

The Exploring Digital Framework

A Digital Roadmap for the Emerging Role of the CDO

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As we are witnessing an explosion of novel digital technologies and concepts, companies find it increasingly difficult to set the right digital priorities and pursuit the right digital initiatives. The hypothesis is that this problematic situation partially derives from an absence of mental frameworks and tools for exploring, navigating, and structuring digital strategy and digital transformation. The Exploring Digital Framework was developed to fill this void, and to assist the emerging role of the CDO. This framework has multiple areas of applicability: to ensure alignment and execution of an existing digital strategy, to build a digital strategy, and to assist practitioners in high-level digital assessments. It could also be used for educational purposes – for example to solve cases or facilitate discussions within university courses.

Introduction

Discussions of digitalization have been buzzing for decades and the digital phenomenon never seems to step outside the spotlight of attention. While digitalization in the 1970s probably referred to the mass adoption of personal computers, today we speak of Industry 4.0, e-commerce, digital servitization, machine learning, artificial intelligence (AI), blockchain technologies, cloud computing and big data. As new digital technologies and concepts arise, the inherent meaning of digitalization broadens. What digitalization *is* seems to be dynamic and ever-growing.

The explosion of novel digital technologies and concepts make it increasingly difficult for companies to navigate their business environment and secure long-term business prosperity. Companies are exposed to numerous digital technologies and concepts of various character and thereof face a digital crossroad that induces directional uncertainty and transformational complexity (Furr & Shipilov, 2019). That

is; *what* digital initiatives to pursuit and *what* digital priorities to set, *how* and *why* to approach digital transformation, *who* should drive digital transformation and *when*?

Not only are we witnessing an explosion of novel digital technologies and concepts, but also a paradigm shift in terms of the characteristics of digitalization (Dumeresque, 2014). Historically, hardware has been leading in terms of substantial business value. In this new digital era, the software revolution is surging – with digital servitization emerging as a consequence. Companies have started to move away from their previous way of structuring for digital transformation, in which the IT department, reporting to a chief information officer (CIO) or even a chief financial officer (CFO), has driven the digital agenda. With increasing pressures of this new era of digital transformations, we can now witness the uprising of the chief digital officer (CDO).

With the increasing uncertainty and complexity that surrounds digital, the emerging role of the CDO stands before a daunting task – to ensure that big and old companies accompany digitalization successfully. The difficulty of this situation seems to partially derive from the absence of mental frameworks and tools to explore, navigate, and structure companies' journeys of becoming more digital.

Sorting Out Confusing Terminology

The terminology that surrounds digital could surely be confusing – let us try to get some of the basic concepts straight.

Digitalization is an ever-growing and dynamic term that describes the trend in which companies introduce more and more digital technologies and concepts to reshape customer value and enhance the company's capabilities to create and deliver this value.

Digital strategy is a fusion between IT strategy and business strategy. It resembles a guiding direction and plan of actions to withstand digital turbulence in the business environment and to obtain a desirable competitive position through reshaping, creating, and delivering customer value by leveraging digital technologies and concepts.

Digital transformation is carrying through digital initiatives to accompany digitalization with the goal of building towards the priorities set by the digital strategy.

That is, digitalization is the overall trend of digital development, digital strategy is the direction a company establishes to accompany the trend of digitalization, and digital transformation is carrying through actions in the direction set by the digital strategy.

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As the premise underlines, companies seem to struggle to make the right digital

priorities and to pursue the right digital initiatives. A hypothesis is that this problematic situation partially derives from an absence of mental framework and tools to explore, navigate, and structure digital. For companies to not get overwhelmed by the extensiveness of digital, digital must be broken down into comprehensible sub-dimensions.

Several researchers have previously discussed ways of breaking down approaches towards becoming more digital. Sebastian et al (2017) highlight two sides of digital strategy: the digitized solution strategy and the customer engagement strategy. Berman (2012) formulated two paths of digital strategy, much like the two sides of digital strategy proposed by Sebastian et al (2017). Berman's (2012) two paths consist of the customer value proposition and the operating model. In addition to this, Berman (2012) introduces the dimension of infrastructure and processes. This infrastructure and process dimension is also supported by Hess et al (2016), but under the name of "structural changes". Academia seems to stand united on the aggregative dimensional picture of ways of breaking down digital. There is however minor variation in terms of the bundling and separation of these dimensional aspects, as well as in the exact denominations of these sub-dimensions.

Becoming more digital is value-centric. By combining the viewpoints of previous researchers, digital is broken down into the following three sub-dimensions:

- The value propositions – digitally reshape the value itself
- Infrastructure and processes – digitally transform value creation
- Customer engagement – digitally enhance value deliverance

The value proposition is what the customer ultimately pays for – products and services. Infrastructure and processes are everything that either enable value creation or directly create value – for example supporting organizational structure and manufacturing processes, respectively. Customer engagement refers to everything that is related to either the interaction with customers or the transaction of value from the organization to customers.

With digital broken down into three sub-dimensions, a follow-up question emerges: what areas are relevant to explore, navigate, and structure using these three sub-dimensions? Looking at how organizational transformation traditionally is discussed, it essentially comes down to mapping the as-is, envision or creating the to-be, mapping recent, current, and upcoming transformation initiatives, and identifying drivers and challenges. Or, in the context of digital transformation:

- Digital state – the current, or “as-is”, situation of digital maturity
- Digital vision – the vision, or desired “to-be”, of a digitally enhanced future business
- Digital initiatives – recent, current, and upcoming digital transformation initiatives
- Digital drivers – what and who drive the direction and pace of digital development
- Digital challenges – the resistances, trade-offs, and dilemmas companies face when digitally transforming their business

By combining these five transformational areas with the three value-centric sub-dimensions of digital, the Exploring Digital Framework is formed.

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	Digital state	Digital vision	Digital initiatives	Digital drivers	Digital challenges
	Where are we in terms of digital development?	What are our digital priorities?	What are we doing to approach our digital vision?	What and who are driving our digital transformation?	What are the resistances, trade-offs, and dilemmas?
Value proposition Reshape value	What is the current digital state of our value proposition?	How do we envision our digitally reshaped value proposition, and what priorities correspond to this vision?	What digital initiatives are we pursuing to digitally reshape our value proposition?	What and who are driving the pace and direction of the digital transformation of our value proposition?	What resistances, trade-offs and dilemmas are we facing when digitally transforming our value proposition?
Infrastructure & processes Transform value creation	What is the current digital state of our infrastructure and processes?	How do we envision our digitally transformed infrastructure and processes, and what priorities correspond to this vision?	What digital initiatives are we pursuing to digitally transform our infrastructure and processes?	What and who are driving the pace and direction of the digital transformation of our infrastructure and processes?	What resistances, trade-offs and dilemmas are we facing when digitally transforming our infrastructure and processes?
Customer engagement Enhance value deliverance	What is the current digital state of our way of engaging with customers?	How do we envision our digitally enhanced way of engaging with customers, and what priorities correspond to this vision?	What digital initiatives are we pursuing to digitally enhance our way of engaging with customers?	What and who are driving the pace and direction of the digital transformation of our way of engaging with customers?	What resistances, trade-offs and dilemmas are we facing when digitally transforming our way of engaging with customers?

Case Study: Examples from the Swedish Manufacturing Industry

To validate the Exploring Digital Framework, a comparative case study of two large cap Swedish manufacturing companies was conducted. This case study is based on interviews of company representatives on upper and top management level, with the Exploring Digital Framework acting as an interview guide. Short summaries of the case study and its two case companies are found in the following tables.

Company A
<p>Digital state:</p> <ul style="list-style-type: none"> ▪ Physical products with no substantial digital service offerings. The value lies in the hardware. ▪ Self-proclaimed digitally mature with Industry 4.0 in place. Has an explicit digital strategy, clear ownership through a CDO, supporting organizational structure and a governance model for digital transformation. Infrastructure and processes have been the primary focus area. ▪ Has not focused on customer engagement. Thus, customer engagement is of traditional and conventional nature. <p>Digital vision:</p> <ul style="list-style-type: none"> ▪ Utilize connectivity and traceability to enable digital servitization through a Platform as a Service (PaaS). This PaaS aims to reveal new business opportunities and create new revenue streams from new customers – and also tap the aftermarket business potential. Technologically confident but uncertain of business implications of a digitally extended value proposition. ▪ Doing more of what is already being done, which means further strengthening the operational backbone and manufacturing processes. Wants to strengthen way of developing skill sets and attracting new digital talent. ▪ Customer engagement is still not a high priority. Aims for spillover effects from digital advancements in value proposition and infrastructure and processes. <p>Digital initiatives:</p> <ul style="list-style-type: none"> ▪ Developing a PaaS solution from scratch ▪ CIO recently shouldered CDO responsibilities to clarify ownership. New governance model for digital transformation. New datacenters to further strengthen operational backbone. Investigating ways of being more attractive to digital talent. ▪ No substantial digital initiatives for customer engagement. Instead, emphasis is on spillover effects. <p>Digital drivers: CDO drives the digital agenda in all areas</p> <ul style="list-style-type: none"> ▪ Increased revenue, new business opportunities, and strengthened core values. ▪ Efficiency gains and leaner operations. ▪ Customer expectations and competitive aspects. <p>Digital challenges:</p> <ul style="list-style-type: none"> ▪ Avoiding digital debt. Change management. Business model reinvention. Balance new digital talent with existing expertise. ▪ Focusing efforts. Prove business cases and benefits. Find the right pace of digital transformation. ▪ Grasping and meeting customer expectations. Realize sought spillover effects.

Note: The three bullets under each area represents the value proposition, infrastructure and processes, and customer engagement, respectively.

Company B
<p>Digital state:</p> <ul style="list-style-type: none"> ▪ Physical products with no substantial digital service offerings. The value lies in the hardware. ▪ Conducts digital assessments and benchmarking that show low maturity, especially for infrastructure and processes. Has no explicit digital strategy, and no distinctive directions from top management except from “digitalize more”, responsibility and ownership are decentralized to business unit level. ▪ Digital up until and including the purchase. Has a product configurator and utilizes QR codes technology to digitally interact with customers. This has been the main focus area. <p>Digital vision:</p> <ul style="list-style-type: none"> ▪ Utilize connectivity and traceability to enable digital servitization through a service platform based on QR code technology. This aims to tap business potential in the aftermarket. Technologically confident but uncertain of business implications of a digitally extended value proposition. ▪ Redirect focus from customer engagement to infrastructure and processes. Establish unified and supporting organizational structure with clear ownership. Obtain leaner operations through smart manufacturing. ▪ Customer engagement is not the primary focus area anymore, but still wants to get digitally closer to the customer with bidirectional sharing of data. Wants to extend QR code technology service platform with more digital services and digitally transform the customer experience without losing human characteristics. <p>Digital initiatives:</p> <ul style="list-style-type: none"> ▪ Investigating and small-scale testing of connectivity solutions. Applying QR codes on most products. ▪ Creating ad hoc groups for digital transformation related to connectivity and online sales. Conceptual testing of smart manufacturing, and establishment of system support for such. Scenario-building for partnerships and digital ecosystems. ▪ Familiarizing both own organization and customers with the concept of servitization. Investigating business model implications of current and future digital initiatives. <p>Digital drivers: responsibility of driving the digital agenda is decentralized to business unit level</p> <ul style="list-style-type: none"> ▪ Increased revenue, new business opportunities, and strengthened core values. ▪ Efficiency gains and leaner operations. ▪ Customer expectations and competitive aspects. <p>Digital challenges:</p> <ul style="list-style-type: none"> ▪ Getting out of digital debt. Change management. Business model reinvention. ▪ Strategic alignment and coordination of efforts. Not rush digital initiatives. ▪ Grasping and meeting customer expectations. Shift in mindset.

Note: The three bullets under each area represents the value proposition, infrastructure and processes, and customer engagement, respectively.

Company B utilizes digital assessments and benchmarking to avoid stumbling around blindfolded or overestimating its digital state. Company A on the other hand is self-proclaimed digitally mature – whether this is true could be further investigated. As the focus has been different for Company A and B, digital advancements have been made in different areas. Company A has strong infrastructure and processes but lacks

digital customer engagement. Company B has strong customer engagement but lacks the enabling infrastructure and processes. The operational backbone should be the primary priority, as it enables a digitally extended and servitized value proposition, and its deliverance.

Company A has a deliberate digital strategy with clear and defined central ownership through a CDO, and a governance model. Company B operates on the opposite side of the spectrum, with an absent digital strategy, lacking directives from top management, and decentralized responsibility and ownership to business unit level. These insufficiencies are likely to explain why Company B is in digital debt – lacking a sufficiently structured approach seems to result in scattered and misaligned efforts. Both case companies want to go from solely physical products towards a servitized business model, with connectivity and traceability being the key enablers. Company A and Company B are both technologically confident, but uncertain of the corresponding business aspects. Intuitively, manufacturing companies have extensive mechanical expertise, but digital servitization is perceived as a novelty. It is critical to get the organization onboard on realizing that becoming digital is not about moving away from making world class products, but rather to complement the products by placing digital services on top. This is a key digital challenge. Moreover, digital drivers and digital challenges seem to be similar for both case companies, and perhaps for all traditional manufacturing companies.

Conclusion

The Exploring Digital Framework has multiple areas of applicability, for both academia and practitioners.

- It reveals new research opportunities based on further use

and increases the understanding of the digital phenomenon from a business perspective.

- It could be used for educational purposes, for example to solve cases or facilitate discussions within university courses in, or in close perimeter to, digital strategy and digital transformation.
- With a digital strategy already in place, it could further facilitate strategic alignment, coordination of efforts, focus and prioritization.
- Without a digital strategy in place, it could be used in initial discussions when building a digital strategy, or when exploring scenarios for one.
- It could assist practitioners when performing high-level digital assessments.
- It could facilitate transformative pacing, or in other words counteract both digital impatience and digital paralysis.

The Exploring Digital Framework is a digital roadmap used for exploring, navigating, and structuring digital – a tool for the emerging role of the CDO.

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