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The effect of enterprise architecture artifacts on digital transformation: A dynamic capability perspective

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Abstract

Companies face one of the biggest challenges since the 1st industrial revolution. The effects of digital transformations are changing markets, consumer behavior and enforcing new disruptive digital technologies in a fast pace. To cope with these disruptive changes, Enterprise Architecture (EA) is used as a strategy to build dynamic capabilities, using EA artifacts for the strategic planning process. However, little is known about the value of EA driven dynamic capabilities for digital transformations. To address this gap this research explores in detail how organizations can leverage EA-driven dynamic capabilities for digital transformations. Based on an in-depth single case study, I studied the impact of EA artifacts for the strategic planning process of digital transformations. The results show that the use of EA artifacts in the strategic planning process, result in digital transformation benefits, such as customer engagement, business and IT alignment, agility and innovative capabilities. These findings contribute to the EA and dynamic capabilities literature by clarifying various aspects of the relationship between the use of EA driven dynamic capabilities and digital transformation.

Key terms

Digital Transformation, EA Driven Dynamic Capabilities, Enterprise Architecture, Enterprise Architecture Artifacts

Summary

Companies face one of the biggest challenges since the 1st industrial revolution. The effects of digital transformations (DT) are changing markets, consumer behavior and enforcing new disruptive digital technologies in a fast pace. As a result, companies need to have a dynamic response to the rapidly changing environment. To cope with these disruptive changes, Enterprise Architecture (EA) is used as a strategy to build dynamic capabilities, using EA artifacts for the strategic planning process. More specifically, they build EA driven dynamic capabilities for DTs. Although previous research provides a conceptual framework, little is known about the value of EA driven dynamic capabilities for DTs. Therefore this research tries to answer the following research question: "*How do EA artifacts, as part of an EA-driven dynamic capability add value to the strategic planning process for digital transformations?*"

The embedded single case study was conducted at a BU that is part of a large international parcel delivery company. Within this enterprise, each BU is responsible for its own IT/ Digital strategy. Although this has local benefits in terms of responsiveness, it also comes with challenges of aligning IT landscapes throughout the entire enterprise. Other challenges the company faced the past years were Brexit, COVID and now even the Ukraine war and the potential recession. On top of that, new competitors are disrupting the market with the use of new digital technologies, changing the perception of the customer. Hence, this firm operates in a very dynamic market. During this study, multiple stakeholders within the organization were questioned through semi-structured interviews. These stakeholders are decision makers within the strategic planning process for DT or otherwise affiliated to the strategic planning process for DT and/or EA.

EA benefits for DT are achieved through a chain of events that is called the EA value realization path. The first step is to convert EA investments into EA artifacts. The results show that high quality EA artifacts rely on the right people with the right skillset, backed by top-management to invest in EA artifacts. Within the case organization, ten EA artifacts were found that support the strategic planning process within the case organization. The use of EA artifacts for the strategic planning process result in EA driven dynamic capabilities. These unique capabilities utilize EA artifacts to sense, seize and transform. For each unique capability and their purpose, an EA artifact was found. Finally these EA driven dynamic capabilities result in benefits for DT. These benefits are customer engagement, BITA, agility and innovation.

This study aimed to identify the value of EA artifact, as a result of EA driven dynamic capabilities for the strategic planning process of DT. It can be concluded that EA-driven dynamic capabilities lead to DT benefits. Moreover, the results have shown that DT benefits come from a series of events e.g. the value realization process. Within this process the strategic planning process is a continuous process, containing a feedback-loop for continuous improvement. This enables practitioners to optimize the cycle time between sensing and transforming. These faster iteration results in the ability to test and experiment with more DT initiatives, therefore it improves innovation.

Finally, further research in the fields of EA quality, EA maturity and organizational benefits for DT could enhance the understanding on how EA artifacts can add value for DT in practice. From a practical perspective it is recommended that the case organization keeps investing in EA capabilities, so that they can follow the EA value realization path.

Contents

1. Introduction

1.1. Background

Since the invention of the steam engine in the 60's, the first industrial revolution became a fact. Now, more than 50 years later, we have entered the 4th industrial revolution. This industrial revolution is characterized by global technology trends such as big data, the internet of things and the rise of artificial intelligence. These new rapid changing technologies are one of the biggest challenges that companies currently face. The effects of digital transformations (DT) are changing markets, consumer behavior and enforcing new disruptive digital technologies. Vial (2019) describes DT as *"a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies"* (p. 118). The ability of companies to respond to this changing environment are characterized by the dynamic capabilities of a company. Dynamic capabilities are defined as a specific subset of capabilities that allow firms to integrate, build, and reconfigure internal and external resources to create new products and processes and respond to changing business environments (Teece, Pisano, & Shuen, 1997). This research utilizes the dynamic capability view (DCV) on the strategic planning process for DT. This process goes through three consecutive stages: sensing new opportunities, seizing or mobilizing of resources for potential new products, services or processes and finally conceptualizing the actual transformation (Grave, van de Wetering, & Kusters, 2021). Enterprise Architecture (EA) tries to bridge the gap between strategic planning and implementation efforts. EA can be considered as a representation of a high-level view of enterprise business processes and the firms' IT systems, their interrelationships, and the extent to which different parts share these systems and processes within the enterprise (van de Wetering, Kurnia, & Kotusev, 2020). However, the success of EA-driven dynamic capabilities is based on the building blocks of EA (Van de Wetering, 2019). These building blocks are called EA artifacts. EA artifacts are descriptive documents providing a specific view of an organization from the perspective of its business and IT (Kotusev, 2019).

1.2. Exploration of the topic

Within the era of DT, there is a tremendous potential for innovation and performance for companies that extend beyond the boundaries of the firm. However, due to this disruptive nature of the environment the competitive advantage is more fragile than ever. These disruptions trigger strategic responses and highlight the importance of sensing and seizing new opportunities and transforming the organization to make it part of their day-to-day business (Vial, 2019). As these digital transformations are changing markets and the world around us, the need for a competitive advantage increases. Dynamic capabilities are the firm's ability to adapt, integrate and reconfigure parts of their organization as a response to the shifting character of the environment. (Teece et al., 1997). For companies that require to be dynamic, it is crucial for companies to formulate and deploy a clear stand-alone strategy to exploit new digital technologies and build their dynamic capabilities. However, DT requires efforts that are company-wide or even extend the borders of the firm. This makes it highly complex and makes a systematic approach to formulate a DT strategy crucial for success (Hess, Matt, Benlian, & Wiesböck, 2016). So, to build capabilities in parallel with implementing new strategic directions, firms need to accelerate the development of their adaptive capabilities (van de Wetering et al., 2020).

The need for these adaptive capabilities stresses the importance of business and IT alignment (BITA) (van de Wetering et al., 2020). EA tries to bridge the gap between business and IT by viewing transformations from an integrated business and IT perspective (Kotusev, 2019). Within the EA discipline, EA artifacts are used to describe the current, future or transitional state of the enterprise, along with the principles to govern the EA design, therefore EA artifacts aim to document decisions to align business and IT and to achieve strategic goals (Grave et al., 2021). Although claims have been made about the reduction of complexity, the realization of BITA and cost reduction, practitioners and academics are still sceptical for the practical implication of EA

(Foorthuis, Van Steenbergen, Brinkkemper, & Bruls, 2016). Moreover, there are even studies that question whether the current EA models are sufficient to support the ongoing DT (Babar & Yu, 2015).

To cope with these disruptive changes a new model was developed, based on the EA-driven dynamic capabilities of a firm (van de Wetering et al., 2020). Their research aimed to develop a new research model that explains how business transformation and organizational benefits are achieved with EA artifacts and an EA framework. One of the key findings was that dynamic enterprise architecture capabilities are crucial to achieve high BITA and process innovation levels (van de Wetering et al., 2020). Hence, it is essential for innovation driven companies to actively invest in EA-driven dynamic capabilities (van de Wetering, Hendrickx, Brinkkemper, & Kurnia, 2021). Although this theoretical framework offers much potential, the real practical usage of EA artifacts within the EA-driven dynamic capabilities framework has not been touched in detail. Popular frameworks offer a range of EA artifacts, however they fail to clearly describe practical implications for DT (Grave et al., 2021). Grave et al. (2021) conceptualized a framework that provides a set of EA artifacts from the literature that should facilitate the strategic planning process from the DCV. However, it remains unclear how these EA artifacts provide actual value, which makes it difficult to systematically synthesize how EA artifacts or their building blocks are used in best practice or how they add actual value to the strategic planning process of DT (Grave et al., 2021).

1.3. Problem statement

Digital transformations offer companies opportunities to gain a competitive edge towards their competitors. Therefore, it is no longer the question whether a DT strategy should be defined, but how firms should embrace DT as a strategic advantage (Hess et al., 2016). This comes with challenges, since DT are highly complex, and the technological advances are rapidly changing (Vial, 2019). This forces firms to adapt to the shifting character of the environment whilst building up their dynamic capabilities (Teece et al., 1997). The need of these capabilities highlights the importance of BITA, using EA artifacts. EA-driven dynamic capabilities can be used to facilitate the strategic planning process (sensing, seizing and transforming) for DT (Grave et al., 2021). Many scholars and practitioners are still sceptical about the practical applicability of EA and its artifacts. Grave et al. (2021) presented a conceptual model of EA artifacts that facilitate the strategic planning process for DT grounded in the DCV. However, it remains unclear how EA artifacts add value to the sensing, seizing and transformation phases of the strategic planning process of DT.

1.4. Research objective and questions

Due to the unclarity of the extracted value for EA artifacts in sensing, seizing and transforming phases of the strategic planning process, the following research question was created:
"*How do EA artifacts, as part of an EA-driven dynamic capability add value to the strategic planning process for digital transformations?*"

The research aims to answer the above mentioned research question. However before this question can be answered, we need to retain more information from literature to understand other viewpoints and to validate the beforementioned statements from other research:
- How do EA artifacts create value in the strategic planning process of DT?

Not all companies are generalizable, so there needs to be a practical understanding how EA artifacts can add value to a firm. There needs to be an understanding how EA artifacts are used by firms and how these add value in the strategic planning process for DT.
- Which artifacts are used by firms to add value to the strategic planning process for DT?
- How do these artifacts add value to the strategic planning process of DT?

1.5. Motivation/relevance

First, this research aims to make a contribution to the scientific community, because little is known about the impact and value of EA artifacts on the strategic planning process of DT. We aim to contribute by exploring how EA artifacts create value for the sensing, seizing, and transforming phases of DT strategy planning. This research also tries to make a contribution to close the gap of the practical applicability of EA artifacts within the EA domain. For instance, the study will help CEO's, CIO's, CDO's and enterprise architects to gain (more) value out of EA practices for strategic planning of DT by providing insight into the value creation mechanics behind EA artifacts.

1.6. Main lines of approach

Chapter 2 will describe the theoretical framework for this research. Consequently chapter 3 provides the justification of the research methods used to conduct the research. Accordingly chapter 4 provides the results from the research. Finally, chapter 5 contains the conclusions and recommendations.

2. Theoretical framework

The aim of the critical literature review is to provide the context and theoretical framework for the research. To be more concise, prior research that is related to the subject is reviewed, analyzed and structured to form a coherent theoretical model. This chapter aims to develop a theoretical base to answer the research question and related sub-questions.

2.1. Research approach

At the start of the program the tutor shared an initial set of 8 articles to get familiar with the subject around EA artifacts for the strategic planning process in DT. Additionally I used articles from the book that was provided to us during the EA course of the Open University. Consequently, a broad range articles were reviewed through a systematic literature review. First, the initial set of articles were used to draw and generate research ideas for the research proposal. Based on the proposal and purpose, three research areas formed the base of the search strategy. These areas were:

1. Strategic planning process for digital transformations
2. EA-driven dynamic capabilities
3. The value of EA artifacts

Accordingly, I performed a systematic literature review using online searches for each of the research areas in the search engine Google Scholar. The searches were conducted according the building blocks method, since it returns sufficient results for each of the research area allowing me to explore the subject matter. Google Scholar is a powerful academic search engine that contains a large number of scientific literature. Due to the high volumes of scientific literature and relative immature research domain, Google Scholar seemed the most viable search engine since it holds the most publications. Google Scholar is especially useful to find publications that are already known, however is less user friendly in combining multiple search terms with Boolean operators (AND, OR, NOT). To mitigate the risk of conducting the wrong search query, I used 2D Search as an alternative solution to conduct advanced searches with multiple search terms. 2D search eliminates syntax errors and provides corrections, it makes use of a visual approach that makes the search more adaptable and AI powered query suggestion help to refine the search. Based on my input for each of the consecutive research areas, the 2D search software (see Appendix 1 for further clarification) generated the following search terms (separated by a score); ("EA" or "Enterprise Architecture") and "Strategic planning process" and "Digital transformation" - ("EA" or "Enterprise Architecture") and ("Adaptive" or "Responsive" or "Dynamic" or "Dynamic capabilities") - ("EA" or "Enterprise Architecture") and ("Artifacts" and ("Value" or "Benefits"). The results can be found in Table 1. First, I performed the search in Google Scholar to identify relevant studies by scanning the titles, keywords and abstracts. Second, the introduction and conclusion were scanned to match the relevance to this research. Lastly, the full text was evaluated. This resulted in 38 articles as the base for the literature review.

Table 1: Results from literature review

	Search query	Title, keywords and abstracts	Introduction conclusion	Full text
Strategic planning process for digital transformations	475	32	18	14
EA-driven dynamic capabilities	5750	121	16	15
The value of EA artifacts	5960	82	14	9

2.2. Implementation

Data extraction was performed by reading the full articles and recording key words and phrases in MS Forms. A mindmap was created to connect the research areas to each other (see Appendix 2). It became appearent

that some of the individual concepts did not create organizational value by themselves. Instead, value came from a series of events or value paths and therefore these concepts are inextricably linked in the value creation process. Accordingly, an analyses was performed on all value creation paths that came from the found literature. All models were scored, based on the applicability and relevance to this research. Resultingly I identified text segments that could link the use of EA artifacts to the strategic planning process and EA-driven dynamic capabilities. Additionally I was able to link the realization of DT to EA-driven dynamic capabilities and organizational performance, which lead to a value realization path based on the model from Alwadain (2020), that is depicted in Figure 1. Further substantiation of the model can be found in the results section of this chapter. Finally, I used the model from Grave et al. (2021) to build the theoretical framework.
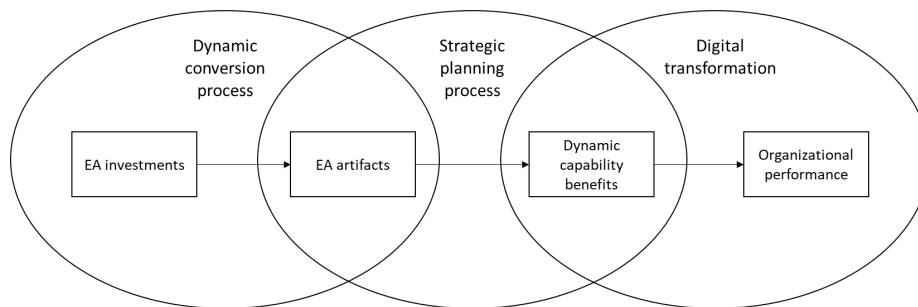

Figure 1: EA value realization path for DT

2.3.   Results and conclusions

The EA value realization process for DT consists of three interrelated processes. The first process is the EA conversion process, where EA investments are converted into EA artifacts that result in adaptability. The second process is the strategic planning process, which refers to the actual usability of the EA artifact in the strategic planning process and result in EA-driven dynamic capabilities. The third and final process is the realization of the actual DT, which requires dynamic capabilities to lead to organizational benefits.

2.3.1.   EA conversion process

The EA conversion process turns EA investments into EA artifacts. EA investments refer to the investments made by the organization to fund time, money and resources for EA initiatives (Alwadain, 2020). EA conversion methodologies result in EA artifacts to describe a current state, future state, analyse gaps and plan the transition towards the future state (Kotusev, Singh, & Storey, 2015). The literature provides an extensive list of EA artifacts with their practical usage and importance in combination with their respective EA framework. However, traditional EA artifacts require extraordinary efforts in time and resources to develop them and keep them up-to-date (Kotusev et al., 2015). Second, EA artifact rarely meet the quality standards that are required for a dynamic response (Cammin, Heilig, & Voß, 2021; Kotusev et al., 2015). As a result, traditional EA practices do not provide the agility that is required for DT (Cammin et al., 2021; Vial, 2019). Hence, Grave et al. (2021) performed an extensive literature review on popular EA artifacts that facilitate the strategic planning process for DT. Table 2 shows the findings of their research. See Appendix 3 for details about meaning and purpose. Although each of these artifacts facilitate the strategic planning process for DT, there are still other success factors to keep in mind to ensure the proper use and quality of EA artifacts. First of all, top management support can fund and prioritize EA initiatives for DT (Alwadain, 2020; Bischoff, Aier, & Winter, 2014; Niemi & Pekkola, 2020). Second, skilled resources contribute to the delivery of quality EA artifacts and stakeholder participation (Alwadain, 2020; Niemi & Pekkola, 2020). Finally, EA artifacts should be linked to their associated organizational activities and purpose (Alwadain, 2020; Kurnia, Kotusev, Taylor, & Dilnutt, 2020). For instance, in the era of rapid change and new digital technologies, the EA artifact require

new characteristics. As a result, Cammin et al. (2021) suggests to restrict the development of EA artifact to only the essential ones and to keep them as simple as possible to keep EA practices agile and adaptive.

Table 2: EA artifacts from the literature review of Grave et al. (2021)

EA Artifact
Technology and skills forecast
SWOT analysis
Strategic plan
High-level operational concept
Capability development plan
Operating model
Impact and risk assessment
Business case
Enterprise portfolio
Conceptual data model
Principles and guidelines
Security and privacy plan
Technology standards list
Stakeholder communication plan
Roadmap

2.3.2. Strategic planning process from the DCV

The strategic planning process explores how the proper use of EA artifacts results into dynamic capabilities (Alwadain, 2020). The strategic planning process is the process of formulating, implementing and evaluating a strategy (Blomqvist, Halén, & Helenius, 2015). Traditionally strategy was considered the starting point of defining the future EA, based on EA artifacts (Kotusev, Kurnia, Taylor, & Dilnutt, 2020). However, strategy often changes and rarely provides a clear direction for IT (Kotusev et al., 2020). So, instead of building an EA based on strategy, EA should be seen as the actual strategy or capability to achieve business goals through the strategic planning process (van de Wetering et al., 2020). However the mainstream EA practices that are accompanied by the traditional resource based capabilities are not adaptive enough for today's complex and turbulent environment (Korhonen, Lapalme, McDavid, & Gill, 2016; Niemi & Pekkola, 2020). Faced with the digital transformation challenge, firms need to establish adaptive EA capabilities or dynamic capabilities that enable a prompt strategic response (Korhonen et al., 2016). Therefore EA calls for a reconceptualization of the conventional methods and practices for the development and management of EA artifacts (Gill, 2015; Korhonen et al., 2016). Accordingly, Grave et al. (2021) used the EA artifacts in table 2 to conceptualize a model that facilitate the strategic planning process for DT, grounded from the DCV. They describe the strategic planning process as the process of sensing, seizing and transforming. Each of the three described process steps are seen as unique capabilities (Teece et al., 1997). Therefore it can be argued that the effectiveness and efficiency of executing the strategic planning process comes from EA-driven dynamic capabilities that drive effective DT. EA-driven dynamic capabilities are the capabilities of a firm to use its EA to achieve the organizations desirable state in a volatile business environment (Van de Wetering, 2019). The strategic planning process for DT starts with sensing capabilities to scan the external environment for unexpected digital trends that could disrupt the organization (Grave et al., 2021; Warner & Wäger, 2019). An EA-based sensing capability highlights the role of EA in the process to sense these digital opportunities (van de Wetering et al., 2021). An EA-based seizing capability uses EA practices to evaluate, prioritize, and select IT and business solutions and mobilize resources for the potential solution (van de Wetering, 2021). Finally an EA transformation capability highlights the use of EA to successfully reconfigure business processes, engage in resource recombination within the firm and adjust the technology landscape in response to unexpected changes (van de Wetering et al., 2021). Table 3 shows an overview of the EA artifacts from Grave, containing the purpose for the three unique capabilities.

Table 3: Purpose EA artifacts for the strategic planning process of DT

EA artifact	Purpose strategic planning process	Capability
Technology and skills forecast SWOT analysis	Facilitates the anticipation of new emerging technologies as a strategic input (Grave et al., 2021)	Sense
Strategic plan	Evaluates the conceptual consistency between business and IT components for DT (Grave et al., 2021)	Seize
High-level operational concept Capability development plan Operating model	Provides an actionable view on the strategic plan as a design for the current and future foundation, which helps prioritize and select new DT initiatives (Grave et al., 2021; Kurnia et al., 2020)	Seize
Impact and risk assessment Business case	Ensuring the efficiency of mobilizing resources, based on risks and rewards (Grave et al., 2021; Kurnia et al., 2020; Warner & Wäger, 2019)	Seize
Enterprise portfolio	Helps business executives and architects to agree on strategic business priorities by synchronizing business and IT impact, in order to successfully reconfigure business processes for DT (Kurnia et al., 2020)	Transform
Conceptual data model Principles and guidelines Security and privacy plan Technology standards list	Reshape the IT landscape with reusable IT assets to prevent duplication and reduce development cycle times (Grave et al., 2021; Kurnia et al., 2020)	Transform
Stakeholder communication plan Roadmap	To re-adjust plans and re-allocate human and organizational resources required for their implementation (Kurnia et al., 2020)	Transform

2.3.3. EA-driven dynamic capabilities benefit DT

Digital transformation is "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (Vial, 2019). Hess et al. (2016) take it even further, by describing DT as an enabler of changing business models, products or even organizational structures. For those reasons, DT can be seen as a process to realize organizational performance. The literature names market growth, increased customer satisfaction, reputation and financial and operational performance as key organizational benefits that come from DT (Van de Wetering & Dijkman, 2021; Vial, 2019)

However DT benefits and organizational performance are not achieved directly. Warner and Wäger (2019) show that in fact strategic agility is a critical dynamic capability. Hence, the execution of the strategic planning process and building EA-driven dynamic capabilities are crucial for strategic change in a volatile environment. According to Van de Wetering and Dijkman (2021) digital platforms create value by providing a resilient digital environment, where previously disparate devices are now connected and drive innovation among business ecosystems, participants and stakeholders. In other words, business strategy and the technical environment of the firm must be in line and equally adaptable to achieve organizational value through DT. This harmonization between business strategy and IT is called BITA, and is a crucial mediating force to achieve organizational benefits (Van de Wetering, 2019). Another mediating force is the EA based capability to sense new technical innovations, which will help firms to align new digital services with stakeholders demands and wishes and therefore enabling new (process) innovations (van de Wetering et al., 2020). In order to stay competitive, the speed and agility of the implementation is crucial to gain market share. Agility can be used to combine digital resources to change business models, handle uncertainty and rapidly adapt to changes in markets and technologies (van de Wetering, 2021; Vial, 2019). However that does not explain how the EA artifacts from

the model of Grave et al. (2021) benefits the strategic planning process of DT. Table 4 provides an overview of EA artifacts that benefit the strategic planning process for DT. In the EA-based sensing process, the SWOT analyses and technology and skills forecast help you anticipate the newest digital trends (Grave et al., 2021; Warner & Wäger, 2019), which provides new insights in innovation possibilities and enables the firm to adequately respond to changes in DT. In the EA-based seizing process EA artifacts are used to evaluate, prioritize and select, and mobilize resources for DT (van de Wetering et al., 2020). First, a strategic plan is used to evaluate conceptual consistency between business and IT components for DT (Grave et al., 2021). Hence it will result in improved BITA. Second, high-level operational concept, capability development plan and an operating model are used to prioritize and select new DT initiatives (Grave et al., 2021; Kurnia et al., 2020). This leads to improved alignment between business strategy and IT initiatives, enabling process innovation and enables fast decision making, therefore improving agility. Third, an impact and risk analyses, and business case are used to mobilize resources, based on risks and rewards (Grave et al., 2021; Warner & Wäger, 2019). This results in better alignment between IT investments and business demands, enabling new process innovation (van de Wetering et al., 2020). In the EA-based transforming process EA artifacts serve the reconfiguration of business processes, reshaping of IT landscapes and re-allocating of EA resources (van de Wetering et al., 2020). An enterprise portfolio helps business and IT specialists to agree on strategic business priorities to successfully reconfigure business processes for DT (Kurnia et al., 2020). Therefore it enables a rapid response to changes. A conceptual data model and governance artifacts help reshape the IT landscape with reusable IT assets to prevent duplication (Grave et al., 2021). This standardization leads to a simplification of the IT landscape structure as well as enhanced agility in terms of planning new IT initiatives (Kurnia et al., 2020). Finally, communication plans and roadmaps can be used to communicate and coordinate strategic change. These artifact improve communication between decision-makers, enables faster knowledge sharing and the exchange of ideas (Kurnia et al., 2020). Therefore they improve BITA, agility and innovativeness.

Table 4: EA artifacts purpose and benefit for the strategic planning process of DT

Capability	EA Artifact	Purpose *(see table 4)*	Benefit
Sense	Technology and skills forecast SWOT analysis	Anticipate	• Innovate • Agility
Seize	Strategic plan	Evaluate	• BITA
	High-level operational concept Capability development plan Operating model	Prioritize & select	• BITA • Innovate • Agility
	Impact and risk assessment Business case	Mobilize resources	• BITA • Innovate
Transform	Enterprise portfolio	Reconfigure business processes	• BITA • Agility
	Conceptual data model Principles and guidelines Security and privacy plan Technology standards list	Reshape IT landscape	• BITA • Agility
	Stakeholder communication plan Roadmap	Re-allocate resources	• BITA • Innovate • Agility

2.4. Objective of the follow-up research

The theoretical framework shows a clear value path in how EA artifacts lead to organizational value with the use of the strategic planning process for DT. However, this is a conceptual framework gathered from literature that has no practical evidence. This framework allows the researcher to explore relevant subjects around the value of EA artifacts for the strategic planning process. The starting point are the EA artifacts that are based on the model described by Grave et al. (2021) for the strategic planning process. The EA artifacts serve the strategic planning process that leads to BITA, innovativeness and agility for digital transformations, which results in organizational performance.
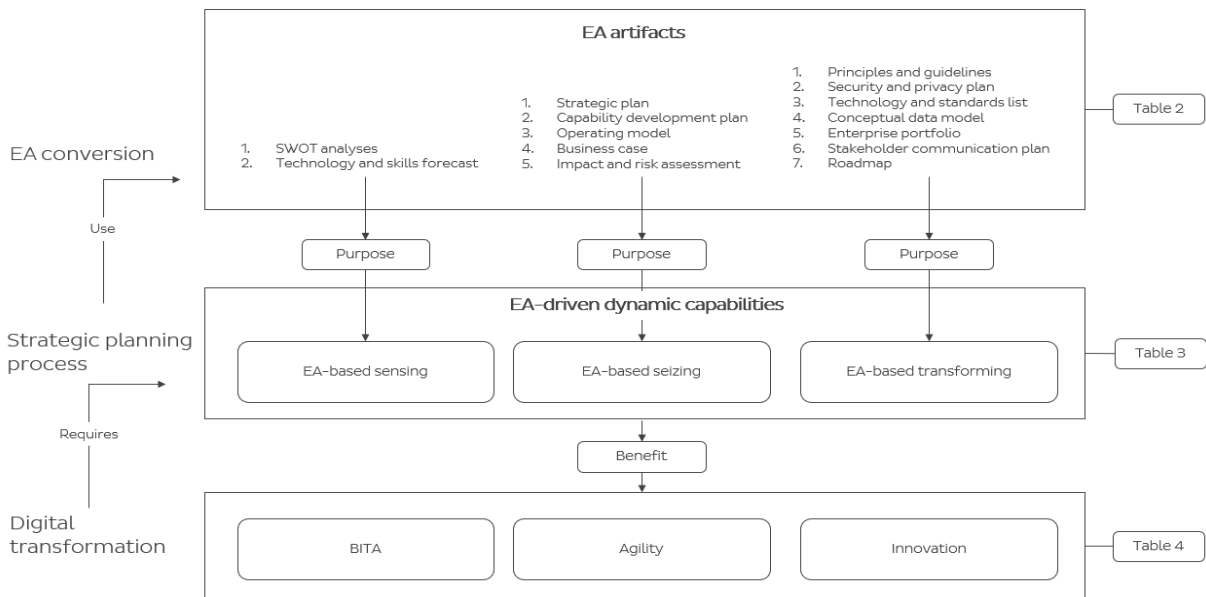

Figure 2: Theoretical framework: EA artifacts for the strategic planning process of DT

3. Methodology

This chapter describes how the research will be conducted. In the following paragraphs the conceptual design an technical design will be elaborated. Additionally, these methods are verified, based on the reliability, validity and ethical aspects. This chapter will provide the justification of choices made for the research approach.

3.1. Conceptual design: select the research method(s)

The research strategy of this research is composed of two key components. First, the literature review provided a theoretical framework to clarify the concepts on how the use of EA artifacts lead to organizational performance through DT. Second, an empirical part of the research will examine the findings of the conceptual theoretical framework, using a variety data sources to ensure that the subject under consideration is explored from several perspectives enabling multiple facets of the phenomenon to be revealed and (Eisenhardt, 1989; Yin, 2003). The aim of these components is to investigate whether EA artifacts add value to the strategic planning process of DT. In other words, these concepts are used to answer the research question. Information can be found from various sources, such as internal documents regarding strategy, EA and its artifacts, and from internal stakeholders. The qualitative nature from sources of information where a contemporary phenomenon is studied, suggest a case study. The three main types of case study research design are exploratory, explanatory, and descriptive (Algozzine & Hancock, 2016, p. 39). The exploratory research examines the causal relation between variables, hence the exploratory qualitative research seems to be the most suitable choice of method, since we want to investigate the relationship between EA artifacts and organizational value in DT. As a result, the embedded single case study that is triangulated with document research has been selected, since the scope of the research comes from a view from parts of the organization.

3.2. Technical design: elaboration of the method

During the analysis phase, a wide range of data will be collected from various sources, including semi-structured interviews, industry studies and internal documents (for example EA artifacts). These methods are required to gain deep insights in the way that EA artifacts add value to the strategic planning process for DT. Therefore, the selection for our case-organization is based on a variety of selection criteria. For one, the organization should have implemented or are implementing DT. Second, the case organization should be willing to spend time on interviews from multiple layers of the organization that are in some form linked to the strategic planning process for DT. Some examples might be a CDO (Chief Digital Officer), Director IT, innovation specialists and (IT) managers. Third, there should be a preparedness of the firm to assist in making relevant documentation accessible for the student. In order to gain insights into the value of EA artifacts within the case organization, at least 7 interviews will held within the organization. Three on a board level, for instance the CDO or CIO. Three on a strategic/tactical level such as the Director IT, Director Development and Manager I&A one on a tactical/operational level, e.g. sr. Innovation manager.

3.3. Data analysis

The starting point of the analyses was gathering internal documents to get insights into the available EA artifacts, their usability and accessibility to get insight in the quality of the artifacts and the management processes around these documents. For semi-structured interviews, face-to-face interviews were the preferred method to collect the data, which enabled personal contact. However, due to the COVID-19 epidemic, this might not be feasible nor wise. Therefore, I invited the stakeholders to virtual meetings by the use of online meeting software, such as MS Teams or Zoom. To introduce the interviewees to the subjects around EA artifact, the strategic planning process and DT, a small introduction was prepared for the interviews (Appendix 4). Additionally I prepared an interview guide with questions regarding the interviewee's expertise (Appendix 5) With permission of the respondents, the interviews were audio-recorded given to control bias

and produce reliable data. Later on, the audio file was used to transcribe the interview. The transcribed document will be encoded in two phases. Phase one will be In Vivo coding (Appendix 6), which is the analyses of texts or processes that are relevant for the research question. Second, I used pattern coding, to develop new themes that contribute to new theoretical constructs and processes. Consequently the findings and themes were organized in Excel and linked to each other to illustrate existing relationships. Finally the concepts and results were reported in chapter 4.

3.4. Reflection w.r.t. validity, reliability and ethical aspects

Reliability and validity are used to evaluate the quality of a research. Reliability concerns the consistency of the measure and validity measures the quality. The reliability of data obtained through semi-structured interviews is influenced by several factors. Reliability is the extent to which data collection methods will result in consistent findings in other studies (Saunders, Lewis, & Thornhill, 2016). In order to adhere to the reliability requirements, all research steps will be documented. For instance, interviews will be prepared, transcribed and analysed and added to the research as appendices. Validity consists of construct, internal and external validity. Construct validity is the extent to which the intended question is measuring what it is intended to measure. This will be ensured by the use of triangulation between different data collection methods and the establishment of chains of evidence. Internal validity is the extend of a trustworthy cause and effect relationship (Saunders et al., 2016). This will be ensured by the use of multiple research techniques, for example the use of pattern matching between the literature and the outcomes of the research. External validity refers to generalizability of the research results. This will be ensured by the use of proven techniques, such as the use of theory in single-case studies. Even though this study intends to withhold to all above mentioned topics, there are also shortcomings to this research. For instance, the generalizability of a single-case study is difficult to prove. The results can differ in different firms, branches or even countries.

In order to protect the interviewees or "human subjects" in an ethical manner, I will ensure mutual consent in the form of a signed document that states that he or she agrees to participate in the research. Accordingly I will ensure anonymity of the research to protect their privacy. Finally, this research will not lead to brand or name damage of any of the parties that participate.

4. Results

The case organization, which we will refer to as Parcel Inc. for anonymity reasons, is a business unit (BU) that is part of an international parcel delivery company (Group). It was originally founded as a German company but was taken over by a French company in 2006. The Group consists of country-based BU's primarily in Europe. Each BU, like our case organization, is autonomous in the way they set-up their operations and IT landscape.

In the following paragraphs I describe the characteristics of the case organization and the way in which EA artifacts are currently used for DT.

4.1. A local Dutch parcel delivery subsidiary

Approximately 847 employees work at this BU and is therefore considered as a small to medium cross-border hub within the Group. The IT department of the BU is led by an IT director, who reports to the CSIO within the BU, with a relatively small but diverse team of IT specialists (application managers, data scientists, etc.). Although multiple roles are present, the role of architect is lacking. The Group HQ has an IT roll-out team, that acts as a pivot point in distributing and harmonizing applications to and from cross-border business units. Despite the influence of Groups Management and Board is present, the BU makes autonomous decisions about the design of its applications and IT structure, provided that it fits within Group IT guidelines and data formats. The coordination between the Group and the BU takes place through periodic consultation at management and board level or through ad hoc (project) discussions. Besides these activities, there are annual forum discussions and a digital working Group has been set up from within marketing.

4.2. EA artifacts within the Parcel Inc.

The dynamic EA conversion process turns EA investments into EA artifacts. Within Parcel Inc. (the case organization), I found ten EA-artifacts. In table 5 an overview is provided, describing the EA artifacts found. Information was gathered from the input of the respondents of the interviews. After the interview, several documents were found within the case organization. For the EA artifacts that are standardized within the processes of the case organization, examples have been added into the appendices. The other EA artifacts, which I found were created on an ad-hoc basis. Although, three out of ten EA artifacts are matched directly to the model of grave, not all artifacts are embedded within the processes of the case organization and were created on an ad-hoc base.

Table 5: Found EA artifacts within the case organization

Artifact	Description	Appendix	Grave
Opportunity and risk list	A list containing the digital opportunities and risks	n.a.	
Strategic plan	A document that contains the overall long term goals of the head quarter in relation to the strategy of the specific BU	Not available	X
Year plan	An annual plan for the department that contains goals and expectations for the coming year.	7	
Project portfolio	An excel document containing a list of initiatives, projects and programs	7	
Business case	A business case provides justification for undertaking a project	n.a.	X
PID	Project initiation document: document containing the high-level business case, risk assessment, estimated costs and required resources across the organization	7	
Inception	A BPM tool to graphically visualize business processes and their physical and information flows	7	
Security & privacy risk assessment	An excel file containing questions related to security and privacy	7	
Landscape map	A visualization of a specific part of the enterprise architecture	n.a.	
Communication plan	It is a document containing policies on when and how to provide information to stakeholders	n.a.	X

4.2.1.   Success factors of EA artifacts

To ensure proper use of EA-artifacts and to ensure their success, success factors need to be defined and propagated. One key driver for success is top-management support. Almost all respondents validated that there is awareness on a board level for the necessity of EA within the case organization that *"EA requires top-management support, which there is – CDO".* Other key factors for success are EA capabilities and capacity. Currently EA capacity is missing *"We often get stuck, because the IT department has fragmented knowledge within the heads of a select group of people, resulting that we end-up with the same people all the time, who only have 40 hours a week – Manager I&A".* Because the information resides in the heads of a select group of people, Parcel Inc. struggled to successfully perform EA conversion *"In order to do this successfully, we need to have it documented. I think there lies the biggest bottleneck – Manager I&A".* As a result Parcel Inc. relies heavily on their partners and suppliers for its architectural decisions. For this reason an EA architect is recruited, because it is a skill that needs to be developed, despite the unclarity on whether he or she can become successful *"An EA architect is a new capability that DPD wants, however due to a lack of vision we don't know what he or she should do or how he or she can become successful – Director IT".* In summary, I observed, that there was top-management support and proper awareness of the board that the EA conversion process is an important process. However in order to be successful, the process needs the right amount of attention by the right capabilities.

4.3. Strategic planning process

This paragraph embeds the EA artifacts found in the strategic planning process from the DCV. Further I will present the purpose and role of the EA-artifact and describes the connections between purpose to the capabilities of the strategic planning process. In table 6 an overview of these connections is provided Please note that for each phase of the strategic planning process there is an EA artifact in place.

Table 6: EA artifacts of the case organization, linked to dynamic capabilities

Artifact	Purpose	Capability
Opportunity and risk list	Combine initiatives from group and business trends as a strategic input for digital transformations	Sense
Strategic plan	Evaluate the consistency of group IT initiatives compared to the local initiatives within the IT strategy of the BU.	Seize
Year plan	Provide an actionable view on the strategic plan for the upcoming year	
Business case	Ensure the efficiency of mobilizing resources, based on risks and rewards	
PID		
Security & privacy risk assessment	Ensure the continuation and compliancy of IT systems and data based on risks	
Landscape map	Reshape IT landscape by gaining in-dept understanding in the IT-landscape and reduce development cycle time	Transform
Inception	Helps to gain deep insights in business processes	
Project portfolio	Helps to re-adjust plans and re-allocate resources for the implementation of projects	
Communication plan		

4.3.1. EA artifacts for dynamic capabilities

To capture digital trends it is vital to scanning the external environment in mechanism called sensing. Sensing starts by scanning the external environment for digital trends. At the BU there was no process in place to structurally sense the external environment *"There are no standardized documents for sensing digital opportunities. That is based on market insights and experience – CSIO"*. Recently an opportunity and risk list was created during a hay-day. The opportunity and risk list is a document that contains information about digital trends, therefore it is a good example of an EA artifact in this step of the strategic planning process, however there is no structural process in place to sense new digital opportunities. According to the sr. innovation specialist it is difficult to sense new digital opportunities, because there is no clear strategic direction *"We fail to sense in a structural way, because we have no direction. You cannot sense everything in this world – Sr. Innovation Specialist"*.

Within the seizing phase of the strategic planning process, EA artifacts are used to evaluate, prioritize and mobilize the initiatives from the sense phase. Five EA artifacts were found in this phase. First, the strategic plan which was used to evaluate the initiatives from the previous phase. Second, the year plan was used to prioritize the initiatives that can be picked up that year. Third, the PID was mainly used to initiate initiatives, mobilize resources across the organization and to identify possible risks. Fourth, the business case was used for larger investments for the same purposes, however was done on an ad-hoc basis. Finally, the security and privacy assessment was used to prevent the risk of security breaches or non-compliancy to GDPR regulations*.* In conclusion, the EA artifacts that were found in this stage, support the seizing capability. However, not all EA artifacts were used structurally.

The transformation capability highlights the use of EA to successfully reconfigure processes, engage in resource recombination adjust the IT landscape. In the transform phase four EA-artifacts were found. First, landscape maps was used as input to change the IT landscape, however these were scattered documents, so there was no complete overview of the entire landscape *"Scattered pieces of the enterprise portfolio exists, but there is no overall overview"*. Second, Inception is a tool to describe and preserve business processes with their respective tools and information flows. Inception goes into high details and was not updated regularly, therefore it was not often used as input for the transformation phase *"Inception is a good tool to secure processes, however the danger lies in becoming a process, pinned to the wall that deviates from reality,*

because of all kinds of reasons -- CSIO". Third, a project portfolio is a document containing all projects and programs for which a PID was approved. It was used for planning purposes, but also to align business and IT initiatives. Finally a communication plan was created to keep the stakeholders up-to-date during projects. To conclude, all EA artifacts fill the gap of the required purpose of the transformation capability. But the EA artifacts that were used to reshape IT were limited and the EA artifact to reconfigure business processes had too much detail.

4.4.   EA-driven dynamic capabilities for DT

Adapting the strategic direction and the technical environment are crucial for DT. The case organization describes many DT's currently in the pipeline. In this section, the value of the strategic planning process to DT's are discussed and finally the value of the EA artifacts for the strategic planning process and DT's are discussed.

4.4.1.   Strategic planning process for DT's

Parcel Inc. operates in a dynamic environment. The landscape is changing rapidly through new disruptors in the parcel delivery market. Customer expectations are changing and the way the case organization is working and communicating with the customer digitizes in a rapid pace. Therefore, all respondents of the case organization emphasized the importance of dynamic capabilities for DT *"So do we need to be dynamic? Yes! Do we need to be very dynamic? I think, extreme – Director IT"*. During the study there were a lot of initiatives in place that were related to DT. Each of these initiatives share the characteristic of leading to long development times, because they were not accurately selected, prioritized or mobilized according to the seize stage of the strategic planning process. Therefore, they cause delays and taking away valuable time and resources to develop new DT's. All respondent felt that if the process was followed structurally, less initiatives would go through the pipeline, resulting in focus and transparency and improved BITA *"If we would have looked more carefully and made it more transparent, the planning would have been a lot more accurate – Manager I&A"*. According to the director development the improved transparency and focus will enable the case organization to transform better and faster, resulting in agility *"I am convinced, that if we do this more and better thought out, we can do things faster – Director Development"*. These faster iterations improve (process) innovation, because it provides more customer feedback. For example, if you go through the chain from sense until transform, you'll receive feedback enabling you to sense new opportunities. This improves time to learn. Time to learn is the time between sense and transform. So, improving the time-to-learn results in more feedback for more innovation opportunities, resulting in a higher success rate for innovations.

4.4.2.   EA artifacts for DT's

The strategic planning process results in improved BITA, agility and innovative capabilities. Table 7 shows the results of the DT benefits of EA artifacts for the case organization in comparison with the model of (Grave et al., 2021). This section contains the value drivers for EA driven dynamic capabilities and validates if they are in line with the proposed EA artifacts from (Grave et al., 2021), finally the EA artifact found in practice are compared to the value drivers. A detailed analysis can be found in Appendix 8

According to many of the respondents, the EA artifacts in this stage should have represented the customer's interests *"Everything start with the question, what does the customer wants? – CDO"*. Therefore, it goes beyond BITA and straight towards the needs of the customer. Therefore, it can be argued that these EA driven capabilities result in improved customer engaged DT's. Moreover, the EA artifacts should have provided enough information to narrow the scope of the search. The reduced scope would yield in improved quality and time to search, which benefits agility. The insights from the feedback loops, should provide the information that enables new digital innovations. The sr. innovation specialist claimed that the proposed EA artifacts (SWOT-Analyses and Technology & Skills forecast) will lead to customer engagement, agility and

innovation, if the EA artifacts were used according to the described requirements. However, the found opportunity and risk list did not provide the benefits that were required for this, since it was not used structurally and it did not use feedback loops from a customer perspective. To summarize, the EA artifacts in this stage require customer input and a feedback loop. This results in improved customer engagement, agility and innovation. However the opportunity and risk list did not provide these benefits.

To evaluate the digital initiatives from the previous stage, it is important to keep in mind that the strategical direction is in line with the strategic direction of the entire enterprise. Therefore, it goes beyond the needs of the BU alone. During the seize phase, the strategic plan was used to evaluate the consistency between group and BU IT-initiatives and -objectives. This plan aims to align IT strategy across the group. This resulted in business and IT alignment across the group. To conclude, the EA artifacts result in BITA.

DTs leads to changing business models. This change requires working towards an organizational plan. DT initiatives should be prioritized accordingly to work towards that goal, which requires discipline and patience, because DT's do not go without hurdles *"With DT's there will be friction and if it will not go as planned, people will escalate and then the one that shouts the loudest will get their way. That is the illness of DPD, it is always about the volumes, it is always about the short term – CDO"*. Based on this short-term focus the conclusion can be drawn, that the prioritization of DTs is a crucial element for aligning future IT and business interests. As a result the EA artifacts used can play a crucial role in achieving BITA. The manager I&A, added that the EA artifacts in this stage will give insights into the feasibility of a DT. Therefore it will speed-up the decision making process in this stage, which will improve agility. The described organizational plan is in line with the characteristics of the proposed EA artifacts, since they facilitate an overview of the direction of the organization or a part of that. Resultingly the EA artifacts in this stage could contribute to improved BITA and agility. The found year plan did align business and IT, because it provided an actionable view of the strategic plan, however it was perceived as a rigid document. To summarize, the EA artifacts in this stage require a vision of the future organization in order to prioritise DTs, while also giving insight into the feasibility. This results in BITA and agility. Consequently, the proposed EA artifacts will result in these benefits, however the found year plan did only result in BITA.

According to the CSIO, the business should have a good image of the requirements that they need and the EA artifacts should represent those requirements, in terms of the benefits, costs, risks and effort. Based on that intel, sr. management can mobilize resources for the DT initiatives. Doing so will result in improved BITA. Additionally, the size of the project or DT initiative should determine the level of detail for these EA artifact *"You don't want to set-up the whole circus, because then you will lose a lot of speed – CSIO"*. Logically, one will become faster, if there is no need for an audit trail, while at the same time having all the relevant data to speed-up decision-making. Hence, the proposed EA artifacts result in BITA and agility, if the described requirements are met. In practice, the PID, business case and security & privacy assessment enabled BITA, because it enabled cross department alignment to achieve IT and business goals and reduced the risk of vulnerabilities. The PID resulted in fast decision making, since it was easy to create and it contained all relevant data to make a decision. The business case was used for larger projects. But, they were created ad-hoc and not according to a template. Therefore much time was lost figuring out which information was required. The security and privacy assessment was also made ad-hoc and it contained many questions, which made it difficult and time consuming to fill in. To conclude, the EA artifacts in this stage require the right amount of information to make decisions and granularity to speed-up decision making. This will result in improved BITA and agility for the proposed EA artifacts. However, not all found EA artifacts resulted in improved agility.

DTs can change entire business models. Therefore it is important that the business processes are flexible to change. According to many of the respondents, a map of the IT landscape in connection to the business processes was missing. And that connection to the business processes was exactly what was required to align

business with IT. Additionally, DT requires fast movements and constant change. However, the Director IT claims that it is difficult to change something that is not there (or at least not documented). To become agile, it is required to have enough insights in the processes related to the IT landscape, without making it too detailed. Many of the respondents agreed that an enterprise portfolio could close the gap *"Because if you have an enterprise portfolio, you can be more decisive, because you know how IT supports the business – Director IT"*. The best fitting tool to re-configure processes within the BU would be Inception. Inception was also highly detailed and unreliable and therefore not contributing to agility or process innovative capabilities *"Inception is a tool where we can document processes, however it does not provide the flexibility to easily bend or re-configure business processes in an agile manner – CSIO"*.

The market is becoming more dynamic each year according to the CEO. In order to stay competitive, it is important to have a simple, efficient, reliable and agile IT landscape *"Agility requires the elimination or contamination of redundant complexity. For instance, it requires decoupled application that can be stacked, re-stacked and unstacked like Lego blocks – CEO"*. EA artifacts that facilitate the standardization of application within the IT landscape can therefore benefit agility. To reshape the IT landscape, the IT landscape maps were used within the case organization. However, they were very detailed and created ad-hoc. Therefore they did not contribute to rapid decision making, because they needed to be checked on accuracy when they were re-used. Additionally, they did not have the element of standardization in it. In conclusion, the EA artifacts in this stage should facilitate the standardization of the IT landscape and enable rapid decision-making. This will result in improved agility for the proposed EA artifacts. However, the found EA artifacts did not result in improved agility.

To be in control of all initiatives it is important that they are all in scope. Hence, it is important to have a total overview of alle initiatives. If there is a good overview, it will become easier to re-allocate resources. Hence, it will improve BITA. However, an important factor is that all relevant stakeholders are assessed, so that there can be a thought-out decision to re-allocate resources where all parties are informed. Good communication results in improved knowledge sharing, which results in new innovative capabilities. The project portfolio contained an overview of all DT initiatives, with their current status. This project portfolio contained all relevant information, regarding the content and performance indicators such as risks and rewards. The communication plan was made on an ad-hoc basis, there was no standardized document and the scope did not exceed the project scope.

Table 7: EA artifacts for DT within Parcel Inc. compared with the model of Grave (2021)

Capability	Purpose	EA Artifacts Grave (2019)	EA Artifacts Parcel Inc.	DT Benefit Parcel Inc.	DT Benefit in practice
Sense	Anticipate	Technology and skills forecast SWOT analysis	Risk and opportunity list	• Innovate • Agility • Customer engagement	Not applicable
Seize	Evaluate	Strategic plan	Strategic Plan	• BITA	• BITA
	Prioritize	Capability development plan Operating model	Year Plan	• BITA • Agility	• BITA
	Mobilize	Impact and risk assessment Business case	Security & privacy assessment PID Business case	• BITA • Agility	• BITA
Transform	Reconfigure processes	Enterprise portfolio	Inception	• BITA • Agility	• BITA
	Reshape IT	Principles and guidelines Security and privacy plan Technology standards list	Landscape maps	• Agility	Not applicable
	Re-allocate resources	Stakeholder communication plan Roadmap	Communication plan Project portfolio	• BITA • Innovate • Agility	• BITA

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5. Discussion, conclusions and recommendations

This chapter contains a discussion of the outcomes and a reflection of the methodology whereby the limitations are identified. Moreover, the recommendations for practice and for further research are discussed.

5.1. Discussion – reflection

DT requires a dynamic response. They require EA-driven dynamic capabilities to facilitate the strategic planning process for DT. Prior work from Grave conceptualized a framework containing EA artifacts that support the strategic planning process, grounded from the DCV. Many practitioners are sceptical about EA artifacts. This study aims to verify if EA artifact can add value to the strategic planning process for DT.

This case study showed that EA artifact need to be reliable, accurate and only represent the minimal amount of information to effectively improve in the speed of decision making in a dynamic environment. This finding ties well with previous studies about the quality of EA artifacts for a dynamic response. The findings on success factors for EA artifacts confirm that top-management support and EA capabilities and capacity are vital in the EA conversion process. This is in line with previous research from Alwadain (2020)

Although no evidence was found to support the exact EA artifact from the model of Grave et al. (2021), a similar pattern of EA artifacts for the strategic planning process was found within the case organization. Comparisons of the EA artifacts purpose with the purpose of the unique EA capabilities, show that at least one EA artifact within Parcel Inc. support the steps of strategic planning process, grounded from the DCV. For instance, the purpose of the EA artifact that is used to sense, was to anticipate new digital opportunities. The purpose of the EA artifacts that are used to seize, evaluate, prioritize and mobilize resources for DT initiatives. And the purpose of the EA artifacts that are used to transform, support the reconfiguration of processes, help reshape the IT landscape and aid in the re-allocation of resources. This is in line with previous studies in EA-driven dynamic capabilities van de Wetering et al. (2020). Resultingly, it provides evidence of EA-driven dynamic capabilities for the strategic planning process.

This study has shown that firms in volatile environments are under severe pressure to create dynamic capabilities. The competitive market, customer expectations and digital technologies are rapidly changing. Hence, the strategic planning process relies on specific EA value drivers for DT at each stage. The EA based sensing capability relies on customer input and a sufficient amount of information to anticipate on new digital technologies. The EA based seizing capability needs a funnel to limit the throughput of DTs to keep focus, an organizational plan to prioritize DTs according to the future state of the company and insights in terms of risks and rewards at the right granularity. This extends the research of Van de Wetering (2019), about the purpose of EA-driven sensing and seizing capabilities for DT. Finally the EA based transformation capability requires insights in the connection between processes and the IT landscape to reconfigure business processes, the EA artifacts should provide the insights to transform the IT landscape towards a decoupled, adaptive digital platform and finally an organizational plan is required for the re-allocation of resources. These findings strengthen the finding of Van de Wetering (2019), about the purpose for EA-driven transformation capabilities for DT.

By meeting the above requirements, EA artifacts can provide value in terms of customer engagement, BITA, agility and innovation. Table 8 provides an overview of the DT benefits found within Parcel Inc. in relation to the found DT benefit from the literature review. The findings will be further discussed in this paragraph. The EA sensing capability results in improved innovation, agility and customer engagement. Therefore it extends the research of Warner and Wäger (2019), because customer engagement, resulting as a DT benefit from EA artifacts was not found in the literature. The EA seizing capability leads to improved BITA and agility. The results indicate that innovation is not an acknowledged benefit. This benefit will be further discussed in the following paragraph. Finally, the EA based transformation capabilities result in BITA, agility and innovation. So, this strengthens the findings of Kurnia et al. (2020), in regards to the benefits coming from EA artifacts.

The EA artifacts support the strategic planning process grounded from the DCV. As a result, the strategic planning process also leads to DT benefits. For instance, the EA artifacts facilitate improved alignment between business and IT and improved customer engagement. Furthermore, they improve the speed of decision making, resulting in improved agility. By reducing the cycle time between sensing and transforming, the time-to-learn improves. This means shorter iterations, resulting in more customer feedback and opportunities for innovative digital possibilities. Therefore it can be argued that the EA driven dynamic capabilities result in innovative capabilities. These findings support the research of van de Wetering et al. (2021) that there is a relationship between EA driven dynamic capabilities and innovation.

The results show that there is a gap between the DT benefit that is expected and the DT benefit in practice. Table 8 provides an overview of the DT benefits found within Parcel Inc. in relation to the DT benefit found in practice. Resultingly, none of the EA artifacts exceeds the DT benefit of BITA. There are two main reasons: First, there is no structural process in place to use the EA artifacts within the strategic planning process. Winter (2003), describes the use of EA artifacts without a structural process as ad-hoc firefighting. Ad-hoc firefighting is not routine and therefore not a dynamic capability (Winter, 2003). These findings strengthens the research of Kotusev et al. (2015) that EA artifact require extraordinary efforts to develop them and keep them up-to date. Second, the quality of the EA artifact does not match the purpose or value drivers of the unique dynamic capability. These findings are in line with previous research from Cammin et al. (2021) that EA artifact require new characteristics for an agile response.

Table 8: EA artifacts for DT from Grave (2021), compared with the value drivers and DT benefit in practice

Capability	Purpose	EA Artifacts Grave (2021)	DT Benefit Grave (2021)	DT Benefit Parcel Inc.	DT Benefit in practice
Sense	Anticipate	Technology and skills forecast SWOT analysis	• Innovate • Agility	• Innovate • Agility • Customer engagement	Not applicable
Seize	Evaluate	Strategic plan	• BITA	• BITA	• BITA
	Prioritize	Capability development plan Operating model	• BITA • Innovate	• BITA • Agility	• BITA
	Mobilize	Impact and risk assessment Business case	• BITA • Agility	• BITA • Agility	• BITA
Transform	Reconfigure processes	Enterprise portfolio	• BITA • Agility	• BITA • Agility	• BITA
	Reshape IT	Principles and guidelines Security and privacy plan Technology standards list	• Agility	• Agility	Not applicable
	Re-allocate resources	Stakeholder communication plan Roadmap	• BITA • Innovate • Agility	• BITA • Innovate • Agility	• BITA

5.2. Conclusion

This study aimed to identify the value of EA artifact, as a result of EA driven dynamic capabilities for the strategic planning process of DT. Based on a single case study where multiple experts were interviewed, it can be concluded that EA artifacts add value to the strategic planning process for DT. EA artifact build EA-driven dynamic capabilities to sense, seize and transform. It can be concluded that EA-driven dynamic capabilities lead to DT benefits such as, BITA, customer engagement, agility and innovative capabilities. More specifically, the EA sensing capability, leads to customer engagement, agility and innovation. Then, the EA seizing capability leads to BITA and agility. Finally, the EA transformation capability leads to improved BITA, agility and innovation for DT. Although there is no evidence of innovative benefits in the seize phase, the research has shown that innovative capabilities come indirect from a learning capability (time to learn). The strategic planning process is seen as a continuous process that enables continuous improvement. Figure 3, provides an overview of the adjusted theoretical framework according to the findings. Here customer engagement is added in blue and the feedback loop is drawn as a blue dotted line. Additionally, the results have shown that DT benefits come from a series of events or value paths. The process starts with investing in EA capabilities to create EA artifact. Followed by using the EA artifacts for the strategic planning process to create EA-driven dynamic capabilities. Consequently, these capabilities result in DT benefits. This extends the results of Alwadain (2020), since the value creation process is also relevant for DTs.
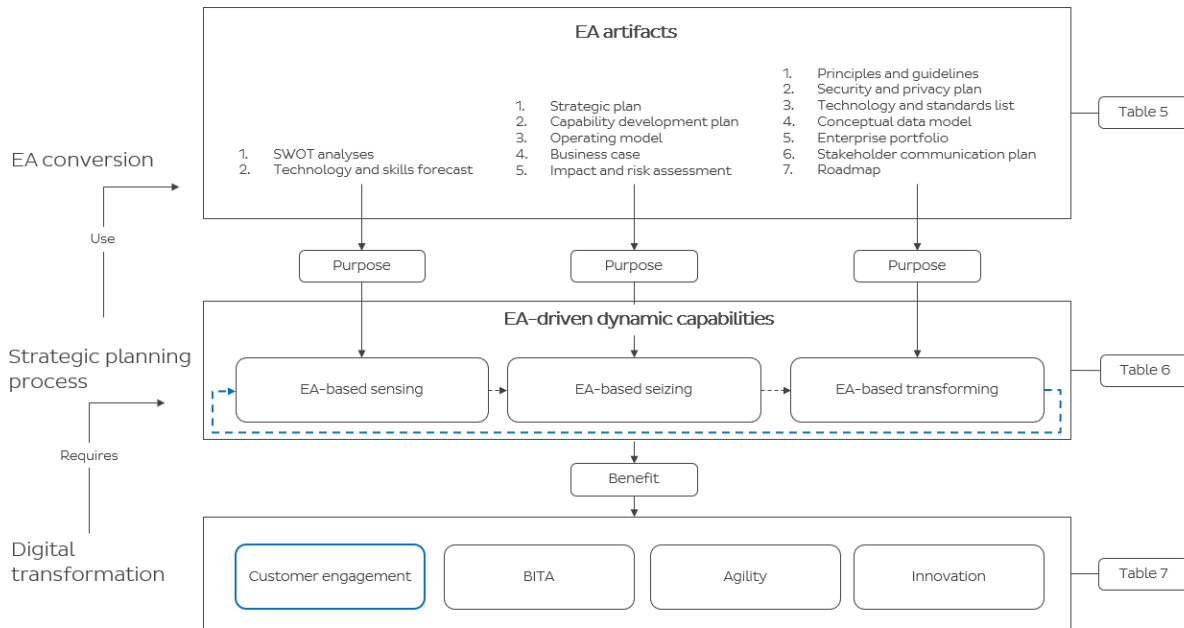
Figure 3: Final model, adding a feedback loop and customer engagement

5.3. Limitations

It is important to understand that there are several limitations to this study.

- Due to qualitative nature of the research a single case-study was chose for the empirical part of the research. Although the case organization has been researched in-depth, the findings are based on this organization only, which raises questions about the ability to generalize the research findings.
- The specific nature of the EA artifacts in the model of Grave (2021) makes it difficult to generalize findings, based on previous research covering this topic.
- The research showed that customer engagement is an important benefit that result from EA driven dynamic capabilities for DTs, however little is known about the impact of EA artifacts on customer engagement.
- This research has also shown that the practical benefits are not in line with the expected benefits. The quality of the EA artifacts that are used in practice are not at the adequate level for DT, however little is known about the required level of quality for EA artifacts that support the strategic planning process for DTs.
- Finally, due to time constraints, I was not able to investigate the organizational benefits that result from the DT benefits.

5.4. Recommendations for further research

There are a number of additional areas for further research that have been highlighted by the studies undertaken for this thesis.

- This includes additional research on this topic to further explore the generalizability of the findings of this study. Preferably, such research would include reviewing various case organizations in differing fields of business (not just the parcel delivery sector) and from multiple experts within the organization that use EA artifacts to support the strategic planning process. This would allow for a more definitive answer to whether and how EA artifacts add value to the strategic planning process of DT.

- Future research should investigate the generalizability of the EA artifacts in the conceptual model from Grave. For instance, this study could further investigate the characteristics of the EA artifacts for DT to conceptualize EA artifact types for DTs to broaden the range of EA artifacts for practical purposes.
- One important finding showed that customer engagement is an important DT benefit resulting from EA driven dynamic capabilities. Due to the limited literature, I would recommend that further investigation is done, by investigating the relation between EA driven dynamic capabilities and customer engagement.
- This research did not go into the reasons for poor quality EA artifacts. It is recommended that these reasons are further investigated by putting the quality of EA artifacts in relation with the EA maturity of the firm.
- Finally, further research is required to investigate the organizational benefits.

5.5. Recommendations for practice

Parcel Inc. operates in a dynamic market. Therefore I recommend to utilize EA artifacts to support the strategic planning process for DT and build EA driven dynamic capabilities. This start with EA investments. High quality EA artifact require the right capabilities, therefore I would recommend to invest in the right skills and capabilities. Additionally, I would recommend to start utilizing the existing EA artifacts according to the requirements from the value drivers and purpose from the model of Grave et al. (2021). DTs will not come easy therefore it is important for sr. management to keep investing in new capabilities to mature in EA and DT.

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Appendix 1: 2D Search

2Dsearch offers an alternative approach in which structured searches can be created by combining Boolean blocks on a two-dimensional canvas. The simplicity, clarity and transparency of the visual approach makes it an ideal tool for understanding the fundamentals of Boolean logic and learning how to create more effective searches.

HOW 2DSEARCH CAN HELP:

- A visual approach which eliminates many errors associated with traditional Boolean strings
- Searches are analysed and common errors detected and corrections offered
- Support for searches across Google Scholar and many specialist databases
- AI-powered query suggestions to help you test and refine your search
- Outputs that may be shared as executable links or exported as traditional Boolean strings

Below an example of the search query. From the visual box, it automatically creates a search string:

Appendix 2: LR mindmap

Below you will find the mindmap created while conducting the literature review. These results were used to build the research model.
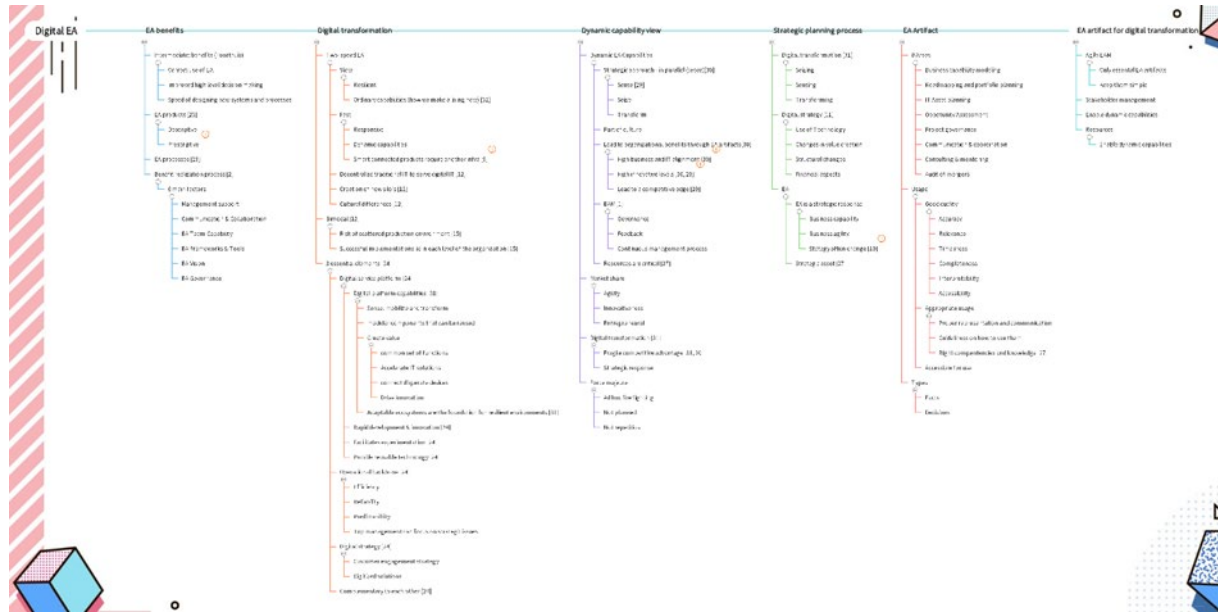
Digital EA

EA benefits

    Intermediate: benefits (Foorthuis)
- Correct use of EA
- Improved high level decision making
- Speed of designing new systems and processes

    EA products [23]
- Descriptive
- Prescriptive

    EA processes [23]

    Benefit realization process [2]
- 6 main factors
  - Management support
  - Communication & Collaboration
  - EA Team Capability
  - EA Frameworks & Tools
  - EA Vision
  - EA Governance

Digital transformation

    Two-speed EA
- Slow
  - Resilient
  - Ordinary capabilities (how we make a living now) [32]
- Fast
  - Responsive
  - Dynamic capabilities
  - Smart connected products require another infra [9]
- Decentralize traditional IT to serve digital IT [12]
- Creation of new silo's [12]
- Cultural differences [12]

    Bimodal [12]
- Risk of scattered production environment [15]

32

- Successful implementations lie in each level of the organization [15]
- 3 essential elements [24]
  - Digital service platform [24]
    - Digital platform capabilities [28]
      - Sense, mobilize and transform
      - modular components that can be reused
      - Create value
        - common set of functions
        - Accelerate IT solutions
        - connect disperate devices
        - Drive innovation
      - Adaptable ecosystems are the foundation for resilient environments [33]
    - Rapid development & innovation [24]
    - Facilitates experimentation [24]
    - Provide reusable technology [24]
  - Operational backbone [24]
    - Efficiency
    - Reliability
    - Predictabiltity
    - Top management can focus on strategic issues
  - Digital strategy [24]
    - Customer engagement strategy
    - Digitized solutions
  - Complementary to each other [24]

Dynamic capability view
- Dynamic EA Capabilities
  - Strategic approach - in parallel (teece)[30]
    - Sense [29]
    - Seize
    - Transform
  - Part of culture
  - Lead to organizational benefits through EA artifacts[30]
    - High business and IT alignment [30]
    - High innovative levels [30, 29]
    - Lead to a competitiive edge [29]
  - EAM [1]
    - Governance
    - Feedback
    - Continuous management process
  - Resources are critical [27]
- Market share
  - Agility
  - Innovativeness
  - Entrepreneural
- Digital transformation [31]
  - Fragile competitive advantage [31, 30]
  - Strategic response
- Force majeure
  - Ad hoc fire fighting
  - Not planned
  - Not repetitios

Strategic planning process
- Digital transformation [31]
  - Seizing
  - Sensing
  - Transforming
- Digital strategy [11]

33

- Use of Technology
- Changes in value creation
- Structural changes
- Financial aspects

EA
- EA is a strategic response
  - Business capability
  - Business agility
  - Stategy often change [19]
- Strategic asset [27]

EA Artifact

8 Areas
- Business capability modeling
- Roadmapping and portfolio planning
- IT Asset planning
- Oppotunity Assessment
- Project governance
- Communication & coordination
- Consulting & mentoring
- Audit of mergers

Usage
- Good quality
  - Accuracy
  - Relevance
  - Timeliness
  - Completeness
  - Interpretability
  - Accessibility
- Appropriate usage
  - Proper representation and communication
  - Guideliness on how to use them
  - Right compentencies and knowledge [27]
- Accessible for use

Types
- Facts
- Decisions

EA artifact for digital transformation

Agile EAM
- Only essental EA artifacts
- Keep them simple

Stakeholder management

Enable dynamic capabilities

Resources
- Enable dynamic capabilities

Appendix 3: EA artifacts

EA Artifact	Description
Technology and skills forecast	
SWOT analysis	
Strategic plan	
High-level operational concept	
Capability development plan	
Operating model	
Impact and risk assessment	
Business case	
Enterprise portfolio	
Conceptual data model	
Principles and guidelines	
Security and privacy plan	
Technology standards list	
Stakeholder communication plan	
Roadmap	

Appendix 4: Introduction to the topic

Slide 1

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Slide 2

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Slide 4

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Appendix 5: Questionnaire

EA professionals, strategische IT adviseurs en (IT) leiders

Chief Strategy & Information officer (CIO)

Chief Executive Officer (CEO)

Chief Digital Officer (CDO)

EA architecten

IT solution architecten

Managers

Product Owner

Gegevens Student	*Mathijs Noordzij*
Hoofdvraag	*Hoe creëren EA artifacts waarde in het strategische planningsproces voor digitale transformaties?*
Deelvraag 1	*Welke EA artifacts worden gebruikt binnen de organisatie om het strategische planningsproces te ondersteunen voor digitale transformaties?*
Deelvraag 2	*Hoe creëren EA artifacts waarde voor het strategische planningsproces voor digitale transformaties?*

	ALGEMENE INTRODUCTIE | TIJDSDUUR: 15 MIN.	
	Het interview wordt geïnitieerd met de informatie hieronder.	
Sheet 1	Introductie en benoemen doel van het onderzoek	Mijn naam is Mathijs Noordzij. Ik ben een student en onderzoeker aan de Open Universiteit en neem dit interview af. Dit interview en mijn onderzoek heeft als doel om te onderzoeken wat de toegevoegde waarde van Enterprise Architecture (vanaf nu EA) is bij digitale transformaties.
	Participant bedanken	Bij deze wil ik u bedanken dat u mee wilt doen aan dit onderzoek. Als het goed is, heeft u de interviewvragen van tevoren ontvangen. Zijn deze in goede orde ontvangen en heeft u eventuele vragen of opmerkingen?
Sheet 2	Doel van de case study	EA kan volgens velen voor organisaties een belangrijk middel zijn bij de implementatie van hun IT strategie. In de wetenschappelijke literatuur is het echter vrij onduidelijk hoe EA dit doet. Dit interview maakt onderdeel uit van een kwalitatieve case study, die als doel heeft om dit te verduidelijken. Dit wordt gedaan door te onderzoeken wat de toegevoegde waarde van EA is bij een van de grootste strategische uitdagingen van dit moment: digitale transformaties. Tijdens deze case study interview ik een aantal professionals die zich bezighouden met EA en de strategische planning rondom digitale transformaties. Via de interviews worden hun ervaringen rondom het gebruik van EA documentatie, ook wel 'artifacts' genoemd, vastgelegd. Hun verhalen zullen worden gebruikt bij de verkenning naar welke EA artifacts een toegevoegde waarde bieden bij digitale transformaties.
Sheet 3	Uitleg van concepten en achtergrond van het onderzoek	Tijdens het interview zal ik de respondent een introductie geven van ongeveer 10 minuten. In deze introductie worden de belangrijkste concepten gepresenteerd. Daarna heeft de respondent nog 5 minuten om vragen te stellen over de concepten.
Sheet 4	Onderwerpen	De volgende onderwerpen zullen besproken: • De achtergrond van de interview kandidaat • De betrokkenheid van de interview kandidaat bij digitale transformaties, strategische planningsproces en EA • Beschikbaarheid van EA artifacten • Gespecificeerde vragen voor bepaalde rollen in de organisatie.

	Privacy en vertrouwelijkheid	Uw persoonlijke data zal niet gebruikt worden. Allen uw functie en rol binnen digitale transformaties zullen benoemd worden. De informatie die wordt verschaft zal alleen voor wetenschappelijke onderzoeksdoeleinden gebruikt worden.
	Het vroegtijdig stoppen van het interview	Indien u gedurende enig moment tijdens het interview wilt stoppen, kunt u dit kenbaar maken. Het interview zal dan direct stoppen.
	Opname van het interview	Ten behoeve van analyse wil ik de audio van dit interview graag opnemen. Dit zal ik doen met de opname apparatuur die ik heb meegenomen. Ik zal dus geen schermopnames maken van Microsoft Teams. De audio opname zal getranscribeerd worden naar een tekstdocument en deze tekst zal in het onderzoek gebruikt worden voor analyse ten behoeve van het onderzoek van mijzelf en de Open Universiteit. **Bij deze vraag ik u om toestemming voor het opnemen van dit interview.**
	Type vragen die gebruikt worden	Soorten vragen: Hoe vragen: zegt iets over ervaringen, benaderingen of acties; Wat vragen: zegt iets over de context/ inhoud; Welke vragen: zegt iet over type en soort;

		SPECIFIEKE INTERVIEWVRAGEN | TIJDSDUUR: 40 MIN.
		ALLE ONDERWERPEN UIT DE (HOOFD) ONDERZOEKSVRAGEN WORDEN BEHANDELD
Sheet 5	**Vragen over de kandidaat** **Onderwerpen:** Loopbaan Opleiding Rol	**Zou je wat over je educatieve achtergrond, organisatorische positie en relatie met EA en strategische processen kunnen toelichten?** Probe vragen: Wat voor werk doet u? Wat zijn uw verantwoordelijkheden binnen uw huidige rol? Welke andere rollen heeft u hiervoor vervuld? Hoelang werkt u al binnen dit bedrijf?
	Digitale transformaties **Onderwerpen:** Strategische keuzes Totstandkoming van DT's	**Met wat voor digitale transformaties heeft u in uw huidige rol te maken gehad?** Probe vragen: Wat waren de strategische keuzes achter deze transformaties? Hoe zijn deze strategische transformaties tot stand gekomen? Welke technologieën zijn er gebruikt?
	Digitale transformaties **Onderwerpen:** Sense Seize Transform	**Wat is uw rol binnen het strategische planningsproces van digitale transformaties?** Probe vragen: Wat is uw rol in het herkennen van nieuwe digitale opportunity's? Wat is uw rol in het evalueren, prioriteren en het mobiliseren van resources voor een strategische richting? Wat is uw rol in het transformeren van bedrijfsprocessen, IT landschap of het re-alloceren van resources?
	Digitale transformaties **Onderwerpen:** Business & IT alignment	**Wat is uw relatie met de EA om het strategische planningsproces?** Probe vragen: Hoe ondersteunt u de business? Hoe ondersteunt u IT? Hoe brengt u de twee werelden bij elkaar? Waar loopt u tegen aan?

SPECIFIEKE DEELVRAGEN		
Welke EA artifacts worden gebruikt binnen de organisatie om het strategische planningsproces te ondersteunen voor digitale transformaties? EA artifacts zijn de documenten die de organisatie of een deel daarvan beschrijven. Het doel van deze documenten variëren per stap in het strategische planningsproces. Het doel voor EA artefacts in de fase 'sense' is om te anticiperen op nieuwe digitale technologieën. In de fase 'seize' is het doel van EA artifacts om de digitale technologieën te evalueren, prioriteren, selecteren en resources vrij te maken om het uit te voeren. In de fase 'transformeren' worden EA artifacts gebruikt om de organisatie en het IT landschap te re-configureren en resources te re-alloceren.		
Sheet 6	**Inzet van EA artifacts voor het strategische planningsproces**	**Welke EA artifacts worden gebruikt binnen de organisatie om het strategische planningsproces te ondersteunen voor digitale transformaties? (zie slide voor voorbeelden)** Probe vragen: Welke EA artifacts worden gebruikt in de 'sense' fase? Welke EA artifacts worden gebruikt in de 'seize' fase? Welke EA artifacts worden gebruikt in de 'transform' fase? Hoe worden deze artefacten gebruikt en onderhouden? Welke EA artifacts worden nog meer gebruikt?
Sheet 7	**Waardes van EA artifacts**	**Hoe creëren EA artifacts waarde voor het strategische planningsproces voor digitale transformaties?** Probe vragen: Wat was de toegevoegde waarde van de EA artifacts die gebruikt worden in de sense fase van het strategische planningsproces? Wat was de toegevoegde waarde van de EA artifacts die gebruikt werden in de seize fase van het strategische planningsproces? Wat was de toegevoegde waarde van de EA artifacts die gebruikt werden in de transform fase van het strategische planningsproces? Wat zijn de tekortkomingen van de EA artifacts? Wat is het belang van de kwaliteit van de EA artifacts? Welke EA artifacts kunnen nog meer waarde toevoegen?
Sheet 9	**Het gebruik van EA artifacts in dit onderzoek**	**Is het mogelijk om de genoemde EA artifacts op te leveren voor dit onderzoek, zodat de onderzoeker kan valideren dat deze artifacts bestaan?** Probe vragen: Waarom niet? Wat zou een eventuele andere mogelijkheid kunnen zijn?

	Specifieke vragen voor IT-leiders en strategische IT adviseurs	
Sheet 10	**Het belang van EA artifacts en dynamic capabilities bij digitale transformaties** **Onderwerpen:** Het belang van EA artifacts Het belang van dynamic capabilities	**Hoe belangrijk waren EA artifacts en dynamic capabilities bij het realiseren van digitale transformaties?** Probe vragen: Hoe belangrijk zijn dynamic capabilities voor de organisatie? Wat is in uw ogen het belang van een dynamische EA voor de organisatie? Heeft de organisatie de juiste interne kennis en vaardigheden voor het digitaliseren van de organisatie?
	Specifieke vragen voor EA professionals	
	Het belang van EA artifacts en dynamic capabilities bij de ondersteuning van digitale transformaties **Onderwerpen:** Toegevoegde waarde	**Hoe belangrijk waren EA artifacts en dynamic capabilities in de ondersteuning van digitale transformaties?** Probe vragen: Hoe wordt er vanuit EA gestuurd op het gebruik en onderhouden van EA artifacts? Op welke manier wordt er gestuurd op een dynamische EA vanuit de dynamic capability view? Welke EA artifacten behoren binnen het beheer van de EA architect? Hoe volwassen is de EA binnen DPD?
	CONCLUSIE VAN HET INTERVIEW | TIJDSDUUR: 5 MINUTEN	
	Het interview wordt afgesloten	
Sheet 11	**Conclusie**	Ter conclusie wil ik graag vragen of u wil aangeven of ik bepaalde relevante onderwerpen over het hoofd heb gezien en/of u nog iets zou willen toevoegen. Hoe heeft u dit interview ervaren?
	Validiteit, betrouwbaarheid en ethische aspecten	Ik zou u graag willen vragen of u de resultaten van dit interview zou willen controleren om te kijken of deze overeenkomt met de waarheid en hetgeen dat wij tijdens het interview hebben besproken.
	Een dankwoord	Ik zou u graag willen bedanken voor uw deelname aan dit interview. Heeft u het gevoel gehad dat u alles kon vertellen?
	Contactinformatie	Als u nog vragen heeft over dit interview, kunt u die sturen naar m.noordzij@dpd.nl Ook kunt u bellen of een berichtje sturen naar 0625.

Appendix 6: In vivo codes

Color	Code
●	(SW)OT
●	Accessible way of communicating
●	Ad-hoc
●	Agility
●	Benelux BU
●	BI & Data science
●	Bi-directional alignment
●	BITA
●	Black box
●	Blind to impact
●	Bottom-up
●	Bridge towards Group
●	Business case/ PID
●	Business value
●	Can do mentality
●	Capability development plan
●	Capacity IT
●	Capacity planning
●	Challenge business
●	Changing markets
●	Communication plan
●	Complexity
●	Compliancy
●	Control
●	Custom clearance
●	Customer expectation
●	Customer oriented
●	Customers become competitors
●	Data inbetween BIT
●	Data initiatives carried by board
●	Data investments
●	Decentralized and harmonized
●	Development
●	Difference project and initiative
●	Difficulties in culture
●	Digital
●	Digital competitors
●	Digital customer
●	Digitization of DPD
●	Documentation business processes

- Documentation discipline
- Dynamic Market
- EA investments
- EA maturity
- EA vision
- Efficiency
- Enterprise data model
- Enterprise portfolio
- Fast Track
- Focus
- Fragmented knowledge IT
- From adhoc to integral planning
- Future in data
- Future proof IT
- Gap Business & IT
- Governance
- Granular optimization models
- Group alignment
- Group/BU IT alignment
- Harmonize local autonomy & differences
- Impact analyses
- Important
- In line with strategic planning process
- Inadequate capabilities IT
- Inadequate systems
- Inception
- Incompatibility processes and business
- Incompatible business and customer
- Incompatible processes & IT
- Incompatible processes and business
- Incompatible processes and IT
- Investment resources
- Lack of capacity IT
- Legacy
- Link IT & Business
- Logistics
- Looking at other DPD BU's
- Maturing digital capabilities
- Merge strategy and IT
- Mitigate risks
- Mobilize
- More important to start and improve
- Necessity

- New capability, but no plan
- Next legacy
- No architecture
- No BITA
- No description of processes
- No group system
- No integral plan
- No standardized processes
- On prem to cloud
- Operating model
- Operations
- Optimization business and IT
- Organization plan
- Organization structure
- Own initiative
- Predict
- Pressure business model
- Principles & guidelines
- Prioritize
- Project management
- Project portfolio
- Pull down data flows
- Quality
- RACI
- Receiver oriented
- Rely on vendors
- Requires loosly coupled systems
- Resource capabilities
- Results in organized accurate planning
- Rigid model
- Route optimization
- Rushed decisions
- Scope dependent
- Security & Privacy plan
- Seize
- Seize & Transform
- Sense of urgency
- Sense opportunities & threats
- Silo-architecture
- Skipping steps
- Slow
- Speed
- Stability & Agility

●	Start I&A
●	Steering group
●	Strategic plan
●	Strategic planning
●	Too little use
●	Top down decision
●	Top management support
●	Transparancy
●	Transparancy & agility
●	Unconciously active
●	Underestimate feasibility
●	Year plan: department
●	Young industry

Appendix 7: EA artifacts within Parcel Inc. (Confidential)

PID, containing all relevant information to initiate a program or project.

Project portfolio, containing all relevant information to re-allocate resources

Year plan, containing high-level ideas for the next year. Quality is quite poor, since it is a vague direction with no clear site on where the organization stands or is moving towards
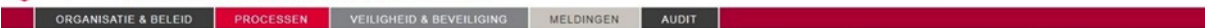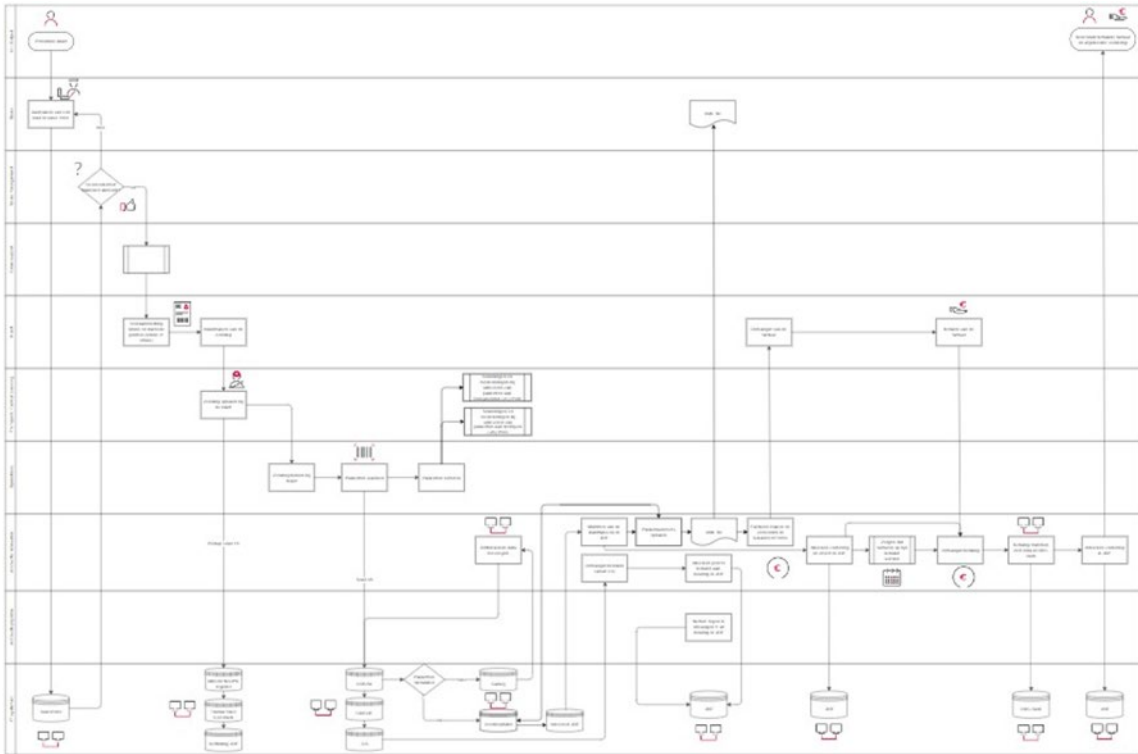

3.4.3 | Digital Transformation
Climb the digital maturity ladder to strengthen customer experience
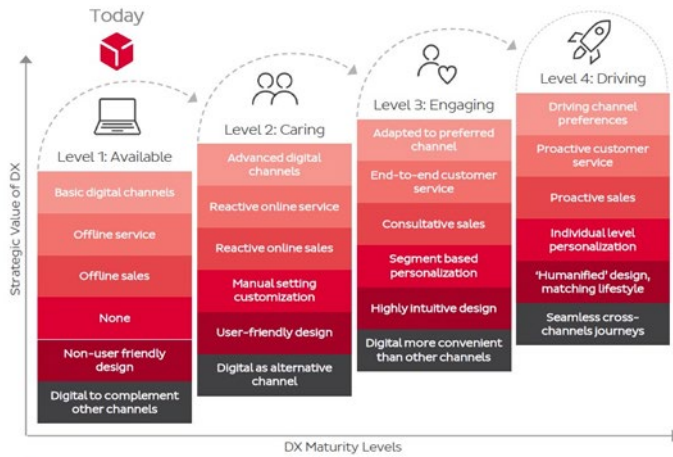
Next level:

- Partner with IT to dissolve technical debt (Fasttrack) and get started on the path of digital agility

- Customer-centric design and continuous development to get on par with market standards (MyDPD, mobile, Predict, business portal)

- Deliver end-to-end quality by improving manageability of services and underlying core systems & processes (OOH services). Establish group convergence (parcel journey, day definite).

- Enable empowered dynamic cross-functional teams by providing them the tools to grow business and adapt to our evolving market (Salesforce, etc.)

Inception is a BPM tool that is hosted within the DPD network. Quality is also poor since, it is really detailed and unreliable

Appendix 8: EA value drivers for the strategic planning process

Anticipate	
Value drivers	According to many of the respondents, the EA artifacts in this stage should represent the customer's interests *"Everything start with the question, what does the customer wants? – CDO"*. Therefore, it goes beyond BITA and straight towards the needs of the customer. Hence, it can be argued that these EA driven capabilities result in improved customer engaged DT's. Accordingly, the EA artifacts should provide enough information to narrow the scope of the search. This results in improved quality and time to search, which benefits agility. The insights from the feedback loops, should provide the information
Compatible Grave	The sr. innovation specialist claimed that the proposed EA artifacts (SWOT-Analyses and Technology & Skills forecast) will lead to the above benefits, if the EA artifacts are used according to the described requirements.
Compatible practice	The found opportunity and risk list does not provide the benefits that are required for this
Evaluate	
Value drivers	To evaluate the digital initiatives from the previous stage, it is important to keep in mind that the strategical direction is in line with the strategic direction of the entire enterprise. Therefore, it goes beyond the needs of the BU alone.
Compatible Grave	During the seize phase, the strategic plan is used to evaluate the consistency between group and BU it initiatives and objectives. Therefore it aligns IT strategy across the group with the initiatives of the BU's, this results in business and IT alignment across the group.
Compatible practice	Yes
Prioritize	
Value drivers	According to the CDO, DT's requires a change in business models that goes beyond re-allocating resources. This change requires working towards an organizational plan. DT initiatives should be (2) prioritized accordingly to work towards that goal, which requires discipline and patience, because DT's do not go without hurdles "With DT's there will be friction and if it will not go as planned, people will escalate and then the one that shouts the loudest will get their way. That is the illness of DPD, it is always about the volumes, it is always about the short term – CDO". Therefore it can be concluded that the prioritization of DTs is a crucial element for aligning future IT and business interests. As a result the EA artifacts used can play a crucial role in BITA. The manager I&A, added that the EA artifacts in this stage will give insights into the feasibility of a DT. Therefore it will speed-up the decision making in this stage. This will improve agility.
Compatible Grave	The described organizational plan is in line with the characteristics of the capability development plan, high level operational concept and operational model, since they facilitate an overview of the direction of the organization or a part of that.
Compatible practice	
Mobilize	
Value drivers	According to the CSIO the business should have a good image of the requirements that they need and the EA artifacts should represent those

	requirements, in terms of the benefits, costs, risks and effort. Doing so will result in improved BITA. Additionally the size of the project or DT initiative should determine the level of detail for these EA artifact. A granular approach would therefore make sense "You don't want to set-up the whole circus, because then you will lose a lot of speed – CSIO". Resultingly, you will become faster, because there is no need to document unnecessary elements, while having all the relevant data to speed-up decision-making.
Compatible Grave	The proposed EA artifacts result in BITA and agility, if the described requirements are met.
Compatible practice	The PID, business case and security and privacy plan enable BITA, because it enables cross department alignment to achieve IT and business goals and reduce the risk of vulnerability. The PID results in fast decision making, since it is easy to create and contains all relevant data to make a decision. The business case are used for larger projects. However, they are created ad-hoc and not according to a template. Therefore much time is lost figuring out which information is required. Therefore, quality is poor. The security and privacy plan is also made ad-hoc. Additionally it contains many question, which make it difficult and time consuming to fill in. There is no granularity in that document.
Reconfigure business processes	
Value drivers	According to the many of the respondents, a map of the IT landscape in connection to the business processes is missing. And that connection to the business processes is exactly what is required to align business with IT "We are trying to reshape the IT landscape, however the connection to the business processes is missing – Manager I&A". DT requires fast movements and constant change. However the Director IT claims that it is difficult to change something that is not there (or at least not documented) "How can we change our landscape if we don't know how our landscape looks like". In order to regain speed in the reconfiguration of business processes, it is required to gain enough insights in the processes related to the IT landscape, without making it too detailed.
Compatible Grave	Many of the respondents agreed that an enterprise portfolio could close the gap "Because if you have an enterprise portfolio, you can be more decisive, because you know how IT supports the business – Director IT"
Compatible practice	The EA artifact to re-configure processes within the case organization is Inception. Inception is also highly detailed and therefore not contributing to agility or process innovative capabilities "Inception is a tool where we can document processes, however it does not provide the flexibility to easily bend or re-configure business processes in an agile manner – CSIO" .
Reshape IT	
Value drivers	According to the CEO, the market where its firm is operating in, is becoming more dynamic each year. In order to stay competitive, it is important to have a simple, efficient, reliable and agile IT landscape *"Agility requires the elimination or contamination of redundant complexity. For instance, it requires decoupled application that can be stacked, re-stacked and unstacked like Lego blocks – CEO"*. EA artifacts that facilitate the standardization of application within the IT landscape can therefore benefit agility. Moreover, it will speed-up the decision-making process. In addition to that, the Director Projects claims that it is important to make them not to

	strict. Because, when there is no room to think outside the box, it can have a negative effect on innovative skills *"Shortcomings to the EA artifacts, might result in the loss of innovative capabilities. The defined paths, models and structures, might lead to too much standard solutions, taking away the creative and spontaneous solutions.– Director Development"*.
Compatible Grave	
Compatible practice	To reshape the IT landscape, the IT landscape maps are used within the case organization. However, they are very detailed and are created ad-hoc. Therefore they do not contribute to, rapid decision making, because they need to be checked on accuracy when they are re-used. Additionally, they do not have the element of standardization in it.
Value drivers	To be in control of all initiatives it is important that they are all in scope. Hence, it is important to have a total overview of alle initiatives. If there is a good overview, it will become easier to re-allocate resources Hence it will improve BITA. However, an important factor is that all relevant stakeholders are assessed, so that there can be a thought-out decision to re-allocate resources where all parties are informed. Good communication results in improved knowledge sharing, which results in new innovative capabilities. The project portfolio contains an overview of all DT initiatives, containing their status. This project portfolio contains all relevant information, regarding the status, content and performance indicators like risks and rewards. The communication plan is made on an ad-hoc basis, there is no standardized document and the scope does not exceed the project scope *"Roadmap is within the project portfolio and communication plan is embedded in the process of projects. However, it would make sense to broaden the scope of the communication plan – Director Development"*
Compatible Grave	
Compatible practice	However the communication plan is made on an ad-hoc basis, there is no standardized document and the scope does not exceed the project scope *"Roadmap is within the project portfolio and communication plan is embedded in the process of projects. However, it would make sense to broaden the scope of the communication plan – Director Development"*