable omni-connected employee experiences focus on (1) modern leadership based on transparency and trustworthiness, (2) thriving culture that engages people to expand their skills and grow, (3) agile organization to enable flexibility and new ways of working to be the most productive, and (4) emerging technologies to keep people connected and collaborating.

To better understand how and where Accenture's employees are working after the COVID-19 pandemic, Shook et al. (2022) conducted a "*Care to do better*" research program which reveals that 17% of the employees felt they were benefiting from omni-connected experience at work. Therefore, Accenture started implementing the future of work model called "*Net Better Off*" that enables individuals to work at their full potential and it uncovers six main human needs that contribute to unlocking the individual's potential at work: relational, emotional & mental, physical, financial, purposeful and employable. The Accenture's Chief Leadership and HR Officer, Ellyn Shook and research co-sponsor, David Rodriguez, as cited in Shook et al. (2022), state: "*The pandemic has accelerated what was already in motion: a questioning of relationship between employer and employee.*" The relationship between employees and the workplace has changed in ways that require leaders to engage employees working either in a hybrid or physical workplace balance their productivity, well-being and sense of connection in the evolving future of work. The "*Net Better Off*" model depicted in Figure 33 below provides us with specific best practices in creating new and better ways of working.



Figure 33. The “Net Better Off” model addressing the six fundamental human needs (Shook et al., 2022).

However, Shook et al. (2022) found that 64% of individual’s potential defined by their abilities to use their skills at work, is influenced by the six dimensions of “Net Better Off”, where (1) the financial stability is neither the most powerful nor the most underutilized driver of employee performance, the (2) relational, (3) emotional and (4) purposeful dimensions have the most strongly impact on employees behavior rather than the (5) employability support, while the (6) physical well-being become more important during COVID-19 as a critical driver of employee performance. In the context of “Net Better Off” model, the leaders are provided with actionable steps that they can take to address more dimensions of employee life.

Overall, creating a dynamic organization lies in creating an agile culture and new ways of working in which leaders cultivate an agile mindset to continuously reinforce resources and enhance employee performance.

4.4.3 Analysis of Dynamic organization

An analysis of the key factors to digital transformation success as comprised by dynamic organizations in the best practices and applicable to the case company challenges revealed that creating an agile culture and discover a new way of working are the keys to a successful digital transformation.

First, creating an agile culture that facilitates faster decision making, experimentation and support innovation to continuously reinforce the resources and enhance the employee performance. Creating a culture with high performance and long-range employee satisfaction depends on teams build trust, cross functional collaboration, and communication. (Goran et al., 2017). An agile work culture is also focused on coaching and mentoring, monitoring progress, measuring the performance, peer-to-peer feedback to share ideas or mistakes without the fear of “evaluation” or “performance review”. (Jurisic et al., 2020).

Second, adopting the new ways of working based on agile way of building solutions that can be generalized into robust assets for reuse by other teams, including cross functional interactions across the organization. (Booth et al., 2018). This comprehensive approach can be used at all levels of business by creating an environment where employees feel connected to each other, and well to their leaders and work where they are seen, heard, able to “forge relationships, create both personal and business value and impact, and grow their careers” (Booth et al., 2018).

Third, creating an agile culture and adopting new ways of working require support from senior leaders. Smet et al. (2018) suggests that getting leaders with agile mind-set on board is the secret of successful organizational transformation. Therefore, developing agile leadership capabilities in today’s workplace is necessary to make people feel connected to each other and their work.

If summarized, the following changes would have a significant impact on the organization:

1. Creating an agile culture that facilitates faster decision making, experimentation and support innovation. (Goran et al., 2017).

2. Establishing new ways of working by building a “digital factory” model consisting of robust assets to be reused and continuously improved by other teams through cross functional interactions across the organization. (Booth et al., 2018).
3. Developing an agile leadership and mindset to provide leaders at every level with insights on how to enable the “omni-connected” employee experiences through the future work model, “*Net Better Off*”. (Shook et al., 2022).

Summing up, the digitalization does not change the principles of organizational governance, but since the speed of digital and traditional way of working is so different, leaders might approach digital thoughtfully with consideration for the needs of employees.

4.5 Conceptual Framework of This Thesis

The conceptual framework for this thesis follows the selected three areas and dimensions of digital transformation identified in the Current State Analysis: (1) Operations Optimization, (2) Digital talent and (3) Dynamic organization. Built on top of these three dimensions, the conceptual framework includes three key elements resulted from the best practices that are relevant to support the core theme of this thesis, building a roadmap for digital transformation. The conceptual framework for this thesis is depicted in Figure 34.

The proposal building is structured accordingly, including the barriers on the path to accelerating the digital transformation and suggested solutions to overcome these barriers based on the Data 2 findings.

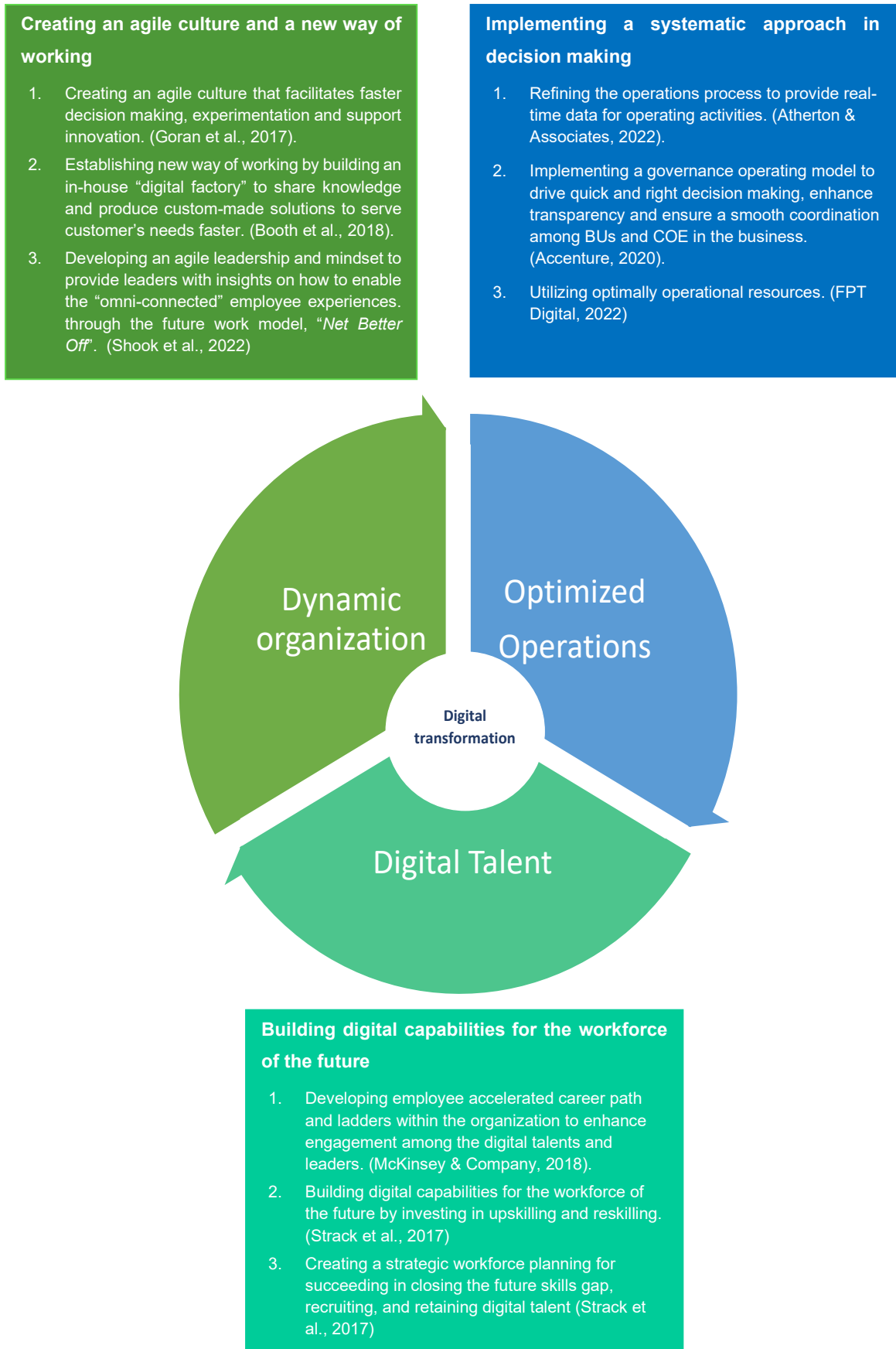


Figure 34. Conceptual Framework of this thesis.

For the roadmap building, the Conceptual framework proposes three key themes for Digital Transformation roadmap in Figure 35 below.

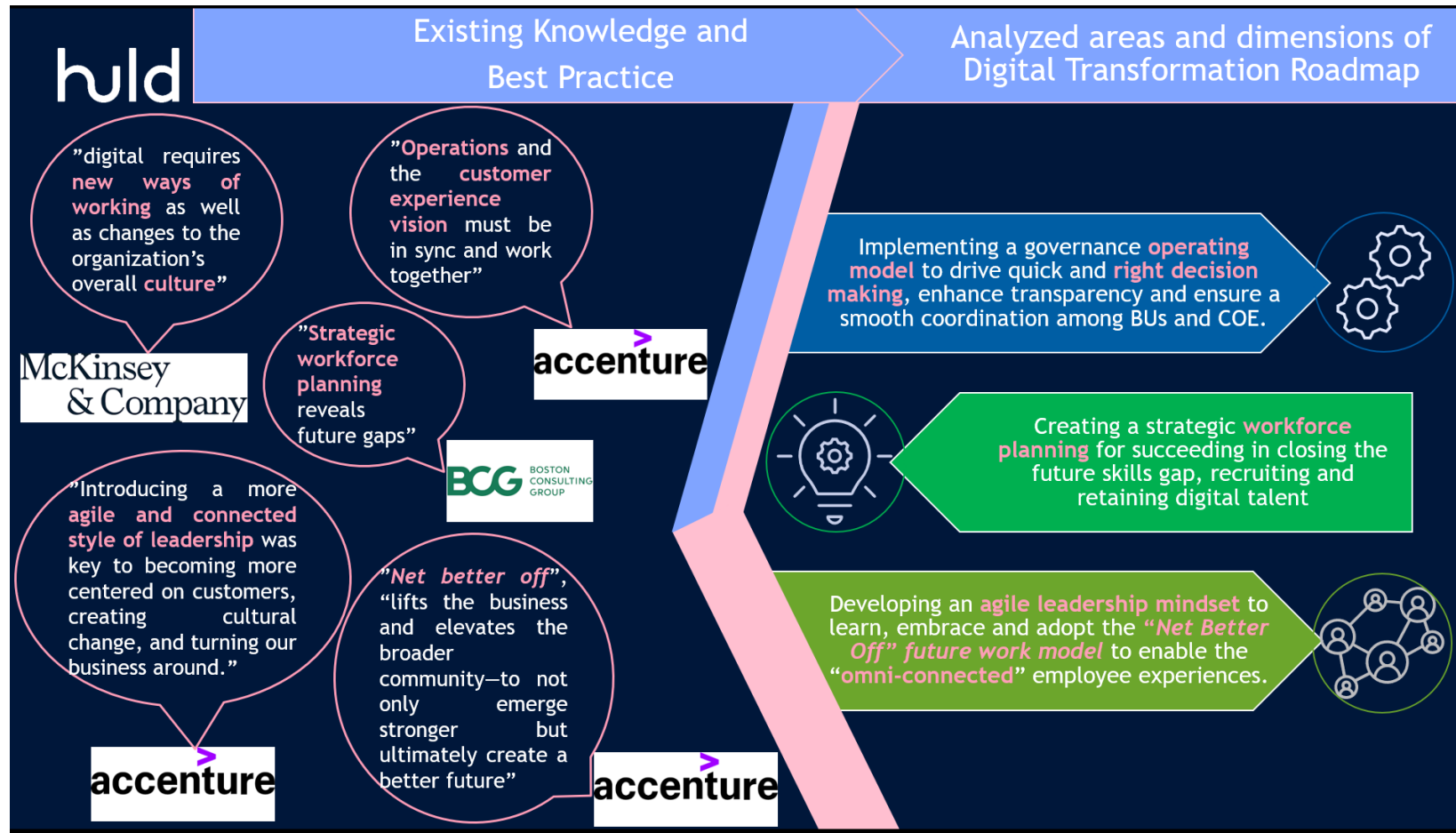


Figure 35. Conceptual Framework proposing the key elements of the Digital transformation roadmap

As highlighted in Figure 35, the Conceptual framework consists of (a) three key *elements* analysed here in Section 4, expanded from (b) the existing knowledge and best practices relevant for this study, and finally (c) the key sources that contributed to the conceptual framework.

The three key elements of the conceptual framework are identified as follows:

1. Operations optimization - Implementing a systematic approach in decision making.
2. Digital talent – Building digital capabilities for the workforce of the future.
3. Dynamic organization – Creating an agile culture and a new way of working.

In the next section, the proposal is built based on the existing knowledge and best practices that were synthesised into the conceptual framework.

5 Building a Proposal for the Digital Transformation Roadmap for the Case Company

This section focuses on the proposal building of the Digital Transformation Roadmap for the case company. The initial proposal was built based on the results from the current state analysis, the existing knowledge and best practices from the conceptual framework, which were introduced in the previous two sections of the thesis. The proposal will be build based on the internal discussions gathered in Data collection 2.

5.1 Overview of the Proposal Building Stage

The goal of this development initiative is to propose a clear and concise set of steps that the case company can follow to achieve short-term and long-term goals in order to accelerate its digital transformation.

The business challenge for the case company is to ensure that its Centers of Excellence succeed to keep up the company's growth and development. The goal is to create a roadmap as a strategic plan to accelerate the digital transformation within Centers of Excellence and thus provide customized solutions for the business needs at the right time.

Based on the best practices and the insights from the current state analysis, the key areas to focus on for building the digital transformation roadmap were identified as the (1) Operations Optimization, (2) Digital talent and (3) Dynamic organization. The proposal building is structured accordingly, including the barriers on the path to accelerating the digital transformation and suggested solutions to overcome these barriers based on the Data 2 findings (Appendix 5).

The Data collection 2 involved internal interviews and brainstorming workshop with the key stakeholders that generated potential solutions and recommendations to the roadmap proposal. The selected key stakeholders were the Huld leaders, Competence technical leads, the Head of Operations and Center of Excellence Directors.

First, the outcomes from current state analysis and conceptual framework were introduced and analytical insights about current digital maturity level were reported using Power BI. Second, the recommendations from the key stakeholders were discussed in detail to understand the current maturity stage of the case company and identify the

barriers on the path to digital transformation acceleration. Third, the key stakeholders came up with suggestions to overcome the barriers, shared and built on each other's ideas in a dynamic brainstorming session. Finally, the collected Data 1 and Data 2 were considered fundamental to building the Digital Transformation roadmap. Thus, the proposal was built based on the Data 1 from CSA with focus on the digital transformation maturity, the key focus areas from CF for building the digital transformation roadmap and also the Data 2 inputs from the brainstorming workshop which are discussed in Section 5.2 below.

5.2 Findings from Data 2 (pulling together CSA, CF and Data 2 for the Proposal)

The fundamental inputs for building the proposal will consist of (1) Data 1 (findings from CSA, earlier), and (2) CF (input from literature), as well as (3) Data 2 (from this co-creation round).

Data Collection 2 concentrates on identifying suggestions from the key stakeholders, proposing solutions to overcome the barriers to accelerating the digital transformation across all three key areas: 1) Dynamic Organization, 2) Digital Talent, and 3) Optimized Operations.

The following table provides the key stakeholders suggestions for the initial proposal in relation to first, the selected focus areas from CSA and, second, to the inputs from literature and best practice. Table 6 below provides the inputs for the proposal.

Table 6. Key stakeholder suggestions (findings of Data 2) for Proposal building in relation to findings from the CSA (Data 1) and the Conceptual framework.

<i>Key focus area from CSA (from Data 1)</i>	<i>Input from literature & best practices (CF)</i>	<i>Suggestions from stakeholders for the Proposal, (from Data 2)</i>	<i>Description of their suggestion (in detail)</i>
<p>1 Operations: Low degree of digitization for decision-making process.</p>	<p>Implementing a systematic approach in decision making that enhances transparency and ensures a smooth coordination among the organization.</p>	<p>a) Use streamline tools. b) Have a systematic process and tool to streamline communication and operations, collaborate more effectively to faster decision-making. c) Have clear pilot cases providing the benefits defined in the best practices.</p>	<p>The stakeholders suggested to setup a systematic process and use integrated tools to streamline the communication and operations.</p>
<p>2 Digital talent: The company does not have a holistic resourcing plan and a roadmap in place to rapidly changing customer expectations.</p>	<p>Creating a strategic workforce planning for succeeding in closing the future skills gap, recruiting, and retaining digital talent.</p>	<p>a) Acquire and adopt the powerful success stories for supporting digital talent. b) Run programs to upskill and train employees to get through the most digitally skills competitors in the market”. c) Developing a holistic workforce plan.</p>	<p>The stakeholders suggested to follow the example of success stories of digital transformation to help case company closing the gap between talent supply and demand, to adapt to future workforce by developing the future skills.</p>
<p>3 Dynamic Organization: The company does not have an agile culture rolled out to drive digital transformation.</p>	<p>Developing an agile leadership and mindset to provide leaders with insights on how to enable the “omni-connected” employee experiences.</p>	<p>a) Develop professional programs for leaders that gives them better understanding of daily actions to build an agile culture and new ways of work. b) Ensure that the benefits of the digital transformation are well understood across BUs and COE.</p>	<p>The stakeholders suggested to provide leaders with practical insights on building an agile culture and seek better ways of working that enable</p>

As seen from Table 6, first, the findings related to Optimizing the operations identified in CSA require to streamline the communication and operations to collaborate more effectively to faster decision-making. Hence, the stakeholders requested that the Element 1 of the proposal to focus on is having a systematic process using tools to streamline the communication between BUs and COEs. These excerpts illustrate a typical view of the participants to the workshop brainstorming activities:

“...There are various tools that may contain same information and do not work well together. We need to use streamline tool either form the same provider, integrating the APIs from existing tools, or create own tools.”
(Respondent 1)

“The targets are agreed but no clear target setting or follow-up of the realized actions. We need to have clear “example” pilot cases proving the benefits.” (Respondent 3).

Second, the inputs from stakeholders for Digital Talent identified in CSA require to develop a holistic workforce plan to recruit and retain digital talent. Hence, the stakeholders requested that the Element 2 of the proposal to focus on developing a workforce plan with innovative ways to attract and retain talent. The participants to the workshop identified the “lack of digital talent in the market”, “not having a long-term recruiting plan” and considering “easier to continue working with legacy ways” as the main barriers to jeopardize the company’s digital transformation journey. To overcome these barriers, the case company needs to “acquire clear and real-life success stories about the new ways of working.” (Respondent 7), “run programs to upskill and train employees to get through the most digitally skills competitors in the market” (Respondent 8) and “developing a holistic workforce plan” (Respondent 9).

Third, the inputs from stakeholders for Dynamic Organization identified in CSA require to create an agile culture and new ways of working. Hence, the stakeholders requested that the Element 3 of the proposal to focus on is developing professional programs for leaders that gives them better understanding of daily actions and behavior needed to build an agile culture and starting to transform the work culture. These excerpts illustrate a typical view of the participants to the workshop brainstorming activities:

“...The upper management is not actively acting as sponsors for the change. We need to elevate the digital transformation as one of the company’s strategical projects.” (Respondent 5)

As the key stakeholders suggested, the case company needs to take clear and effective ways to overcome the barriers on the path to digital acceleration and build a digital transformation roadmap. These include implementing a systematic approach in decision making, building digital capabilities for the workforce of the future and creating an agile culture and a new way of working.

5.3 Proposal Draft / Initial Proposal

The initial proposal evaluates the findings across the selected three areas of the roadmap in which the case company can accelerate its digital transformation. These findings are derived from the evaluation of the company’s digital maturity in the Current State Analysis of digital transformation (section 3.4) and the compilation of the business literature and most relevant best practices by Accenture, Boston Consulting Group (BCG) and McKinsey synthesised in the Conceptual Framework of this thesis (section 4.5).

Upon the evaluation of the key areas, the findings point to three core elements of the initial proposal: (1) the Operations core element that can improve the quality of work and ensure customer satisfaction is the implementation of a Systematic digital approach in decision making, (2) the Digital talent core element that enhances the changes to digital transformation to succeed points to building capabilities for the workforce of the future, and (3) the core element to creating a Dynamic organization lies in creating an agile culture and new ways of working.

Figure 36 shows the overview of the digital transformation roadmap harmonizing the conceptual framework with the current state analysis results, and Data 2 collected from the workshop and discussed with the stakeholders.

Roadmap Framework					
Roadmap elements					Outcome
	Where are we?	How to get there?	Where to be?		
Operations	Implementing systematic digital approach in decision making	Low degree of digitization for decision-making process due to using various tools to manage employee information.	Using streamline integrated tools.	Streamlined communication and operations to collaborate more effectively to faster decision-making.	Optimized Operations
Digital Talents	Building digital capabilities for the workforce of the future	The company does not have a holistic resourcing plan and a roadmap in place to rapidly changing customer expectations.	Developing a holistic workforce plan and recruiting & retaining digital talent.	Streamlined recruiting and hiring process to match the customer needs.	Future Workforce
			Running programs to upskill and train employees for the digital transformation.	Skilled workforce for a competitive market.	
Organization	Agile culture & New way of working	The company does not have an agile culture rolled out to drive digital transformation.	Running an Agile culture professional program.	Leading with and agile mindset.	Dynamic organization
			Building an in-house "digital factory" to share knowledge and produce custom-made solutions to serve customer's needs faster and enable cross functional interactions across the organization.	Cross functional interactions across the organization and respond faster to changing customer needs.	

Figure 36. The Digital Transformation Roadmap for the case company (Initial proposal)

Therefore, the initial proposal for the digital transformation roadmap is built on three key areas: Operations, Digital Talent, and Organization. The core elements synthesize and impact each other in the transformation process. This roadmap is built in connection with the implementation timeline and driven outcomes.

A brief description of three core elements of the initial roadmap is explained in the following sections below.

5.3.1 Element 1 of the Initial Proposal: Operations Optimization – Implementing a systematic approach in decision making

The survey results in the current state analysis revealed that the organization has many manual activities in most of the processes, e.g. production scheduling, forecasting and data is likewise fragmented and often missing or not valid. Furthermore, the processes including administrative tasks are not fully automated and the current CRM tool and business analytics are used with limited capabilities. This customer experience is not leveraged as input for feedback loop into processes.

According to the existing knowledge and best practices, an automated and optimized process can ensure easiest monitoring and faster obtain the information. Moreover, a systematic approach in decision making can drastically reduce the risk from human errors and data loss and also improve data monitoring to keep leaders informed about *employees' performance* or other changes and make decision immediately when it counts.

The evolution of Element 1, Operations Optimization from different phases in the research process is depicted in Figures 37 below.

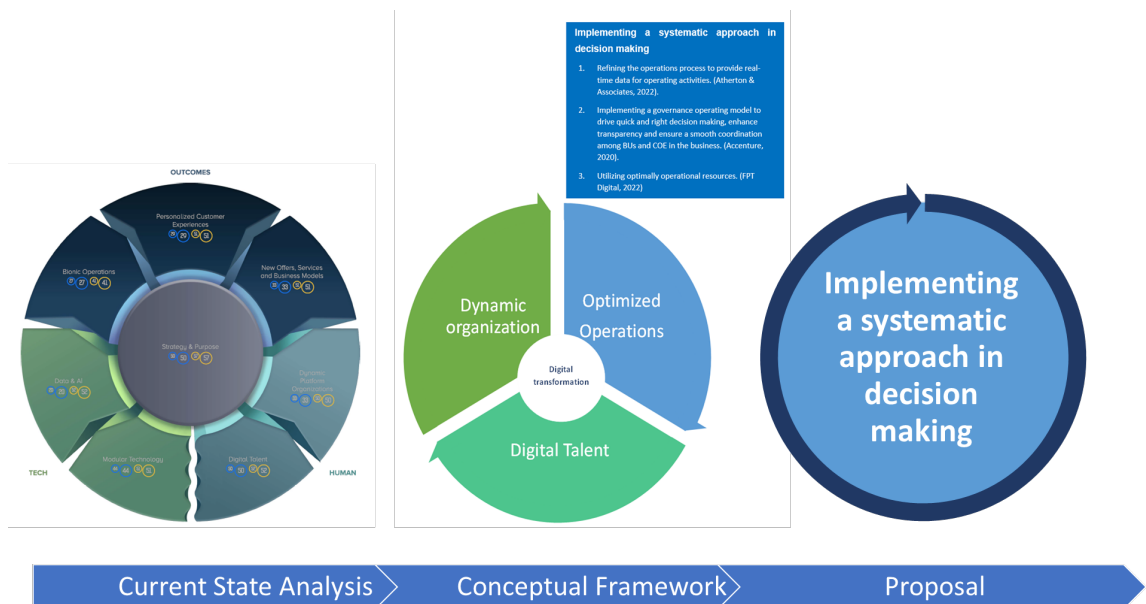


Figure 37. The Evolution from CSA findings to Element 1, Optimized Operations.

As seen in Figure 37, the journey so far has been to drive from wide areas of gaps and ideas as a result of Current State Analysis and literature review to develop clear objectives of establishing the digital transformation maturity level. From there on, the Operations Optimization, as the first key focus area for accelerating the digital transformation, derived and based on the Conceptual Framework along with the findings from Data 2, the required changes were grouped into corresponding core element as part of the initial proposal. The following are proposed steps for the case company to implement a systematic approach in decision making:

1. Refine the operations process for providing real-time reliable data for operating activities syncing with customer experience vision.
2. Implement a governance operating model to ensure a smooth coordination among BUs and COE in the business.
3. Utilize optimally operational resources.

The organization can follow this set of steps to optimize its operations which drive the acceleration of digital transformation.

5.3.2 Element 2 of the Initial Proposal: Digital Talent – Building digital capabilities for the workforce of the future

The findings from the current state analysis revealed that (1) there are no dedicated leaders to manage or drive digital initiatives and (2) the organization onboards digital talents into new roles and has started to adapt towards digital working collaboratively under a good executive guidance. Most of the employees already have the digital skills they need today, but the company does not have a strategic workforce plan.

Based on the existing knowledge and best practices, the digitally talented people are so highly demand that the companies must reinvent themselves to attract them. Therefore, the way to manage with this challenge is to build digital capabilities and develop a strategic workforce plan for succeeding in closing the future skills gap, recruiting, and retaining digital talent. Once the skills gaps are identified, an adequate preparation for the future provides the company with a competitive advantage within its business that will distinguish the successful company from its competitors.

The evolution of Element 2, Digital talent from different phases in the research process is depicted in Figures 38 below.

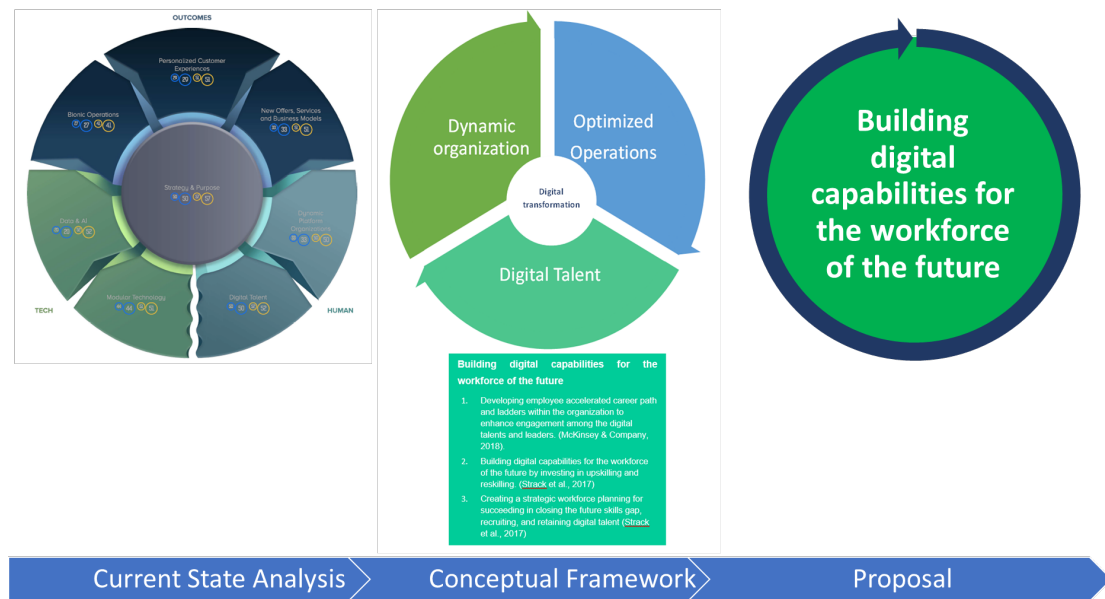


Figure 38. The Evolution from CSA findings to Element 2, Digital Talent.

As seen in Figure 38, the CSA analysis and literature review set out clear objectives of determining the digital transformation maturity level. the Digital talent was identified as the second key focus area for accelerating the digital transformation, based on the CF along with the findings from Data 2. The following are proposed steps for the case company to build digital capabilities for the workforce of the future:

1. Develop employee accelerated career path and ladders to enhance engagement among the digital talents and leaders in the digital transformation journey.
2. Build digital capabilities for the workforce of the future by investing in upskilling and reskilling.
3. Develop a strategic workforce plan for succeeding in closing the future skills gap.

The organization can follow this set of steps to build the capabilities for the workforce of the future which drive the acceleration of digital transformation.

5.3.3 Element 3 of the Initial Proposal: Dynamic Organization – Creating an agile culture and a new way of working

According to the digital acceleration index survey, the company experiments with agile ways of working but there is no agile culture rolled out across businesses to deliver measurable business value and the organizational, governance and technology agility enablers are not addressed.

Furthermore, an agile management of working was suggested from the interviews with stakeholders, that pointed out to the values of knowledge sharing among the employees, in which knowledge about tools, culture, libraries, development environment settings or best practices can be shared.

Based on the existing knowledge and best practices, an agile culture would facilitate faster decision making and support innovation to continuously reinforce the resources and enhance the employee performance. An agile culture depends on teams build trust, cross functional collaboration, and communication. Moreover, the new ways of working based on the agile way of collecting robust assets for reuse can generate personal as well as business value impact.

The evolution of Element 3, Dynamic Organization from different phases in the research process is depicted in Figures 39 below.

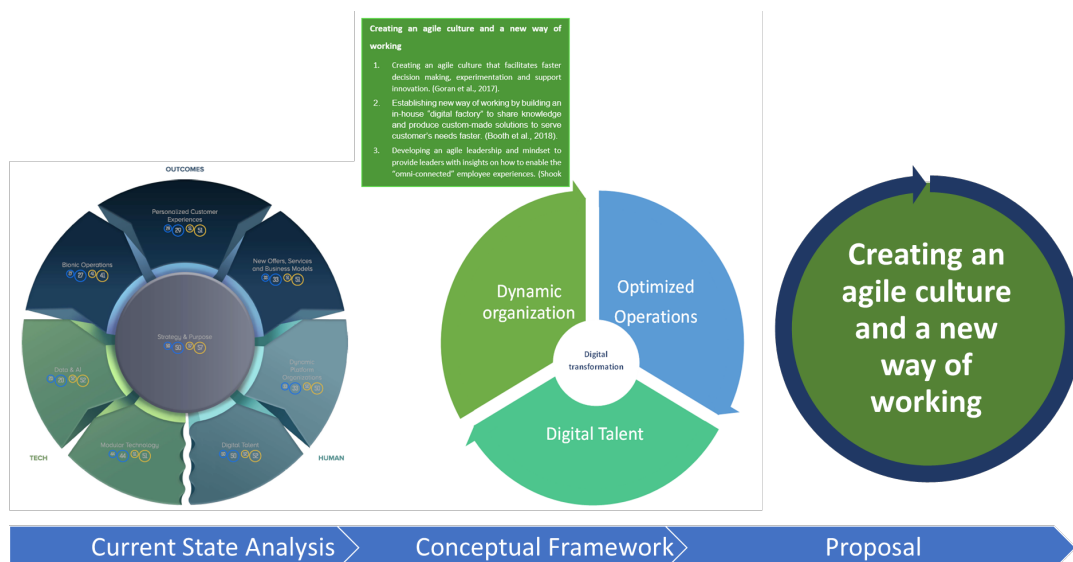


Figure 39. The Evolution from CSA findings to Element 3, Dynamic Organization.

As seen in Figure 39, the CSA analysis and best practices set out clear objectives for the dynamic platform organization, including agile at scale and new ways of working. The Dynamic organization was identified as the third focus area for accelerating the digital transformation, based on the CF along with the findings from Data 2. The following are proposed steps for the case company to create an agile culture and new way of working:

- | |
|--|
| 1. Create an agile culture that facilitates faster decision making, experimentation and support innovation. |
| 2. Establish new way of working by building an in-house “digital factory” to share knowledge and produce custom-made solutions to serve customer’s needs faster. |
| 3. Develop an agile leadership and mindset to provide leaders with insights on how to enable the “omni-connected” employee experiences. |

The organization can follow this set of steps to create an agile culture and implement a new way of working that are imperative for accelerating its digital transformation.

5.4 Summary of the Initial Proposal

This section outlines the three core elements of the digital transformation roadmap for the case company based on the key stakeholders feedback collected in Data 2. Figure 40 shows the initial blueprint of the digital transformation roadmap developed for the case company. The initial proposal presented in Figure 40 below defines the roadmap core elements linked to the proposed timeframe to achieve defined outcomes.



Huld's Digital Transformation Roadmap 1 - 2 years

Element 1: Operations Optimization -Systematic digital approach in decision making						
Task Name	Task Content	Due Date	Priority	Team (drop down)	Type (drop down)	
1. Refine the operations process and tools to streamline the coordination among the organization.	Refining the operations process for providing real-time reliable data for operating activities syncing with customer experience vision.	31.3.2023	HIGH	Top management	Improvement	
2. Implement a governance operating model	Implementing a governance operating model to drive quick and right decision making, enhance transparency in business activities and ensure a smooth coordination among BUs and COE in the business.	31.12.2023	URGENT	CoEs	Improvement	
3. Use optimally the operational resources	Utilizing optimally operational resources.	31.12.2023	URGENT	Huld Leaders	Improvement	
Element 2: Digital Talent - Building digital capabilities for the workforce of the future						
Task Name		Due Date	Priority	Team (drop down)	Type (drop down)	
1. Develop employee accelerated career path	Developing employee accelerated career path and ladders within the organization to enhance engagement among the digital talents and leaders in the digital transformation journey with active transformation initiatives and dedicated full time to a change effort.	30.6.2023	HIGH	Huld Leaders	Improvement	
2. Build digital capabilities for the workforce of the future	Building digital capabilities for the workforce of the future by investing in upskilling and reskilling.	31.12.2023	NORMAL	Competence Leads	Improvement	
3. Develop a strategic workforce plan	Developing a strategic workforce plan for succeeding in closing the future skills gap, recruiting and retaining digital talent.	31.3.2023	HIGH	CoEs	Feature	
Element 3: Dynamic Organization - Creating an agile culture and a new way of working						
Task Name		Due Date	Priority	Team (drop down)	Type (drop down)	
1. Creating an agile culture	Creating an agile culture that facilitates faster decision making, experimentation and support innovation.	30.6.2024	HIGH	Top management	Feature	
2. Establish new ways of working by building a "digital factory" model	Establishing new ways of working by building a "digital factory" model consisting of robust assets to be reused and continuously improved by other teams through cross functional interactions across the organization.	30.6.2023	NORMAL	Competence Leads	Improvement	
3. Develop an agile leadership and mindset	Developing an agile leadership and mindset to provide leaders at every level with insights on how to enable the "omni-connected" employee experiences through the future work model, "Net Better Off".	31.12.2023	NORMAL	Huld Leaders	Improvement	

Figure 40. Initial proposal of the Digital Transformation Roadmap created for leadership team by using ClickUp tool

The proposal for developing the three core elements of the roadmap is built by performing a list of tasks following a timeline and priority order for the responsible teams represented by the Top management, COEs, Huld leaders and competence leads. The timeframe for the roadmap framework depends on the company strategy and availability of resources:

Element 1: Operations Optimization – Implementing a systematic digital approach in decision making	Expected implementation time is 1 year.
Element 2: Digital Talent – Building digital capabilities for the workforce of the future	Expected implementation time 1 year.
Element 3: Dynamic Organization – Creating an agile culture and a new way of working	Expected implementation time in 1-2 years.

Based on the suggestions received from the key stakeholders, the roadmap will be built following the tasks priorities for all three core elements.

The proposal addresses the needs and targets of the case company and provides a roadmap as a strategic planning and implementation of the digital transformation.

This proposal is a baseline version accepted by case company to further plan and come up with detailed activities applicable to the organization as well as to enable their implementation. Therefore, the roadmap will be validated in the third context by the key stakeholders and the feedback will be evaluated and actioned in the next chapter.

6 Validation of the Proposal

This section reports on the results of the feedback and validation of the initial proposal developed in Section 5. First, an overview of the proposal shows the logic of performing the validation phase. Second, the findings from Data collection 3 and further developments are discussed separately for each core element of the Roadmap Proposal. Third, the Final proposal for the Digital Transformation Roadmap is presented.

6.1 Overview of the Validation Stage

The purpose of validation stage was to conduct a feasibility testing of the roadmap to ensure the reliability of the proposal and get an idea of how achievable the roadmap implementation is. For this end, the key stakeholders represented by COE Director, Head of operations, Huld leaders and competence leads have provided their expert judgement of the Initial proposal. The validation stage focused on the three core elements that form the basis of the roadmap with the planned timeframe. In addition, the abstract of the thesis was presented to the key stakeholder to provide them with a broad overview of what the research was about, what are the outputs of the research and concluding with their benefits for the company.

The recommendations from the key stakeholders (gathered and analysed as Data 3) provided the basis for undertaken improvements to the Initial proposal.

The validation of the proposal was conducted in two phases. First, the initial proposal was presented individually to the COE Director and to the group of team leaders, competence leads and Head of operations. These key stakeholders brought the most valuable insights as they have leadership experience, and they are behind all decisions and daily interactions across company. Second, the key stakeholders were requested to assess the initial proposal and provide recommendations.

All recommendations from the stakeholders related to the three core elements of the roadmap with the planned timeframe were discussed and written down to be considered as further improvements in building the final proposal. Based on the comments and recommendations, the final proposal for the roadmap was created.

6.2 Developments to the Proposal (based on Data Collection 3)

Throughout the validation session, the inputs and development improvements received from the key stakeholders were discussed.

The feedback from the COE Director was that the research covered relevant key areas that can make company business moving forward.

“The defined roadmap makes sense, and it is valuable for us to implement it and bring things forward.” (COE Director, November 2022)

As a recommendation, exemplifying the actions through the use of digital transformation roadmap, the new concepts and tools names would be much easier for the management team to interpret the roadmap.

The feedback from team leaders and competence leads was limited to the timeframe due to the different level of complexity to implement the defined tasks:

“Well, I think people don't want to grasp the idea of ticking clock on implementing the tasks. It's important to estimate how complex the task is, because if we have to cope with the “low hanging fruit”, then it will be easier just to accomplish the task and celebrate the accomplishment. But we have some tasks that are more complex, and they will take a lot of resources and time.” (Huld leader, November 2022)

Therefore, the complexity of the tasks has been assessed more carefully, so the timeframe of 1-2 years for the roadmap would require to be extended to 2-3 years.

Next sub-sections clearly state the feedback provided by experts to further develop the core elements of the Initial proposal.

6.2.1 Developments to Element 1 of the Initial Proposal: Operations Optimization – Implementing a systematic approach in decision making

The development suggestions to the Operations Optimization on implementing a systematic approach in decision-making pointed to the tools involved in the operations

process. The experts suggested that an assessment of the tools to support the decision-making should be added to the operations tasks of the Initial roadmap proposal. The complexity of tasks and resources risk to accomplish the tasks within the proposed timeframe concerned for the key stakeholders.

The key feedback areas with the inputs from the validation discussion are summarised in Table 7 below.

Table 7. Summary of the findings from Data 3 collected in the validation of the Element 1 of the initial Proposal.

<i>Elements of the Initial Roadmap proposal</i>	<i>Parts commented in Validation</i>	<i>Description of the comment/ feedback by experts (in detail)</i>	<i>Development to the Initial Roadmap proposal</i>
1 Operations Optimization – Implementing a systematic digital approach in decision making	a) Refine the operations process for providing real-time reliable data for operating activities syncing with customer experience vision.	The experts suggested to add the assessment of tools that can be used in decision making.	The assessment of the decision-making tools is included in the existing operations tasks of the roadmap.
	b) Implement a governance operating model to ensure a smooth coordination among BUs and COE in the business.	Confirmed. Minor fixes with timeframe emphasizing on the due date.	The timeframe is updated to allow management team to successfully accomplish the task.
	c) Utilize optimally operational resources.	Confirmed. Minor fixes with timeframe emphasizing on the due date.	The timeframe is updated to allow management team to successfully accomplish the task.

Table 7 above summarizes the inputs from the key stakeholders collected during the validation of the Initial proposal. The stakeholders confirmed that the Initial proposal had comprehensible steps for the case company to implement a systematic approach in decision making:

“The operations process actually affects our everyday working lives. I think the proposal for the operation optimization has been really well defined and we need to take these actions and implement.” (COE Head of operations, November 2022)

Following the valuable recommendations, the assessment of the decision-making tools was added, and the timeframe was increased to allow management team to successfully accomplish the tasks.

6.2.2 Developments to Elements 2 of the Initial Proposal: Digital Talent – Building digital capabilities for the workforce of the future

The proposed steps in building the digital capabilities for the workforce of the future were approved in the evaluation of the initial roadmap proposal. The key stakeholders were concerned about the short timeframe to reach the proposed goals suggesting to setup a realistic timeframe to successfully accomplish the proposed tasks.

Table 8 below provides the key feedback areas with the inputs from the validation discussion.

Table 8. Summary of the findings from Data 3 collected in the validation of the Element 2 of the initial Proposal.

<i>Elements of the Initial Roadmap proposal</i>	<i>Parts commented in Validation</i>	<i>Description of the comment/ feedback by experts (in detail)</i>	<i>Development to the Initial Roadmap proposal</i>
2 Digital Talent – Building digital capabilities for the workforce of the future	a) Develop employee accelerated career path and ladders to enhance engagement among the digital talents and leaders in the digital transformation journey.	Confirmed. Minor fixes with timeframe emphasizing on the due date.	The timeframe is updated to allow management team to successfully accomplish the task.
	b) Build digital capabilities for the workforce of the future by investing in upskilling and reskilling.	Confirmed. Minor fixes with timeframe emphasizing on the due date.	The timeframe is updated to allow management team to successfully accomplish the task.
	c) Develop a strategic workforce plan for succeeding in closing the future skills gap.	Confirmed. Minor fixes with timeframe emphasizing on the due date.	The timeframe is updated to allow management team to successfully accomplish the task.

As seen from Table 8, the Digital talent perspective on building digital capabilities for the workforce of the future did not receive any major suggestions. The stakeholders confirmed that the proposed roadmap has clear steps for the case company to build the workforce of the future and decided to implement them immediately:

“We have tried for a few years to have a workforce plan, building up a skills bank for this company that is under the competence development management and planning what kind of competencies are needed. The inputs are expected from the business units, but quite often they are not able to give kind of a precise inputs. We are using quite ad-hoc environments and doing manual work. Instead of that, we would need to build this workforce plan based on the market insights on what kind of workforce do we actually need in the future.” (COE Director, November 2022)

Following the suggestions from the key stakeholders, the timeframe, resources and cost factors needed a rigorous evaluation and adjustments to allow leadership team to successfully accomplish the tasks.

6.2.3 Developments to Elements 3 of the Initial Proposal: Dynamic Organization – Creating an agile culture and a new way of working

The Dynamic organization perspective of the roadmap was agreed to include the steps defined in the initial proposal. New concepts and framework models from the best practices were presented to the key stakeholders during the validation and they recommended to introduce them into an initial phase prior starting to implement the roadmap. This will require setting up a realistic timeframe to successfully accomplish the additional task.

Table 9 below provides the key feedback areas with the inputs from the validation discussion.

Table 9. Summary of the findings from Data 3 collected in the validation of the Element 3 of the initial Proposal.

	<i>Elements of the Initial Roadmap proposal</i>	<i>Parts commented in Validation</i>	<i>Description of the comment/ feedback by experts (in detail)</i>	<i>Development to the Initial Roadmap proposal</i>
3	Dynamic Organization – Creating an agile culture and a new way of working	a) Create an agile culture that facilitates faster decision making, experimentation and support innovation.	Confirmed. Minor fixes with timeframe emphasizing on the due date.	The timeframe is updated to allow management team to successfully accomplish the task.
		b) Establish new way of working by building an in-house “digital factory” to share knowledge and produce custom-made solutions to serve customer’s needs faster.	The experts recommended to introduce the new concepts and frameworks used in defining the digital transformation roadmap to help the management team easily interpret the roadmap.	An initial phase is added to the roadmap for introducing the new concepts and frameworks.
		c) Develop an agile leadership and mindset to provide leaders with insights on how to enable the “omni-connected” employee experiences.	The experts recommended to introduce the new concepts and frameworks used in defining the digital transformation roadmap to help the management team easily interpret the roadmap.	An initial phase is added to the roadmap for introducing the new concepts and frameworks.

Table 9 above summarizes the suggestions from the key stakeholders to the initial proposal development. The key stakeholders agreed that the initial proposal provided comprehensive plans and actions to create an agile culture and a new way of working:

“I fully agree with that statement that we must find new ways of doing things. ... And it highlights the importance of actions to implement not only informal, but we would actually have someone with the responsibility to drive things forward.” (COE Director, November 2022)

To help the management team easily interpret the roadmap, an additional task was added to the roadmap for introducing the new concepts and frameworks models used in defining the digital transformation roadmap.

The stakeholders agreed that the roadmap is set to be implemented immediately, and the timeframe and resources responsible for implementing it should be carefully monitored. The created roadmap includes a detailed description of each element and tasks name, description, schedule, priority, and responsible teams such as COE, Huld leaders, Competence leads, Top management tagged. Thus, the proposal should provide complete details for each element of the roadmap and act as a reference plan for the management team to implement the digital transformation roadmap for the case company.

“It’s a concrete proposal because that’s what the management team needs. So, yes, we have identified an issue and then you have identified the way how to solve it. And I think it’s been much easier to advance things when we have an idea of a solution. And even the owner, who will take care of implementing these things, I think that it would be quite natural to proceed with.” (COE Director, November 2022)

6.3 Final Proposal

This section presents the final proposal of the digital transformation roadmap after the discussion and feedback on the initial proposal. The initial proposal was revised, and the changes based on the feedback and suggestions from the key stakeholders were implemented in the final proposal.

The final proposal of the roadmap to digital transformation is presented in Figure 41 below.



Huld's Digital Transformation Roadmap 2 - 3 years

Element 1: Operations Optimization -Systematic digital approach in decision making						
Task Name	Task Content	Due Date	Priority	Team (drop down)	Type (drop down)	
1. Refine the operations process and assess the tools to streamline the coordination among the organization.	Refining the operations process and tools assessment for providing real-time reliable data for operating activities syncing with customer experience vision.	31.3.2023	HIGH	Top management	Improvement	
2. Implement a governance operating model	Implementing a governance operating model to drive quick and right decision making, enhance transparency in business activities and ensure a smooth coordination among BUs and COE in the business.	30.6.2024	URGENT	CoEs	Improvement	
3. Use optimally the operational resources	Utilizing optimally operational resources.	30.6.2024	URGENT	Huld Leaders	Improvement	
Element 2: Digital Talent - Building digital capabilities for the workforce of the future						
Task Name		Due Date	Priority	Team (drop down)	Type (drop down)	
1. Develop employee accelerated career path	Developing employee accelerated career path and ladders within the organization to enhance engagement among the digital talents and leaders in the digital transformation journey with active transformation initiatives and dedicated full time to a change effort.	31.12.2024	HIGH	Huld Leaders	Improvement	
2. Build digital capabilities for the workforce of the future	Building digital capabilities for the workforce of the future by investing in upskilling and reskilling.	30.6.2025	NORMAL	Competence Leads	Improvement	
3. Develop a strategic workforce plan	Developing a strategic workforce plan for succeeding in closing the future skills gap, recruiting and retaining digital talent.	30.6.2023	HIGH	CoEs	Feature	
Element 3: Dynamic Organization - Creating an agile culture and a new way of working						
Task Name		Due Date	Priority	Team (drop down)	Type (drop down)	
1. Create an agile culture	Creating an agile culture that facilitates faster decision making, experimentation and support innovation.	31.3.24	HIGH	Top management	Feature	
2. Establish new ways of working by building a "digital factory" model	Establishing new ways of working by building a "digital factory" model consisting of robust assets to be reused and continuously improved by other teams through cross functional interactions across the organization.	31.3.25	NORMAL	Competence Leads	Improvement	
3. Develop an agile leadership and mindset	Developing an agile leadership and mindset to provide leaders at every level with insights on how to enable the "omni-connected" employee experiences through the future work model, "Net Better Off".	30.6.25	NORMAL	Huld Leaders	Improvement	
4. Introduction into new concepts and frameworks from best practices	The experts recommended to introduce the new concepts and frameworks used in the best practices for defining the digital transformation roadmap to help the management team easily interpret the roadmap.	31.3.23	URGENT	CoEs	Feature	

Figure 41. Final Proposal of the Digital Transformation Roadmap created for leadership team by using ClickUp tool

As seen from Figure 41, the final proposal includes *the core elements* of the proposed roadmap with corresponding steps to be implemented. The developments to these core elements were mainly focused on providing accurate description to the roadmap elements and other entities involved in the implementation of the final proposal.

The roadmap created by using the ClickUp tool gives a practical approach to implementation of defined tasks including the type of features, the team responsible for implementing the specific tasks along with their priority and due date.

It is recommended that the steps suggested above are taken into action to ensure a smooth and effective implementation of the roadmap framework into practice.

7 Conclusion

This section summarizes the key findings of this study. The executive summary describes the main steps and results of the study. Then, next steps towards implementation are proposed. Finally, the quality of research results are discussed and the outcome of this thesis is evaluated.

7.1 Executive Summary

The goal of this study was to propose a digital transformation roadmap for the case company which would enable it to continuously innovate, become more responsive to the evolving customer needs and acquire capabilities successfully through Centers of Excellence to stay ahead of digital changes. The roadmap should visualize the core elements that support the digital transformation with a defined timeframe for implementing and achieving the desired outcomes.

The research process in this Thesis was conducted by utilizing the applied action research and qualitative research method. By using the applied action research, the research and development process were combined to solve a practical challenge which typically relates to continuous enhancement and improvement in organization. The data collection involved qualitative research methods through questionnaires, interviews, publications, and workshops.

By assessing the current state of the existing digital transformation maturity of the case company, the study qualified the case company as a *digital literate* that is aware about digital systems as an opportunity to speed up and optimize the operations as well as changing the way of working without having a well-defined digital strategy and roadmap to execute the digital vision. Thus, an integrated overall digital transformation journey has not been defined and a roadmap has not been developed yet to reach company's digital ambition. Furthermore, the key findings from the current state analysis (gathered from analysing Data 1) point first, to the strengths and the weaknesses of the case company and, second, to the most relevant areas as necessary blocks for *building a roadmap to digital transformation for the case company*.

The available literature and best practice for creating a roadmap to digital transformation identified relevant guidance for building such a roadmap. An effective way for achieving better business outcomes is looking at the best practices the leaders as Accenture, Boston Consulting Group (BCG) and McKinsey operate in accelerating digital transformation across their organization and to introduce their processes and ways of working into the case company. As a result of best practices review and the current state analysis, the key areas to focus on for building the digital transformation roadmap were identified as the (1) Operations Optimization, (2) Digital talent and (3) Dynamic organization.

The initial proposal identified the barriers on the path to accelerating the digital transformation and the solutions to overcome these barriers across the selected three areas of the roadmap. These findings were brainstormed in a workshop and the inputs provided by the key stakeholders were collected as Data 2 findings. The findings point to three core elements of the initial proposal: (1) the Operations element that can enhance the cross collaboration between BUs and COEs is the implementation of a Systematic digital approach in decision making, (2) the Digital talent element that enhances the changes to digital transformation to succeed points to building capabilities for the workforce of the future, and (3) the Dynamic organization element resides in creating an agile culture and new ways of working. These core elements defined the roadmap over a proposed timeframe to achieve the required outcomes.

The initial proposal was analyzed and validated by the key stakeholders. The benefits for each element of the roadmap and timeframe to implement the roadmap were discussed and the inputs were collected as Data 3. Based on the recommendations provided by the key stakeholders, the requested improvements were made, and the final proposal was developed.

The Leadership team assessed the impact of proposed roadmap and brainstormed the implementation process as well as its risk factors. Though the initial timeframe of the roadmap implementation for the case company was the next 1-2 years, the different complexity level of the proposed tasks was considered a challenge to the effective implementation of the roadmap in a such a short period of time. So, the timeframe was increased to a more realistic 2–3 years plan.

The implementation plan of the proposed digital transformation roadmap by the case company will help the case company to better overcome the barriers to accelerate the digital transformation and continuously innovate to stay ahead of changes.

7.2 Managerial Implications (Next Steps and Recommendations toward Implementation)

The roadmap is created to support leaders and management making decisions regarding future development processes, workforce planning, building capabilities and strategy work. There will be a Digital transformation program started in the beginning of 2023 that will help in prioritizing the tasks, defining the eventual sub-tasks and responsibilities to drive things forward.

Further steps towards the final proposal implementation can be considered as follows. First, the implementation of the roadmap framework started already to be implemented in the Digital talent area. With the main implication of company's leaders, a skills bank company tool has been developed to identify the digital talent gap. The skills bank started to be tested and currently holds almost all employees' information based on the competences and skill level, with the plan to fulfil this tool and setup the integration with the resourcing allocation tool used by the case company.

Thus, closing the gap between talent resources and customer demand, depends first, on individual digital talent actions to add and maintain their skills profile and second, on leadership team to identify the needs for upskilling and reskilling to build the digital capabilities for the workforce of the future. Now that the skills bank tool has been tested, the COE should emphasize its value and benefits to engage the digital talent and BUs to adopt the new tool.

Further features such as statistical snapshot of effective skills development and recommended skills to succeed in the role can be added to the Skills bank tool to cover the proposed three steps to build digital capabilities for the workforce of the future.

Second, the steps to making an effective decision can be introduced to the leaders and managers to further clarify the meaning of systematic approach in decision making. In addition, an assessment of the effective tools to be used in decision making will allow BUs and COE to execute smooth coordination in the business.

Third, new concepts and models are addressed to help management team get a clear understanding of them and easily interpret the roadmap.

The tasks details and implementation progress of each roadmap element is carefully monitored based on development milestones. The responsible teams for implementing the assigned action items to build the roadmap are agreed. The most potentially impactful risks involved with the roadmap implementation include the resources availability, financial constraints, and organizational changes. To mitigate the risk factors that arise due to limited resources and financial constraints, a common approach is agreed with the responsible team to prioritizing the roadmap action items across shared resources and consistent monitoring of the budget is foreseen.

7.3 Thesis Evaluation

The objective of this Master's Thesis was to create a roadmap to accelerate the digital transformation within Centers of Excellence. The expected outcome of this study was a step-by-step roadmap as a strategic plan to accelerate the digital transformation for the case company.

The main purpose of creating this roadmap was to provide the case company with a comprehensive tool that allows to take the right steps to overcome the barriers to digital transformation and continuously innovate to stay ahead of digital changes.

During the research, the roadmap was developed and then resulted into three core elements that were equally addressed in this study. The resulting roadmap can now be used by the case company, as well as by similar organizations willing to adopt digital transformation as part of their business strategy.

The research method helped the study to proceed according to the iterative stages, and to reach the objective of the Thesis in the most effective way. The collected data was gathered in accordance with the research method and provided by the most relevant stakeholders via conducted questionnaires, interviews, workshops, and discussions in order to collect the best data and analyze it correctly.

The current state analysis pointed to the main strengths and weaknesses identified in the assessment process of the case company. It helped to better understand the needs and opportunities of the key stakeholders and customer expectations. The literature review helped in acquiring the knowledge and best practices from the leader organizations that operate in accelerating digital transformation.

The digital transformation roadmap was the outcome of extensive discussions held with the COE Director, Head of Operations, team leaders and competence managers. The initial proposal was improved based on the development suggestions provided by the key stakeholders during the validation stage. To mitigate the key stakeholders concern about the complexity of some of the proposed elements to be implemented within this roadmap, the timeframe was increased accordingly to allow management team implementing and achieving the desired outcomes.

7.4 Closing Words

This Thesis emphasized the importance of building a step-by-step roadmap for the case company as a strategic plan to accelerate the digital transformation within Centers of Excellence. The proposed roadmap was built based on a comprehensive analysis resulted into three core elements of the roadmap that were equally addressed.

Rather than finding solutions to an already existing problem, the hardest part in doing this research was to identify the challenges which the case company may encounter in the future and for that it needs to be prepared take the right steps to overcome the barriers to digital transformation, imagine the future and continuously innovate to stay ahead of changes.

The digital transformation has different shapes and areas, depending on the needs of the business and industry requirements. The core of digital transformation is not the tools or technology. It is a cultural change, optimized operations, and the capabilities for the workforce of the future along with a leadership mindset that allow companies to become agile and more responsive to the constantly evolving customer needs.

The roadmap maps out a high-level plan, defining the major steps to develop a clear path to the acceleration of digital transformation as part of Huld Ltd growth strategy.

I believe that the implementation of the actions outlined by this roadmap will enhance the culture, the operations, and capabilities for the workforce of the future, making Huld a *digital performer* that builds digital proficiency and coordinate the capabilities successfully. This phenomenon is called *acceleration of digital transformation*.

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Appendix 1: BCG's Digital Acceleration Index Questionnaire (Data collection 1). Based on BCG (2020).

Digital Acceleration Index

The survey will take approximately 25 minutes to complete.

Welcome to Huld Digital Acceleration Index survey.

Technology is accelerating at a dramatic pace, people are changing their ways of working, and customer demands are shifting. Blending human and technological capabilities takes Huld beyond tomorrow to achieve superior outcomes. This survey helps our company assess its digital maturity level and build a roadmap for digital transformation acceleration. Please provide your answers to your best available knowledge.

* Required

PERSONALIZED CUSTOMER EXPERIENCE

Leverage data and AI to build one-to-one customer offers and interactions

1. To what degree are you using digital tools and digital-supported processes to improve the research & product development function? *

Research & product development

- We use simple digital development tools with limited integration and classical processes for operations feedback. We largely follow standard waterfall development methodologies.
- We currently evaluate scenarios on how to improve R&D with digital and run first pilot projects. We have started to integrate/harmonize our development data and have first teams using rapid development methods.
- We use End-to-End (E2E) development processes with strong tool support and Product Data Management (PDM) data backbone. We pilot analytics use cases for faster operations feedback. We have first lighthouse projects to speed up R&D, e.g., via 3D-printed prototypes. Agile is standard in our innovation process, and we use external collaboration.
- Our agile development processes and data are integrated to get early feedback from operations. Fast and low-cost prototyping is tool-supported E2E (e.g., simulation and 3D printing). We have built and we leverage AI capabilities to become more innovative.
- I don't know.

2. How do you target customers via digital channels, and how do you run a digital marketing operating model? *

Digital marketing

- Our digital assets (sites, apps) are fragmented with limited traffic; we are behind our competitors in terms of digital presence; we do not feel we have significant control over digital marketing execution.
- We have adapted our investment mix to focus on the touchpoints that matter along the consumer decision journey but do not feel we are able to effectively track and optimize its execution and ROI; we have digital-marketing experts locally but siloed next to "traditional" marketers; we experiment with data-driven targeting and personalization.
- A significant share of our consumer activation is in micro-segments, based on audience profiles but also context; we get significant visibility from digital advocacy and influence; we have transparent access to data and technology as well as digital experts that can effectively challenge agencies on digital-campaign execution.
- We have clear measurement of the incremental ROI of our digital marketing; we have direct personalized relationships with a significant part of our consumers; digital is a core skill of all marketers in the company; there is effective collaboration between marketing, media, agency, and technology teams to design impactful consumer engagement strategies.
- I don't know.

3. Do you leverage data and use advanced analytics to deliver a 1:1 personalized experience to customers in a scalable, cost-efficient way? *

Personalization

- We communicate with our customers in segments and lack a strategic agenda for personalization. We miss full data availability, analytic capabilities, and the technology to support personalization at scale.
- We started engaging with customer micro-segments, as our current technology only supports the deployment of limited variants, and our targeting analytics is based on simple business rules.
- We can deliver 1:1 tailored experiences in individual channels and for different stages in the customer life cycle. We are able to perform the required analytics and deployment in near real time but cannot scale up to a cross-channel experience yet. We do have a long-term strategy and a roadmap in place.
- We are delivering fully individualized experiences to our customers across channels and in real time. Our analytics is enhanced by deep learning (AI), and the full marketing technology stack to enable further value optimization via continuous testing is implemented. Our platform is scalable.
- I don't know.

4. How do you optimize and integrate your sales channels and processes (incl. payment and fulfillment) using digital technologies and analytics? *

Next-generation sales

- Individual channels get optimized in silos. Overall stronger focus on product rather than sales improvements.
- Omnichannel integration is currently implemented, and new concepts are explored, e.g., digital stores, inside sales, e-commerce, and customer success.
- Omnichannel sales with highly effective sales force supported by CRM. Data not yet exploited to the full potential.
- Highly automated and omnichannel sales. Rich data is used to prioritize leads, AI/ML, technologies are applied.
- I don't know.

5. Do you improve your pricing by applying digital and data-driven technologies and thus gain competitive advantage? *

Digitally driven pricing

- Basic pricing principles are applied, and only rudimentary pricing tools are in place.
- Deploying advanced-analytics tools to optimize pricing, based on segment-specific willingness to pay. Omnichannel pricing process is in place.
- Advanced analytics tools and ML are in place to optimize pricing and enable an omnichannel dynamic pricing process. Personalized and differentiated pricing by micro-segments is continuously recalibrated.
- Fully digital-enabled, advanced, omnichannel, personalized, and dynamic pricing tools are in place, fully automated with ML.
- I don't know.

6. What is your current approach in consistently defining the best-in-class customer experience through digital? *

E2E customer journeys

- We have a small team that focuses on changing the customer journey by addressing key pain points.
- We understand the customer (pain points and unmet needs) and work together in identifying new opportunities to improve the customer journey.
- We reinvent customer journeys E2E and use digital technologies to deliver differentiated customer experiences. We start to develop measures along the customer journey to track satisfaction.
- We have full insight into our customers and design best-in-class engagements. Digital processes are in place to track customer satisfaction and react in order to improve customer experience.
- I don't know.

7. Are digital interactions leveraged substantially? Is each customer service channel (call center, web, app, mail, e-mail, chat, etc.) optimized for efficiency and effectiveness using digital technologies? *

Customer services

- Predominant interaction channels are physical; no use of digital or self-service tools in front-end (e.g., chat bots, IVR) and in back-end functions. Reactive customer service.
- Traditional digital channels (web, app) are in place (with room to improve from quality point of view) and with substantial share (10-30%); initial pilots in applying digital tools (esp. robotics) in back office.
- Traditional digital channels are optimized from customer experience point of view, strong share (30-50%). Pilots in front end (AI, biometric voice identification) as well as delivery (e.g., affinity matching of agents).
- Mix of contact channels (physical/nonphysical) fully optimized, typically high share (> 70% of digital interactions). Largely proactive service (anticipating complaints). Digital tools fully exploited to maximize efficiency and effectiveness (e.g., upselling) of each customer interaction.
- I don't know.

NEW OFFERS, SERVICES and BUSINESS MODELS

Disrupt the market and yourself with agile, business-building teams driving innovation at speed and scale

8. How does your organization foster digital innovation, identify opportunities and white spaces, and develop and commercialize new digital offers? *

New digital services/products

- We just started to foster digital innovation between product managers and customers to identify new digital value pools.
- We have started to complement our core offerings with digital services. We have started to experiment with consumer-led innovation and to identify new value pools but rather ad hoc, not really structured.
- We have led most of our core offerings into the digital space, and we digitally enhanced the remaining non-digital offerings. We launch new products (value pools) quickly.
- We monitor the markets and new incumbents, and proactively innovate our core offerings to become digital. We are very early in the market with integrated offers (fast time-to-market).
- I don't know.

9. How aggressive are you in trying to revolutionize your own industry? *

Degree of digital disruption

- We are disrupting our customer journeys but currently just for the same products.
- We are disrupting our product offering and customer experience.
- We are disrupting our business model and inventing new businesses, and we are on the way to profitability.
- We have successfully launched a digital disrupter in our industry which is profitable. We have entered adjacent markets with new offers.
- I don't know.

10. How do you mobilize your organization for digital? *

Lighthouses & prototyping

- Our people know digital disruption is a priority.
- We experiment with prototyping to set teams in motion in an agile way and to validate the feasibility of a potential product.
- Several times we have used lighthouses and prototypes resulting in our employees, clients, and shareholders being proud of the organization. We have a strong experimental mindset.
- Lighthouse projects and minimum viable products (MVPs) set the direction of where digital evolves in our organization; they are well recognized externally and also serve to promote the potential of digital corporate-wide.
- I don't know.

11. How do you capture the value and the business coming from disruptive digital organizations? *

Start-up incubation, VC, M&A

- We are benchmarking our competitors but have no relationships and have not yet invested in any disruptive organizations.
- We bought start-ups and have some cooperation with start-ups, and we drive incubation with external teams.
- We have successfully launched disruptive businesses and joint ventures. We have an M&A strategy defined for partnering and venturing.
- We use all options to advance in digital: Incubation, venturing, and M&A. We continuously launch disruptive concepts, and we scale up.
- I don't know.

12. Are the customer value proposition and the required partnerships to deliver it defined, and how is value shared among digital ecosystems (DE) members? *

Digital ecosystem Go-To-Market

- Our strategic goals do not reference partnering in a digital ecosystem (DE). We do not participate in any DE, and have limited understanding about the opportunities DEs offer to create value. In that regards, we are rather in a supplier role to companies who participate in DEs.
- We started to define a value proposition and which customers we want to target via DE. We have formed 1:1 partnerships but not yet a digital ecosystem community. We align sporadically on our strategic goals with some of our partners. As we rather pilot some of our partner or DE offerings, we do not exploit the full value potential yet.
- We successfully deliver digital solutions with DE partners and can say we are a key player in this community. Not all of our customer are targeted yet, so we push for broader adoption and we promote and communicate our vision to customers. As we more and more align on strategic goals across the whole DE, value creation mechanisms are being refined.
- A material part of our business, so a double digit % of revenue, comes from delivering digitally enabled and integrated customer value propositions through DE. We orchestrate a wide range of partners including start-ups. All DE members are aligned on strategic goals and how value is shared. The ecosystem grows in a sustainable way.
- I don't know.

13. Is the right DE governance and organization established and are methods in place to share data among DE members? *

Digital ecosystem Operating Model

- There is neither a dedicated organization nor talent and skills to manage DE. We have not yet agreed on rules of engagement (e.g., decision making or IP protection) with partners, therefore, data and processes for running a DE are not yet defined as well.
- We are currently setting up an organization to manage DE and recruit or upskill FTE to operate it. In that regards, we also started to align with potential partners on engagement rules. The process mapping and integration effort pick up as we expect to share data with partners soon.
- Our DE is operating successfully with a small set of partners with whom we make joint decisions, share data (within defined rules) and our DE processes and infrastructure are stable. Our people are learning – together with our partners' people - how to create value from the DE. Still, in many ways we are still experimenting, but we have started to operationalize our strategy to scale up our DE.
- We have a DE operating model that successfully orchestrates multiple partners and ecosystems and has a clearly define governance. Our model is geared towards both DE orchestration and participation, and the rules of engagement are individualized by partner. Our IP and data is well protected and securely shared using dedicated platforms and with clearly articulated processes and data management approaches.
- I don't know.

OPERATIONS

Improve planning, optimize output, and gain real-time end-to-end process insights through the latest technology. Use agile teams to preserve autonomy and constantly drive business value

14. How far is your organization in the journey towards Industry 4.0 standards and to running the factory of the future? *

Industry 4.0 (I4.0) refers to a new phase in the Industrial Revolution that focuses heavily on interconnectivity, automation, machine learning, and real-time data.

- Industry 4.0 standards not yet implemented. Potential of advanced robots, IoT, augmented reality, integration of Product Lifecycle Management (PLM), Enterprise Resource Planning (ERP), and Manufacturing Execution System (MES) is being evaluated.
- The manufacturing process currently undergoes transformational changes, and the roadmap to reach Industry 4.0 standards is in place.
- PLM, ERP, and MES data is currently being integrated; some of the following practices are in place: Advanced robots, augmented reality, and IoT.
- PLM, ERP, and MES data is integrated; factory planning is achieved with simulations, advanced robots are used in production and logistics, and augmented-reality technologies are used.
- I don't know.

15. Do you exploit the benefits of real-time visibility, supply process optimization, and automation to the full extent? *

Digital supply chain

- Many manual activities and fragmentation in most processes, e.g., production scheduling, forecasting, fulfillment. Data is likewise fragmented and often missing or not valid. Customer experience (CEX) is not leveraged as input for feedback loop into processes.
- Some process automation in forecasting, scheduling, network design, segmentation, and sales and operations planning. Inventory is controlled, and supply issues do not disrupt the business. First capturing of CEX, e.g., during shipment tracking. Digital supply chain skills are being developed, and tools are getting used, but still with low integration and simple analytics only.
- Real-time end-to-end visibility of suppliers, manufacturers, logistics, inventors, and customer experiences (e.g., demand-sensing). Highly automated processes (order-to-cash, warehouse, fulfillment) with intelligent robotics solutions in place and partners' activities integrated. Data is shared across those integrated systems. Old processes are consequently getting changed by digital.
- Highly automated and dynamic supply chain with complete end-to-end visibility, involved ML/AI and blockchain for transactional processes, and risk responsiveness. All chain nodes are connected, e.g., suppliers, (contract) manufacturers, distribution centers, third- and fourth-party logistics providers (3PL/4PL), and customers whose data is monitored to decrease issues, and shorten delivery time. AI and advanced analytics are applied across all supply processes.
- I don't know.

16. To what degree does your procurement organization leverage digital technologies and analytics to optimize the function? *

Procurement

- Procurement org. uses available data for basic analytics, and transactions are a mix of paper-based and electronic, with high reliance on manual End-to-End (E2E) order processing. The organization does not invest in advanced technology or analytics skills specific to procurement.
- Procurement org. has started to integrate data from multiple sources to make informed purchasing decisions. Processes are partially digital with some degree of automation in order processing (e.g., purchase to pay tools). We started to build capabilities and invest in technologies for procurement.
- Multiple sources are successfully integrated to visualize and interpret data, make informed purchasing decisions, and manage suppliers (e.g., supplier risk management tools). Processes are mostly digital with room for further E2E automated processing. The organization is implementing new technologies and further develops skills of the employees to apply advanced analytics for procurement.
- Procurement org. leverages a single source of data to run advanced analytics, transactions are mainly digitized, and E2E processes are highly automated. The organization has a clear IT strategy that involves procurement, heavily invests in related technology (with many new digital tools already rolled out), and has already developed analytics skills of the employees.
- I don't know.

17. Are digital tools used to optimize core service processes, e.g., network operations in a telco or utility, risk assessment in insurance? *

Service Operations

- Core service processes are run in the traditional way (partly manual), largely supported by legacy systems.
- First use cases to optimize single process steps are implemented, e.g., analytics for churn prevention and prediction tools to prevent faults. Legacy systems are getting replaced.
- Use cases along processes on a stand-alone basis are implemented, but no E2E optimization across processes yet. Substantial successes in replacement of legacy systems being identified. AI gets leveraged to replace humans in execution.
- Core service processes are optimized E2E and interlinked via automated workflows. Digital tools are leveraged like analytics robotics (and AI) to increase efficiency and effectiveness. Legacy systems have been replaced.
- I don't know.

18. Are digital technologies and opportunities holistically deployed across the corporate-center functions or part of a roadmap to digitize center functions? *

Corporate center

- Low degree of digitization in corporate-center functions; opportunities are passively observed by functional leaders but not pursued.
- Relevance of digitization in center functions is seen for strategic processes, such as decision-making, and pilot projects are launched to explore the opportunities and as Proof of Concept (POC).
- Selected corporate center functions are driving the digital agenda based on proven use cases, especially AI and advanced analytics are pursued in expertise-driven processes and for decision support. However, overarching strategy, innovation approach, and roadmap across functions are still missing.
- Digitization for center functions is on top of the agenda of all functional leaders and a part of a holistic digital transformation agenda. Digitization benefits are realized, such as fewer human errors, less downtime, and better decision-making. AI/ML are key enablers for center functions and make work much more convenient and flexible.
- I don't know.

19. Are processes, especially in the shared services center (SSC), digitized and automated using robotic process automation (RPA) in order to enable the SSC to become a full- service provider? *

Shared services and Centers of Excellence. A shared services center in an organization – is the entity responsible for the execution and the handling of specific operational tasks, such as accounting, human resources, IT, legal, compliance, purchasing, security.

- Low degree of digitization in front- and back-office processes. Many administrative tasks remain heavily manual. In shared services, only basic technologies like Business Process Management (BPM) are used.
- The relevance of Robotic process automation/Artificial Intelligence (RPA/AI) is well understood, and pilots are launched to explore opportunities. First processes are streamlined to support RPA. Basic RPA expertise is anchored and developed in the Shared Services Center (SSC) organization.
- Advanced technologies like RPA and AI/ML are used to automate several E2E processes. A systematic rollout is planned to digitize SSC operations and adjust the operating model. Non-automated processes undergo streamlining, and internal and external platforms for automation are used.
- SSCs have achieved a very high degree of automation in desktop and back-office core processes using RPA and AI/ML. The SSC operating model is adaptive, multi-disciplinary, agile, and with new capabilities. SSC is a full-solution service provider, located onshore and near/offshore.
- I don't know.

DYNAMIC PLATFORM ORGANIZATIONS

Build dynamic, multidisciplinary, modular teams, empower them with autonomy and enable them to work in agile ways.

20. Where is digital anchored in your organization, and do the current governance structures foster digital, e.g., prioritize digital initiatives? *

Organization & governance

- No deliberate organization of digital, little or no digital coordination, at best some single experts working in silos. Digital is not driven by current governance, and activities are not synchronized. Digital is purely opportunistic, and there are no measures (KPIs) for digital.
- Digital is still executed decentrally, but there is a central governance, just with small budgets and no decision rights to push digital across BUs and functions. There is some global alignment on central transformative topics. Very basic KPIs (rather IT-related) are defined for measurement.
- Central or hybrid organization of digital with centers of excellence in BUs and functions, sometimes executing in silos, but sharing cross-sectoral topics. Digital is fostered by central governance (funding, staffing, etc.), and KPIs are in place to measure progress in digital. Often a CDO is assigned, either centrally or in selective BUs/functions.
- Digital is ingrained in the day-to-day paradigm across the whole organization. There is a strong inter-BU and -functional collaboration as well as top-down incentives (KPIs, governance) to make digital a prio-1 topic. Processes like staffing and funding are fully adapted to support the fast-paced environment. The organization operates like a tech company.
- I don't know.

21. Do you apply agile delivery principles across a wide range of the organization, in both business and IT? *

Agile@Scale

- We experiment with agile ways of working; we have a few agile pilots ongoing as well as a few successful agile teams up and running. New roles are getting defined, e.g., scrum master, and agile coach.
- Our agile operating model has been defined and is continuously evolving. We have a portfolio of stable agile teams and have successfully established the required interfaces with the rest of the organization.
- Agile culture and agile product delivery are rolled out across businesses and IT, delivering measurable business value for a complete business line or market. Organizational, governance, and technology agility enablers are addressed to foster agile.
- E2E agile product delivery is deployed across (most of) the enterprise. Agile ways of working extend beyond (digital) product delivery into other parts of the enterprise. Teams work autonomously with a clear customer focus.
- I don't know.

22. To what extent are you driving the build-up of capabilities to bring your transformation at scale? *

Digital transformation accelerator

- Scattered initiatives, no consistent approach, neither methodologies, nor talent management to manage and drive build-up of digital expertise; no dedicated accelerator center operating to own and drive digital.
- Talents are recruited in a dedicated unit with the mandate to drive digital across the organization; limited spread of digital resources; some coordination but limited momentum. Units start working in agile ways.
- In a dedicated unit (accelerator center) talent pools are structured, and processes, governance, and toolbox are in place (including Agile@Scale in IT). Value creation potential is confirmed.
- Digital talent pool is recognized and successfully delivering digital projects, effectively articulated across the organization through control towers, with a focus on value generation. The accelerator center is the showcase of the future digital operating model.
- I don't know.

DIGITAL TALENT

Identify new talent and skills along with fundamentally different leadership models, sourcing talent both internally (e.g. through upskilling the workforce) and externally, e.g. through integrated ecosystems

23. In your organization, is digital institutionalized through leaders and cascaded throughout the organization fostering a cultural change? *

Leadership & culture

- There are no dedicated leaders to manage or drive digital initiatives, also the awareness is missing, and digital is not aligned with business objectives. Initiatives are executed in silos and in traditional ways (with no defect culture).
- We onboard digital talents into new roles and introduce them to the steering boards. The organization has started to adapt towards digital and works collaboratively under good executive guidance. Digital gains awareness and is already partly aligned with the overall business strategy.
- Digital leaders/champions are appointed and incentivized to make quick decisions, take risks, and experiment. The mindset of the organization is strongly adapting towards digital, e.g., applying new methodologies (campus approaches, agile, fail-fast culture, etc.). Also, non-digital leaders drive digital change and transform the organization towards digital. Digital and business strategy are strongly aligned.
- Digital leaders are fully empowered and have a strong seat in decision boards. Digital is cascaded top-down in all functions and BUs. Digital is the new normal, and the whole organization (incl. non-digital leaders) is adapting and optimizing with digital driven by digital champions. Fail-fast-and-improve is the new culture, and team performance is incentivized. Digital is the de facto business strategy.
- I don't know.

24. How do you attract and hire digital talents and develop the required digital skills across your organization? *

Skills & people

- We are currently struggling to attract and recruit digital talent. So far, we don't have a re- and upskilling plan or general training mechanisms to develop digital skills. The digital skills needed by our employees are under development and need to be improved.
- We are addressing recruiting of digital talents with first initiatives, but we do not have a strategic workforce plan. We have developed a basic approach for upskilling and training, focused on selected digital skills. Some of our employees are already equipped with the necessary digital skills, but the majority are not yet there.
- We have a dedicated people strategy to attract, onboard, and retain digital talent, based on a holistic workforce plan. We also run programs to upskill and train our employees. Most employees already have the digital skills they need, and our entire workforce will soon be at this stage.
- We are among the top companies in terms of attracting, recruiting, onboarding, and retaining digital talent. We base our actions on a clear digital strategy and long-term workforce plan. Our trainings and upskilling mechanisms are at the forefront of digital. Our workforce is one of the most digitally skilled in the market.
- I don't know.

DATA & AI

Develop strategic and proprietary data sources to power AI-driven insights and democratize data access to enable teams to build products by separating the data layer from underlying transactional systems

25. Do you fully understand the value that data can create, also from use cases, and have you implemented a structured plan to realize this value? *

Data strategy

- The organization has started experimenting with use cases and proof of concepts (POCs), but data is not part of the top-management agenda. Potential value of data has not been assessed.
- Selected BUs have started assessing the value that can be generated from data. Several successful POCs are in the process of industrialization and receive funding, but no long-term agenda is defined.
- A data strategy clearly is part of the top-management agenda. A data value map (i.e., structured collection of use cases) is developed, and a comprehensive roadmap for implementation is built. A structured POC pipeline is starting to be developed. Funding is available at enterprise level for infrastructure and HR data.
- Data clearly is recognized as a key corporate asset. Several applications and data-driven business models have been industrialized. Data value realization has spread throughout the company, and data value contribution gets measured regularly. Our company highly invests in data projects and respective resources.
- I don't know.

26. Do you have the organizational structures necessary to effectively and efficiently govern data and analytics? *

Data governance

- Data is still managed by IT with limited input from business. No central function or C-level appointed to assure cross-company data management.
- A CDO has been appointed and started implementing a structured data governance approach (incl. on regulation). First global data governance policies and procedures are planned.
- A fully functional data organization exists, under a CDO reporting to top management. The CDO organization includes design authorities for data platforms and data architecture. A governance charter for data is defined, incl. policies and tools. Data quality has significantly improved.
- All key data and analytics governance roles have been implemented and are fully functional in a hub-and-spoke operational model covering the entire organization, where also all data domains are defined. Data and analytics leadership is included in all corporate governance processes.
- I don't know.

27. Do you leverage AI to improve your offerings and business processes as well as to achieve significant business value? *

Artificial Intelligence

- Basic understanding of AI in parts of the organization but neither larger adoption nor use case prioritization. No AI job profiles exist and the common perception is that AI could be covered by existing analytics experts like statisticians.
- Awareness of major use cases enabled by AI on management level, with first pilot project(s) to assess their impact, e.g., NLP or deep learning. Job profiles (e.g., data scientists) are being defined with explicit AI and machine learning skills demand.
- Major AI use cases are defined and prioritized with first value-generating lighthouse implementation and clear responsibilities to drive adoption and experimentation. Current focus is just on parts of the value chain, but here AI becomes key for decision-making and to create new value pools.
- AI is successfully adopted in core offerings and processes, providing competitive advantage. AI is rolled out across the whole value chain and shapes new business models. AI is key to decision-making in the organization.
- I don't know.

28. Do you have an efficient data platform in place to deliver significant business value from data? *

Digital and data platforms

- Traditional data warehouse systems for historical data in place, but often lacking efficient Master Data Management (MDM) functionalities and clear referentials. Analytics are mainly descriptive and run primarily through packaged BI and database tools via batch feeds. Analytical resources are disseminated across the organization.
- Fit-for-purpose systems using a mix of traditional technologies and an efficient but small Hadoop/ Apache big-data platform. Most MDM issues are addressed. Data lakes are in advanced testing. New ways to improve analytics with dashboards, interfaces, or high performance data platforms are investigated.
- Fit-for-purpose enterprise-level platform based primarily on Hadoop/Apache ecosystem or cloud resources for batch-processing solutions. Predictive analytics has become a key input in most operational and strategic decision-making, using modern visualization and also geospatial analyses. MDM issues are being fully addressed at enterprise level. Data lakes exist and offer new analytics possibilities.
- Fully optimized batch and streamlined big-data infrastructure, based on best-in-class technologies originating primarily from the Hadoop/Apache ecosystem or cloud resources. One or more data lakes are fully functional and in production, supporting advanced-analytics tools (real-time capability). This technology has become a key enabler to offers new business models. There is also an enterprise-wide analytics resources strategy.
- I don't know.

29. What are the maturity and breadth of your Cybersecurity (CS) governance, strategy, and architecture? *

Cybersecurity

- CS is handled by the IT organization and is not very visible in the company. There is little business involvement. We have not formally identified our key business assets but have deployed some protection and detection technology (e.g., antivirus software and firewalls).
- A CS program is in place, headed by a CISO (or similar) for our existing business, and includes documented governance, strategy, and architecture. However, we don't have a comprehensive view of business assets and have not broadly implemented CS best practice throughout the organization.
- Our CS program is centered and prioritized around business assets and risks. Security is a priority for senior executive leadership who push "security culture" across the organization. Security is implemented "in-depth," i.e., in technology, processes, and people. All digital initiatives consider CS from the beginning.
- The CS program covers all domains (business IT, industrial IT, and product IT), as well as all parts of the value chain (company, suppliers, distributors, customers, and others). We have built extensive cyber-intelligence capabilities, i.e., to actively look for threats to our assets (e.g., searching the dark web), research new security technology (e.g., security analytics), and deploy offensive techniques to identify vulnerabilities in our systems (e.g., red teams).
- I don't know.

MODULAR TECHNOLOGY

Construct a modern, modular, layered architecture through a next gen tech function using DevOps, API and microservice management, and cybersecurity.

30. How future ready is your IT/Tech operating model, workforce, and partnership with the business functions? *

Next Gen Tech Function

- The tech organization is reflecting geographies to allow market proximity and local synergies. The business and tech functions are entirely separated in silos. The relationship of business and tech is a typical customer-supplier relationship.
- The tech organization structure is reflecting business functions to enable group wide synergies. Tech resources are clearly aligned to business needs and have build product and business expertise.
- The tech function structure is reflecting products or platforms to align tech with product lifecycles. Tech organizes workforce in chapters and tribes that retain a line organization. Tech is heavily involved in strategic and business planning, comes up with own ideas, and challenges business requirements.
- The tech organization structure is reflecting customer groups or channels. Tribes and chapters are self organizing across the entire organization. Tech is a strategic partner of the business and integral part of the strategic and operational business planning and decision making.
- I don't know.

31. Do you apply DevOps and continuous-development principles for IT development and operations? *

Digital delivery (DevOps)

- No clear ownership for digital products, strong silo-thinking with individualized processes for development and deployment, mostly manual testing.
- Business and development teams jointly collaborate, some script automation for testing and pilots for self-services or delivery of infrastructure pro-visioning.
- Same responsibility for development and deployment. Teams are using code repositories, and processes are similar for all stages of the software development life cycle except for deployment. Strong DevOps culture.
- Full-service responsibility and self-organizing communities. Automated testing, standardized processes, and real-time infrastructure provisioning for development, testing, and deployment.
- I don't know.

32. How effectively is your organization leveraging connected things to unlock additional value? *

Internet of things

- Limited recognition of benefits of IoT to business, limited assessment of hurdles to implement IoT technology in a company's products or services.
- Some prioritization of potential use cases where IoT can be implemented and can enable value capture and IoT pilots are planned or in progress. Some gaps in technology that are being addressed in roadmaps.
- IoT is already deployed in key use cases with benefits in operational improvements or enabling new business models. Technology is aligned with currently implemented use cases. Organization has key roles to unlock full value of IoT, incl. analytics, and HW/SW, OT skills.
- Advanced IoT-enabled business model, such as data orchestration, new services, or platform capabilities. IoT is a key consideration for current and future business model design across BUs and value chain. Active participant in the IoT ecosystem with active complementary partnerships.
- I don't know.

STRATEGY & PURPOSE

Articulate and embed a timeless purpose, and then build a strategy powered by digital and people to support it.

33. Which priority does digital have for your organization, and are you aware of how it affects your industry and business? *

Vision

- We are aware that digital might impact the industry but have not yet defined a digital strategy.
- Digital strategies coexist in several functions or BUs, where trends and the impact of digital were analyzed. We understand the disruptive forces.
- The digital target state for our organization is developed, and the vision is articulated organization-wide. We know what is best in class in our industry.
- Digital is number-one-priority topic and integrated part of the CEO agenda; a clear process to update the vision is defined, and a digital strategy across BUs and functions is in place.
- I don't know.

34. What is your aspiration for the business? To what extent are quantifiable scenarios developed and evaluated across your organisation? *

Ambition

- No ambition developed yet, but ideas and options have been elaborated on how our organization can become more digital.
- Scenarios were developed on how our organization can become digital, but no ambition level has been agreed upon yet.
- The ambition level is developed, understood by all parties (business and IT), and approved by the leadership team with specific quantitative and qualitative measures being defined what it means to reach our ambition.
- The digital ambition is articulated, understood, and promoted throughout the entire enterprise, and cascading targets have been set to mobilize the organization towards the target state.
- I don't know.

35. Are you familiar with what digital opportunities and use cases exist for your business? To support prioritization, do you have a formalized process, criteria, and investment strategy in place? *

Priorities and alignment

- We are aware of a few digital opportunities across one-off functions in our organisation. The traditional portfolio process does not specifically cater for digital initiatives. Performance of digital initiatives is not monitored.
- We are starting to ideate and pilot one off digital initiatives within select BU's/functions. In some BUs or functions, individual governance processes are established to prioritize digital in that BU or function.
- We are starting to systematically ideate and pilot one off digital initiatives within select BU's/functions of organisation. A global guideline (process, responsibilities, decision-making) is defined on how to evaluate digital projects regularly based on dedicated measurements.
- We have a thorough understanding of opportunities via digital to 'digitise our core' (operations, support functions, go to market) and build new businesses. We have a formal processA global formal process is in place to ensure prioritization and cross-organizational alignment (IT, BU, regions, functions) of digital initiatives with the corporate strategy. Performance and synergy realization of digital initiatives are measured.
- I don't know.

36. How does your organization manage the digital transformation journey? *

Roadmap

- Digital initiatives are managed in each BU, region, or function individually. There are no overarching plan and no involvement of external stakeholders.
- Some digital initiatives are managed across BUs, functions, and regions.
- A roadmap of digital initiatives is being developed and frequently reviewed to reach our digital ambition holistically across BUs, functions, and regions. All stakeholders are strongly engaged.
- An integrated overall digital transformation journey is defined and globally aligned. We continuously track progress and measure specific indicators, e.g., growth of budget assigned for digital.
- I don't know.

Appendix 2: BCG's Digital Acceleration Index Questionnaire Responses (Data collection 1)

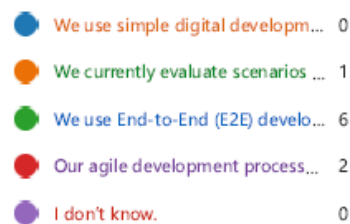
Digital Acceleration Index

9
Responses

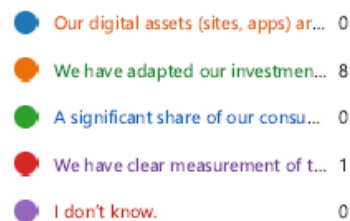
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Average time to complete

Active
Status

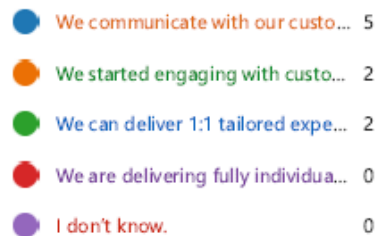
1. To what degree are you using digital tools and digital-supported processes to improve the research & product development function?



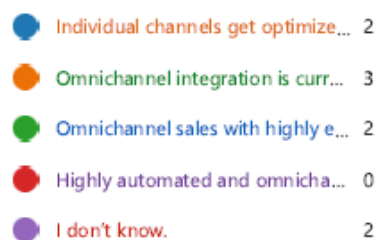
2. How do you target customers via digital channels, and how do you run a digital marketing operating model?



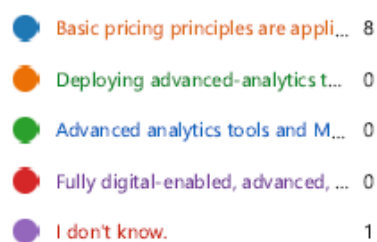
3. Do you leverage data and use advanced analytics to deliver a 1:1 personalized experience to customers in a scalable, cost-efficient way?



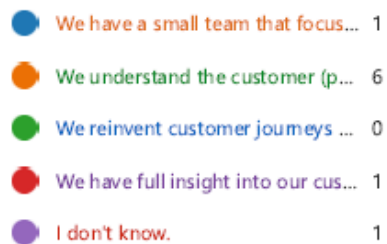
4. How do you optimize and integrate your sales channels and processes (incl. payment and fulfilment) using digital technologies and analytics?



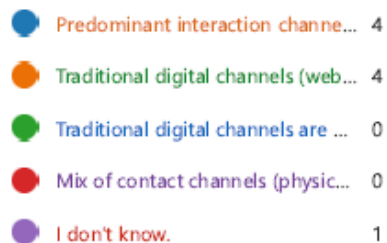
5. Do you improve your pricing by applying digital and data-driven technologies and thus gain competitive advantage?



6. What is your current approach in consistently defining the best-in-class customer experience through digital?



7. Are digital interactions leveraged substantially? Is each customer service channel (call center, web, app, mail, e-mail, chat, etc.) optimized for efficiency and effectiveness using digital technologies?



8. How does your organization foster digital innovation, identify opportunities and white spaces, and develop and commercialize new digital offers?



9. How aggressive are you in trying to revolutionize your own industry?

- We are disrupting our customer ... 3
- We are disrupting our product o... 3
- We are disrupting our business ... 2
- We have successfully launched a... 0
- I don't know. 1



10. How do you mobilize your organization for digital?

- Our people know digital disrupt... 0
- We experiment with prototypin... 4
- Several times we have used ligh... 1
- Lighthouse projects and minimu... 0
- I don't know. 4

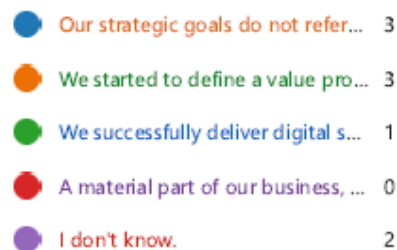


11. How do you capture the value and the business coming from disruptive digital organizations?

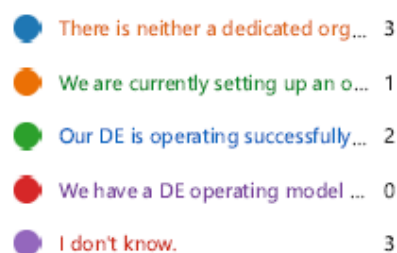
- We are benchmarking our comp... 5
- We bought start-ups and have s... 0
- We have successfully launched ... 4
- We use all options to advance in... 0
- I don't know. 0



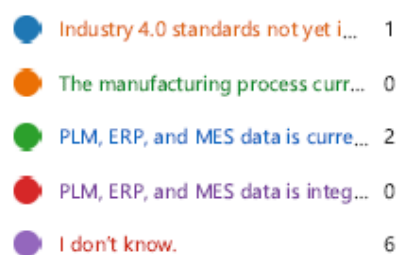
12. Are the customer value proposition and the required partnerships to deliver it defined, and how is value shared among digital ecosystems (DE) members?



13. Is the right DE governance and organization established and are methods in place to share data among DE members?



14. How far is your organization in the journey towards Industry 4.0 standards and to running the factory of the future?



15. Do you exploit the benefits of real-time visibility, supply process optimization, and automation to the full extent?

- Many manual activities and frag... 3
- Some process automation in for... 3
- Real-time end-to-end visibility o... 0
- Highly automated and dynamic ... 0
- I don't know. 3



16. To what degree does your procurement organization leverage digital technologies and analytics to optimize the function?

- Procurement org. uses available... 1
- Procurement org. has started to... 3
- Multiple sources are successfull... 0
- Procurement org. leverages a si... 0
- I don't know. 5

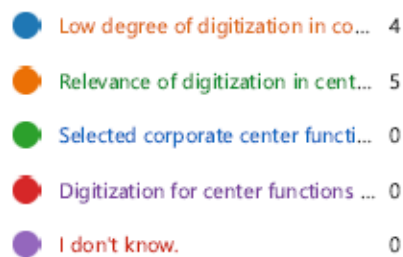


17. Are digital tools used to optimize core service processes, e.g., network operations in a telco or utility, risk assessment in insurance?

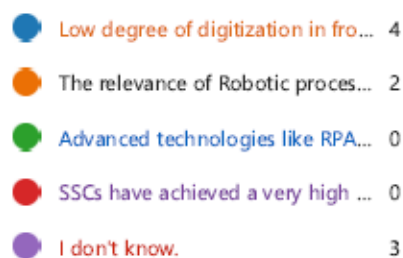
- Core service processes are run i... 1
- First use cases to optimize singl... 4
- Use cases along processes on a ... 1
- Core service processes are opti... 0
- I don't know. 3



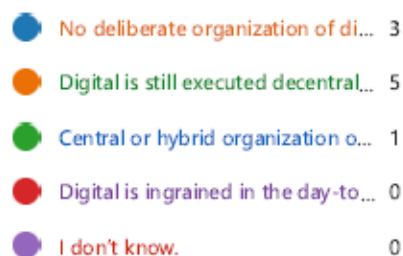
18. Are digital technologies and opportunities holistically deployed across the corporate-center functions or part of a roadmap to digitize center functions?



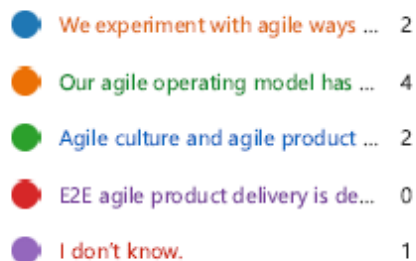
19. Are processes, especially in the shared services center (SSC), digitized and automated using robotic process automation (RPA) in order to enable the SSC to become a full- service provider?



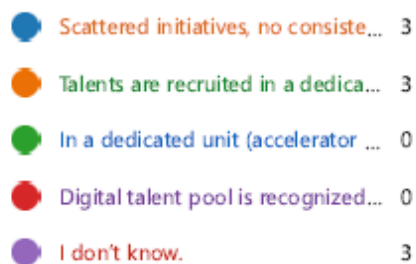
20. Where is digital anchored in your organization, and do the current governance structures foster digital, e.g., prioritize digital initiatives?



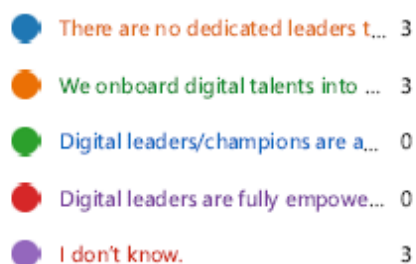
21. Do you apply agile delivery principles across a wide range of the organization, in both business and IT?



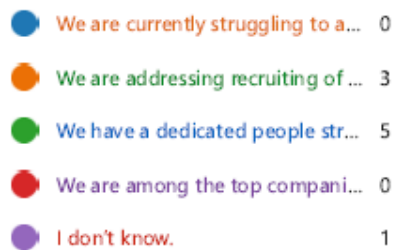
22. To what extent are you driving the build-up of capabilities to bring your transformation at scale?



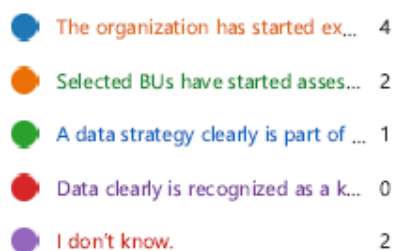
23. In your organization, is digital institutionalized through leaders and cascaded throughout the organization fostering a cultural change?



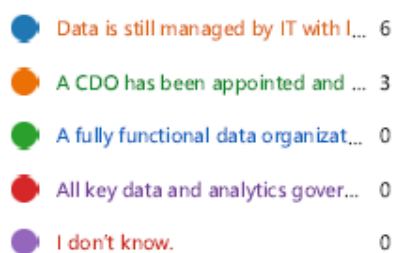
24. How do you attract and hire digital talents and develop the required digital skills across your organization?



25. Do you fully understand the value that data can create, also from use cases, and have you implemented a structured plan to realize this value?



26. Do you have the organizational structures necessary to effectively and efficiently govern data and analytics?



27. Do you leverage AI to improve your offerings and business processes as well as to achieve significant business value?

- Basic understanding of AI in par... 7
- Awareness of major use cases e... 0
- Major AI use cases are defined a... 0
- AI is successfully adopted in cor... 0
- I don't know. 2



28. Do you have an efficient data platform in place to deliver significant business value from data?

- Traditional data warehouse syst... 6
- Fit-for-purpose systems using a ... 1
- Fit-for-purpose enterprise-level ... 0
- Fully optimized batch and strea... 0
- I don't know. 2

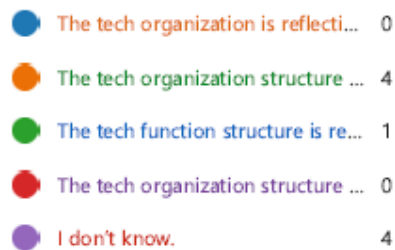


29. What are the maturity and breadth of your Cybersecurity (CS) governance, strategy, and architecture?

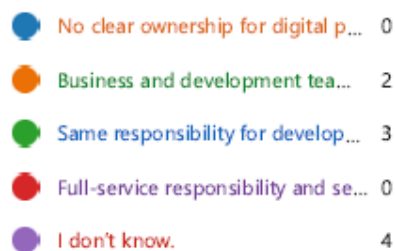
- CS is handled by the IT organiza... 0
- A CS program is in place, heade... 1
- Our CS program is centered and... 2
- The CS program covers all dom... 6
- I don't know. 0



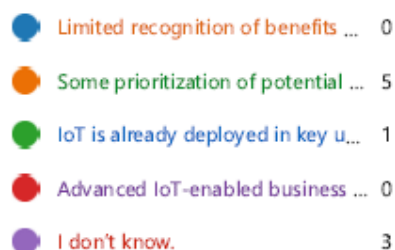
30. How future ready is your IT/Tech operating model, workforce, and partnership with the business functions?



31. Do you apply DevOps and continuous-development principles for IT development and operations?



32. How effectively is your organization leveraging connected things to unlock additional value?



33. Which priority does digital have for your organization, and are you aware of how it affects your industry and business?

- We are aware that digital might ... 2
- Digital strategies coexist in seve... 3
- The digital target state for our o... 2
- Digital is number-one-priority t... 2
- I don't know. 0



34. What is your aspiration for the business? To what extent are quantifiable scenarios developed and evaluated across your organisation?

- No ambition developed yet, but... 1
- Scenarios were developed on h... 4
- The ambition level is developed,... 4
- The digital ambition is articulate... 0
- I don't know. 0



35. Are you familiar with what digital opportunities and use cases exist for your business? To support prioritization, do you have a formalized process, criteria, and investment strategy in place?

- We are aware of a few digital op... 2
- We are starting to ideate and pil... 2
- We are starting to systematically... 3
- We have a thorough understand... 0
- I don't know. 2



36. How does your organization manage the digital transformation journey?

- Digital initiatives are managed i... 1
- Some digital initiatives are man... 6
- A roadmap of digital initiatives i... 1
- An integrated overall digital tra... 0
- I don't know. 1



Appendix 3: Digital Transformation Acceleration Questionnaire and Responses (BUs, Data collection 1). Based on Heidrick & Struggles (2022).

Digital Transformation Acceleration Questionnaire (BUs)

14
Responses

08:16
Average time to complete






Active
Status

1. Business Unit

 Digital Innovations	2
 Intelligent Devices	3
 Machines & Vehicles	3
 Space & Defence	2
 None	4



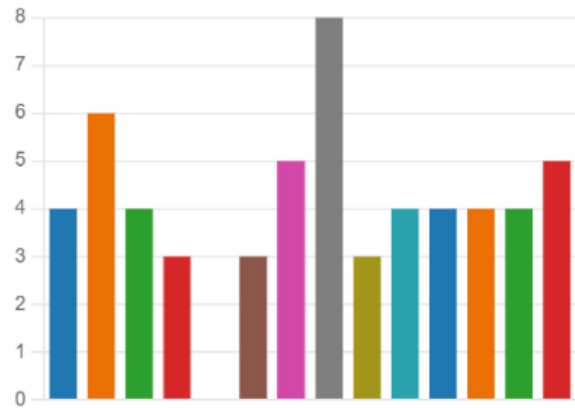
2. Center of Excellence

 Embedded Solutions	5
 Security and Information Manag...	0
 Software	1
 Product Design	3
 None	5



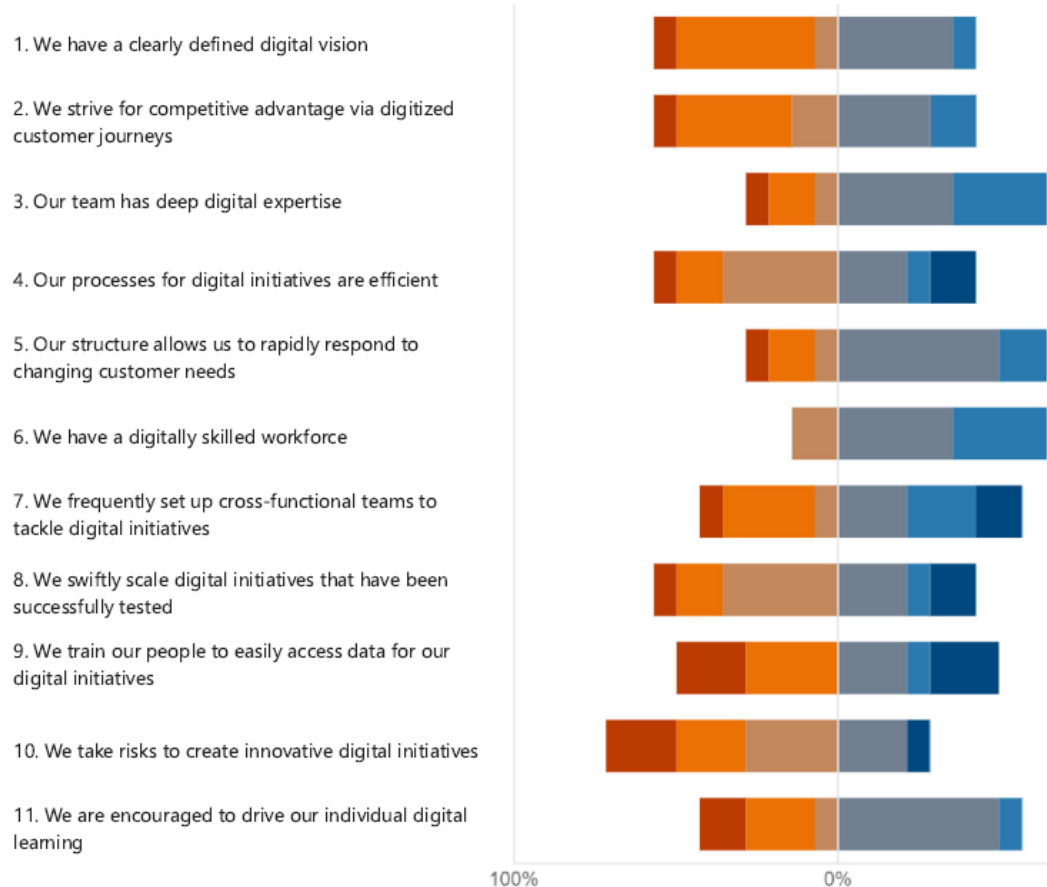
3. Industry

● Defence	4
● Electrical equipment	6
● Elevators and Lifting equipment	4
● Energy	3
● Financial	0
● Healthcare and Life Sciences	3
● Logistics and Robotics	5
● Machines and Vehicles	8
● Marine	3
● Medical Devices	4
● Railway	4
● Space	4
● Test and Measurement	4
● Other	5



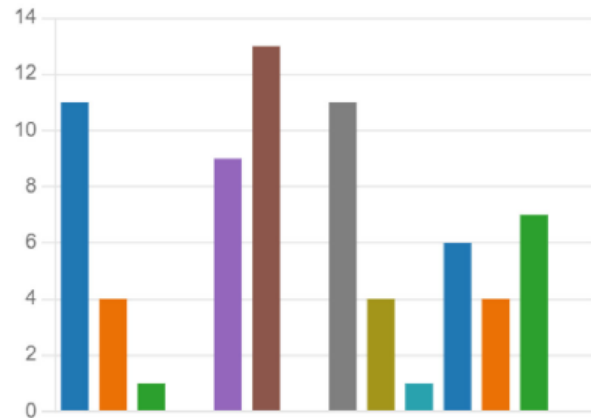
4. Please indicate how much you agree or disagree with the statement below about Huld.

■ Strongly Disagree
 ■ Disagree
 ■ Neither Agree Nor Disagree
 ■ Agree
 ■ Strongly agree
 ■ Don't Know



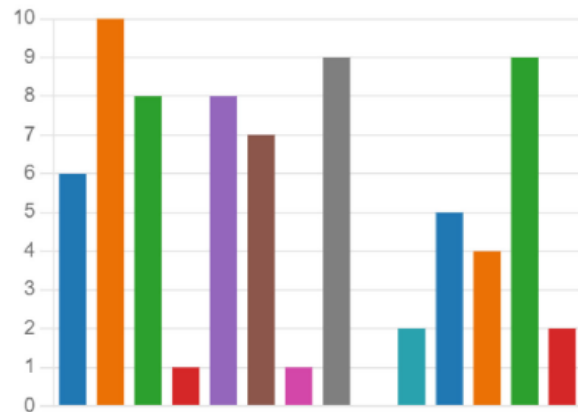
5. Please choose which of the technologies below our organization has the most expertise today (multiple options can be selected).

● 3D Printing	11
● AI (Machine Learning, Deep Lea...	4
● Big Data/Analytics	1
● Blockchain	0
● Cloud programming	9
● Cybersecurity	13
● Immersive Experiences (Virtual R...	0
● Internet of Things	11
● Wearables	4
● Quantum Computing	1
● Robotics/Drones	6
● Satellite mega-constellations	4
● Wireless Technologies (5G, LiFi, ...	7
● Other	0



6. Finally, please choose which of the technologies below our organization will need the most expertise in the next 2-3 years (multiple options can be selected).

● 3D Printing	6
● AI (Machine Learning, Deep Lea...	10
● Big Data/Analytics	8
● Blockchain	1
● Cloud programming	8
● Cybersecurity	7
● Immersive Experiences (Virtual R...	1
● Internet of Things	9
● Wearables	0
● Quantum Computing	2
● Robotics/Drones	5
● Satellite mega-constellations	4
● Wireless Technologies (5G, LiFi, ...	9
● Other	2



Appendix 4: Digital Transformation Acceleration Questionnaire and Responses (COEs, Data collection 1). Based on Heidrick & Struggles (2022).

Digital Transformation Acceleration Questionnaire (CoEs)

10
Responses

272:58
Average time to complete






Active
Status

1. Business Unit

 Digital Innovations	0
 Intelligent Devices	2
 Machines & Vehicles	1
 Space & Defence	1
 None	6



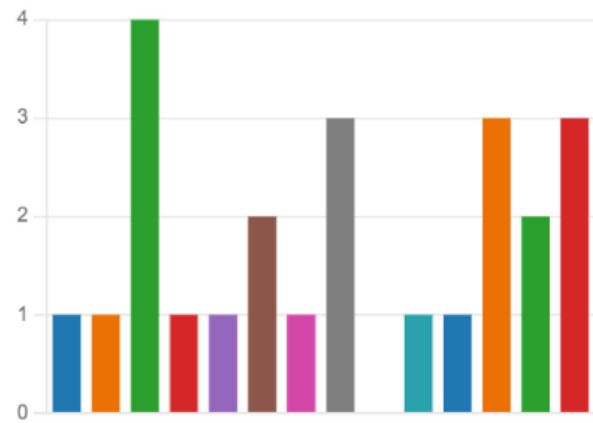
2. Center of Excellence

 Embedded Solutions	5
 Security and Information Manag...	1
 Software	1
 Product Design	2
 None	1



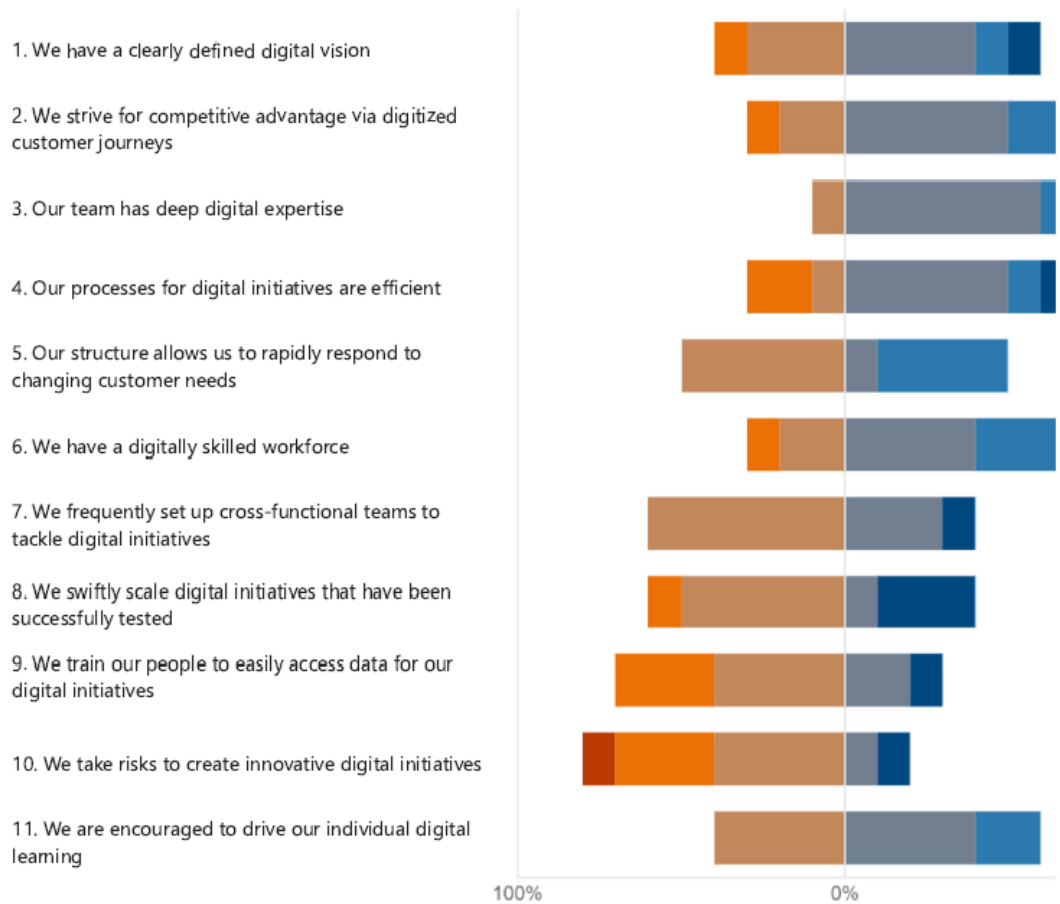
3. Industry

● Defence	1
● Electrical equipment	1
● Elevators and Lifting equipment	4
● Energy	1
● Financial	1
● Healthcare and Life Sciences	2
● Logistics and Robotics	1
● Machines and Vehicles	3
● Marine	0
● Medical Devices	1
● Railway	1
● Space	3
● Test and Measurement	2
● Other	3



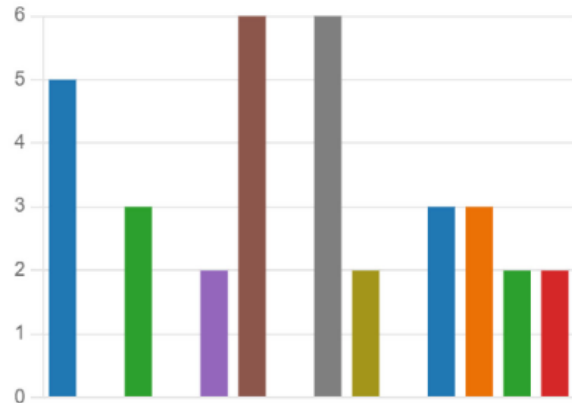
4. Please indicate how much you agree or disagree with the statement below about Huld.

■ Strongly Disagree
 ■ Disagree
 ■ Neither Agree Nor Disagree
 ■ Agree
 ■ Strongly agree
■ Don't Know



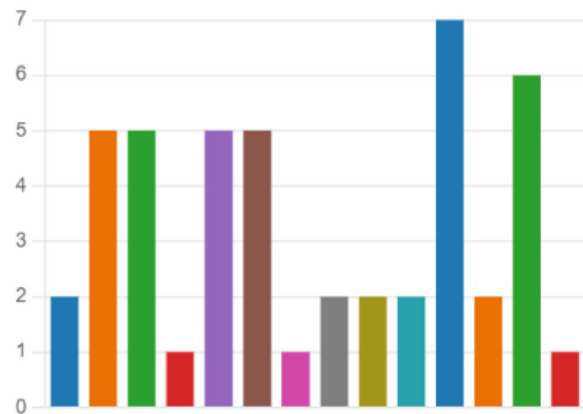
5. Please choose which of the technologies below our organization has the most expertise today (multiple options can be selected).

● 3D Printing	5
● AI (Machine Learning, Deep Lea...	0
● Big Data/Analytics	3
● Blockchain	0
● Cloud programming	2
● Cybersecurity	6
● Immersive Experiences (Virtual R...	0
● Internet of Things	6
● Wearables	2
● Quantum Computing	0
● Robotics/Drones	3
● Satellite mega-constellations	3
● Wireless Technologies (5G, LiFi, ...	2
● Other	2



6. Finally, please choose which of the technologies below our organization will need the most expertise in the next 2-3 years (multiple options can be selected).

- 3D Printing 2
- AI (Machine Learning, Deep Lea... 5
- Big Data/Analytics 5
- Blockchain 1
- Cloud programming 5
- Cybersecurity 5
- Immersive Experiences (Virtual R... 1
- Internet of Things 2
- Wearables 2
- Quantum Computing 2
- Robotics/Drones 7
- Satellite mega-constellations 2
- Wireless Technologies (5G, LiFi, ... 6
- Other 1



Appendix 5: Workshop for Building the Proposal (Data collection 2)

Brainstorm workshop

Use this template for a creative collaborative session to generate new ideas and explore different topic areas. Start with a fun and interactive ice-breaker, generate as many ideas you can and cluster all the ideas into a theme.

Steps:

1. As the facilitator, set the tone and purpose of the workshop.
2. Each person writes down their ideas in response to proposed themes
3. Gather all key ideas and populate them into themes.

KEY AREAS	IDEAS						
Dynamic organization: Agile culture & way of working	Barriers on the path to digital acceleration						
	delay and cost of accepting new way of working	overestimation of company's level of agile culture.	delay and cost of NOT accepting new way of working :)	Business case or financial benefits of adoption is not understood	Upper management is not actively acting as sponsors for the change	Less communication between CoEx and BU on the future needs for needed competences by customer. Sometimes it takes months to find suitable expert for a business case.	
	How can we overcome the barriers to accelerate the digital transformation?						
	Ensure that the benefits of the transformation are well understood	align the thinking about company's agile culture among BUs and CoEx through an agile culture professional program for leaders that enables them to experience what an actual agile culture looks like	Elevate the digital transformation as one of the company's strategic projects	Share information of the realized success stories		More communication between CoE and BU	
Optimized Operations	Barriers on the path to digital acceleration						
	various tools that may contain same info and don't work well together	Some tools are used in allocating resources and communication between sales and Huld leaders but still with low integration.	Potential of the new digitalized tools are not fully understood	There are other simultaneous development projects ongoing stealing bandwidth from the projects enhancing digital transformation	Targets are agreed, but no clear target setting or follow-up of the realized actions	Benefits are not understood well enough, slows down the progress	Identify clear problem areas we are interested to fix with the help of digital tools
	How can we overcome the barriers to accelerate the digital transformation?						
	streamline tools by: (1) using tools from the same provider (not always possible), (2) own tools using APIs from existing tools, (3) create own tools	Having a systematic process and tool to streamline communication and operations so that we can collaborate more effectively to faster decision-making.	Have clear "example" pilot cases proving the benefits	Set clear priorities to developments projects			
Digital Talent	Barriers on the path to digital acceleration						
	lack of talent on the market	Not having a long-term recruiting plan.	Basic approach for training not focused on the digital skills, but letting employees to think and choose traditional topics for training without guidance on the needed future skills.	Lack of time, "easier" to continue working with legacy ways			
	How can we overcome the barriers to accelerate the digital transformation?						
	innovative ways to attract talent	developing a holistic workforce plan and recruiting & retaining digital talent based on that plan	Run programs to upskill and train employees to get through the most digitally skilled competitors in the market.	Acquire clear and real life success stories making it easier to "buy" the idea of new ways of working			