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DYNAMIC CAPABILITY BUILDING IN THE LEGO GROUP – PROSPECTIVE ACTIVITIES VS. REFLECTIVE LEARNING IN PREPARATION FOR A TURBULENT DIGITAL FUTURE

Research paper

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Abstract

The competitive pressures arising from digitalization increasingly favour companies that are able to respond to market opportunities by reconfiguring and integrating digitally-enabled business capabilities. The corresponding organizational challenge to integrate technological as well as managerial knowledge from distinct sources has previously been addressed by the dynamic capabilities framework, which has received major attention in strategic management research during the past decades. Nevertheless, relatively little is known about the intentional creation of dynamic capabilities in preparation for future use. To this end, this paper reports on the digitalization journey of the LEGO Group to investigate the development of its Enterprise Architecture capability. The theoretical analysis approaches Enterprise Architecture as a meta-competence to focus on dynamic capability building. The theoretical model unveils how capability quality and performance are shaped by prospective activities and reflective learning from capability use as well as accumulated experience. Furthermore, the findings position Enterprise Architecture into the theoretical context of strategic management and emphasize the discipline’s orchestrating role for continuous transformation in the digital age.

Keywords: Dynamic Capabilities, Capability Building, Enterprise Architecture.

1 Introduction

The permeation of society with digital technologies has been on-going for a while now and the technology wave is not only accelerating, but also changing in nature. While information technology (IT) has traditionally occupied a supporting role for organizations, new business models emerge that have digital components inseparably inscribed into their value proposition (El Sawy, 2003). The economic shift towards this paradigm is commonly referred to as “digitalization” (El Sawy et al., 2016, p.2).

Companies that are able to capture the moment can seize opportunities from new ways of doing business, but the disruptive forces of digitalized business models also pose enormous threats on incumbent firms. Particularly traditional manufacturing industries are facing the danger of having well-established business models disrupted by digitally enabled or infused products from the network economy. Incumbents are therefore embarking on strategic digital transformations to inject digital technology into their physical products, gain agility to develop new products as well as services quickly, and leverage business ecosystems of digital partners for value co-creation (Matt, Hess and Benlian, 2015).

Particularly under the circumstances of this “next-generation competition” (Teece, 2012), specific relevance is attributed to the dynamic capabilities framework, which claims that the long-term profitability of companies hinges on their ability to adapt internal resources and capabilities to changing customer demands and technological opportunities (Teece, 2007). As game-changing innovation increasingly emerges in the digital space, while technology lifecycles shorten and technology transfer increasingly occurs across enterprise boundaries (Teece, 2014), competitive advantage will be difficult to sus-
tain. Consequently, temporary and transient competitive advantage will be created through the development of innovative digital value offerings (El Sawy et al., 2016) and the capacity for continuous adaptation of technology-enabled business capabilities to a company’s external environment will determine success or failure for enterprises in the long run (Teece, 2012; Karimi and Walter, 2015).

In contrast to most ordinary operational capabilities, dynamic capabilities are firm-specific, cannot be bought from the outside (Teece 2014), and are “difficult to develop and deploy” (Teece 2007, p.1319). While the strategic management literature is rich in contributions on the mechanisms and effects of dynamic capabilities, the development of such capabilities has only been addressed in few individual research contributions. Agarwal and Selen (2009) demonstrate that the ability to create dynamic capabilities emerges from heavy collaboration between stakeholders, Schilke (2014) identify so-called ‘learning-to-learn routines’ as antecedents, and Zollo and Winter (2002) employ theories of organizational learning to explain capability building as a result of learning from experience. Yet, the existing theoretical knowledge base falls short of explaining the intentional creation of a dynamic capability in preparation for its future application. Filling this gap will not only add a missing piece to the explanatory puzzle, but also inform prescriptive research and practitioners embarking on the journey.

This paper therefore presents a case study on the creation of the Enterprise Architecture (EA) capability in the LEGO Group to investigate EA as a dynamic capability and shed light on the following research question: How can a company intentionally build a dynamic capability? Based on a theoretical analysis of the evidence, a mid-range variance theory is developed that unifies a reflective learning perspective from existing research with the concept of prospective, forward-looking activities.

The remainder of this paper starts with a summary of the academic literature on dynamic capabilities and EA. Then, the case evidence on the development of the LEGO Group’s EA capability is presented. The subsequent analysis focuses on its conceptualization as a dynamic capability and develops three specific research propositions. Eventually the paper closes with findings and conclusions.

2 Related Literature

2.1 Dynamic capabilities

Rooted in resource-based view, the dynamic capabilities framework seeks to explain sources of enterprise-level competitive advantage over time (Teece, 2007). Resource-based view assumes heterogeneous distribution of resource configurations among organizations (Peteraf, 1993; Hoopes, Madsen and Walker, 2003) and postulates that durable competitive advantage may emerge from valuable, rare, imperfectly imitable, and non-substitutable resources and capabilities (Barney, 1991). Even though resource-based view does not impose a static view of the world per se, critics have pointed out its deficiency to explain how heterogeneities in resource configurations emerge (Helfat and Peteraf, 2003).

Building on resource-based view, the dynamic capabilities perspective emphasizes that resource configurations among firms and market environments may change over time. Particularly in environments of rapid technological change, sustained competitive advantage relies on “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece, Pisano and Shuen, 1997, p.516). Accordingly, the framework recognizes that enterprise trajectories are shaped by path dependencies on existing resources and capabilities, but explicitly proclaims managers’ active influence through resource allocation in line with market needs and technological opportunities (Teece, 2007). Dynamic capabilities rely on entrepreneurial management that “achieves the value-enhancing orchestration of assets inside, between, and amongst enterprises and other institutions within the business ecosystem” (Teece 2014, p.27). This ‘orchestration’ capacity enables firms to innovate timely in response to technology or market opportunities (Teece, 2007).

Dynamic capabilities are a “meta-competence that transcends operational competence” (Teece, 2007). In contrast to operational capabilities, which refer to ordinary activities and techniques for making profit in the present, “a dynamic capability is one that enables a firm to alter how it currently makes its living” (Helfat and Winter, 2011, p.2). Based on the reasoning that operational best practices and in-
novations diffuse quickly in competitive environments, Teece (2014) reveals that strong operational capabilities alone will not lead to long-term success. Instead, “enterprise success depends upon the discovery and development of opportunities” (Teece 2007, p.1320). Addressing this inherent need, dynamic capabilities are conceptualized as a company’s capacity to sense as well as seize new opportunities and to continuously reconfigure or transform its assets and structures to maintain evolutionary fit with the environment (Teece, 2007). The continuous engagement in all three activities “is essential if the firm is to sustain itself as customers, competitors, and technologies change” Teece (2014, p.5).

The possession of dynamic capabilities is particularly valuable in international business environments characterized by (1) fast-pace technological change, (2) systemic innovation through combination of products and services to address customer needs, (3) open global trade, and (4) poorly developed markets for the exchange of know-how (Teece, Pisano and Shuen, 1997; Teece, 2007). As digitalization accelerates, industries are increasingly shaped by fast-pace combinatorial and distributed innovation based on digital technologies (El Sawy, 2003). This implies a need for organizations to leverage and integrate globally dispersed knowledge sources in response to market opportunities (Yoo et al., 2012). Consequently, the possession of dynamic capabilities is increasingly relevant in the digital future or what Teece (2012) calls “next-generation competition” (Karimi and Walter, 2015).

To assess the performance of dynamic capabilities, Helfat et al. (2009) introduce the notions of “technical fitness” and “evolutionary fitness” (Helfat et al., 2009, p.7). Whereas technical fitness is a measure of quality and cost, evolutionary fitness describes its bottom-line performance and contribution to competitive advantage when put to use in the organization. Consequently, “even with high technical fitness, a dynamic capability still may not lead to high firm performance in terms of evolutionary fitness” (Helfat and Peteraf, 2009, p.98). Potential causes include over-emphasis of technical fitness or low derived demand for the capability (Helfat et al., 2009).

2.1.1 Building dynamic capabilities

Despite the tremendous research attention that the framework has received in the past decades (Di Stefano, Peteraf and Verona, 2010), relatively little is known in the academic literature on how dynamic capabilities are being built in organizations. Consensus exists in the research community that dynamic capabilities are nonimitable and cannot be bought from outside the organization – i.e. they have to be built internally (Teece, 2014). More specifically, they are enterprise-specific and require “intimate knowledge of both, the enterprise and the ecosystem in which the enterprise cooperates and competes” (Teece 2007, p.28). Collis (1994) and Zollo and Winter (2002) introduce the notion of second-order dynamic capabilities that can be applied to build (first-order) dynamic capabilities. In quantitative empirical research, Agarwal and Selen (2009) elaborate constituent dynamic capabilities to support innovation in the service industry and Schilke (2014) investigate the interplay between second-order, first-order dynamic capabilities and firm performance.

Specifically Zollo and Winter (2002) build on organizational learning theories to explain how dynamic capabilities emerge from accumulation of experience in performing organizational routines and the subsequent articulation as well as codification of knowledge. Even though their foundational knowledge evolution cycle acknowledges the role of external stimuli for organizational learning, their explanatory theory implicitly portrays capability building as a result from previous experience and does not account for deliberate strategic creation of a dynamic capability. Additionally, the theory focuses on organizations as a whole, is purely conceptual and not substantiated with empirical evidence.

In contrast, Helfat and Peteraf (2003, p.1002) point out that improvements in the functioning of a capability are “not limited to learning-by-doing”. To shed light on how both, operational and dynamic capabilities, evolve in organizations, Helfat and Peteraf (2003) introduce a capability lifecycle model, which captures generic patterns of capability emergence, development, and progression. Revealing little about capability establishment or deliberate development, Helfat and Peteraf's (2003) model “provides a frame within which subsequent research can examine the processes that shape the capability lifecycle in greater detail” (Helfat and Peteraf, 2003).
Summing up, a small body of descriptive and explanatory research exists on the creation of dynamic capabilities. However, empirical evidence remains scarce and specifically the deliberate creation of dynamic capabilities is explained insufficiently to inform prescriptive research and practitioners.

### 2.2 Enterprise Architecture

EA refers to the definition and the representation of a company’s organizing logic for structures, business processes, and IT systems (Ross, Mocker and Sebastian, 2014). The purposeful (re-)design of these elements is a strategic task aiming for coherence between business capabilities and strategic goals to yield a foundation for execution of the business strategy (Ross, Weill and Robertson, 2006).

Focusing pre-eminently on technological components, EA has traditionally been conceived as interconnected layers of IT infrastructure, data, and applications (i.e. IT architecture) that enable appropriate degrees of business process integration and standardization. Following this perception, EA aligns systems as well as processes with a company's IT and business strategy to drive business value from IT (Ross, Weill and Robertson, 2006). More recently, however, practitioners and researchers from the Information Systems (IS) community start to recognize that EA is not a pure IT systems challenge and follow a more holistic view, which accounts for the dedicated business architecture. Therefore, modern conceptualizations include beyond business processes also further organizational components, such as organizational structure, people, skills, incentive systems, accountabilities, and culture (Tamm et al., 2011; Ross, Mocker and Sebastian, 2014; Mocker, Ross and Hopkins, 2015).

The implementation, and refinement of an effective EA enables companies to realize superior organizational performance (Ross, Weill and Robertson, 2006). The extent, to which companies can benefit from EA initiatives, varies and the bottom-line economic value is typically difficult to quantify. Nevertheless, consensus exists in the IS community that a high-quality EA improves organizational performance through several mediating organizational benefits, such as increased operational efficiency or strategic agility (Tamm et al., 2011; Mocker, Ross and Hopkins, 2015). Therefore, EA management, commonly abbreviated as simply EA, is often used as a vehicle for strategic digital transformations.

### 3 Research Method

The research presented in this paper adopts a positivist case study approach (Dubé and Paré, 2003; Yin, 2013) to develop an explanatory, mid-range variance theory of dynamic capability building in companies. The goal is to develop testable hypotheses about the future to elaborate how phenomena occurred and provide “an altered understanding of how things are or why they are as they are” (c.f. Type II, Gregor, 2006). Such explanatory findings may inform normative theories in the future.

To this effect, the study was designed to initially cover a broad scope based on the collection of empirical data to enable a partially inductive understanding of the capability-building process. Data collection tapped into three sources of evidence: observations, documents and interviews. Direct participant observation data (c.f. Yin, 2013) was collected by one of the authors that for 24 months acted as an integrated member of the LEGO Group’s Enterprise Architecture management team on site at the group’s headquarters in Billund, Denmark. Observations focused on the actions, decisions, and events through which the capability-building process unfolded. Observation data and information about relevant supporting material (documents), were captured in a structured diary (c.f. Naur, 1983; Baskerville and Wood-Harper, 2016). The diary entries were collected in a case database and each grouped by direct observations, reflections on observations, plans for future research, and supporting diagrams, drawings, or mind-maps. As Baskerville and Wood-Harper (2016) point out, “data validity is a problem in these techniques, partially because of the interpretive nature of the data, but also because of the intersubjectivity of data capture”. The research subjects are not only observed, but actively influenced by the researcher. To address this threat to validity, 30 semi-structured interviews (approx. 60 mins duration each) with key informants are used as a secondary source of evidence (Ritchie et al., 2013). The interviews were conducted on the company’s premises and supported by an interview guide con-
taining open-ended questions. The informants mainly include Enterprise or Solution Architects as well as senior stakeholders, such as Vice Presidents of Corporate IT. All interviews were recorded and transcribed (Yin, 2013). For further triangulation, internal documents from the company, such as presentations and architecture documentation, are used as further evidence (c.f. Yin, 2013).

We coded the data in two broad phases: The first phase aimed to capture the event time series of the EA capability. Coding categories were generic process codes (Van de Ven and Poole, 1995), including events, actions, decisions, outcomes, and states. To determine concepts and their properties in events, actions, decisions, outcomes, and states, we applied an open coding procedure. The authors jointly coded the data, identifying initial concepts and higher-level categories using a constant comparative method and resolving any disagreements through discussion (Saldana, 2009). The outcome of this coding phase was an event sequence outlining the unfolding of capability-development with an unstructured list of concepts that seemed to be relevant in the process.

The initial findings triggered a second phase of more coding as well as additional data collection targeted at the emergent concepts of importance. In the second phase, we approached the initiative as a theoretical issue of dynamic capability building. Stimulated by the LEGO Group’s engagement in forward-looking capability building activities in addition to reflective learning from doing, we turned to the relevant literatures for focal categories of coding. The main focal categories included the nature of activities and deliverables, decisions on their prioritization and evidence for the capability’s quality and performance. These categories allowed us to systematically relate the various concepts of the initiative produced in the open coding phase. The emerging themes spurred a new literature search for theoretical arguments, explaining the findings in relation to the dynamic capability literature.

Finally, we used our empirically induced findings and supportive theoretical arguments to create an initial case narrative and a timeline of activities as well as their impact on the EA capability. The narrative is supported with interview quotes for the corresponding concepts of interest to increase its vividness and transparency. Eventually, members of the initiative assessed the representativeness of the findings in our narrative (c.f. Yin, 2013). Largely, the perception concurred with our emergent explanation, revealing the need for only marginal changes to the narrative.

4 Case Evidence

As one of the first brick-and-mortar companies in the world, the LEGO Group made digitalization a fundamental pillar of the overall business strategy already in 2012. To meet present and upcoming challenges, the long-term vision for the toy manufacturer from Denmark is to create a highly adaptive organization, which collaborates closely with external partners to harness an ecosystem of platforms to co-create innovation. Since the implementation of this agenda placed heavy demands for novel functionality on the company’s enterprise systems (ES), the need for a new platform architecture became apparent to create the foundation for the company’s future digitalization journey. A Principal Enterprise Architect (EA) explains: “We have global processes, global solutions. That brings in a lot of advantages that things are integrated and tied together, but […] because of this huge, tightly integrated, tightly coupled solution, we have difficulties with reacting fast” (Principal EA, LEGO Group).

This platform architecture resulted from the fact that architectural decision-making in the LEGO Group had previously not been managed from a global perspective to focus on the long-term flexibility and evolvability of the system landscape. Over the years, the existing IT principles had largely grown obsolete and other influencing constraints, such as cost or functional requirements, have often been prioritized over architectural considerations. Therefore, design decisions were largely shaped by choices of autonomous departments prioritizing local demands. “We are moving forward very quickly in the more digital space and there were really no principles or no overlying roadmap […] [This] meant that the decisions were potentially going to be fragmented and the wrong decisions [were] taken for the long term” (Head of Engagement Technologies & Analytics (ET&A), LEGO Group).
4.1 The year 2017 - establishing the EA capability

In order to trigger the transition towards a centrally guided platform architecture, the LEGO Group established a centralized EA capability in early 2017. “When we started to talk in more details about what was needed for the future in terms of direction-setting and governance, it became clear in the leadership team that there was a need for a centralized EA function” (Head of EA, LEGO Group). Subsequently, the function was created as a small organizational unit consisting of five former Solution Architects that guide the evolution of the platform landscape with an integrated long-term perspective. Equipped with a charter of pre-defined responsibilities and deliverables, the team spent the first months after establishment refining its own playing field and future directions. This process started with defining the winning aspiration to “allow the LEGO Group to identify and realize real options by providing long-term sustainable, scalable and adaptable IT platforms that ensure that the business agenda is not limited by EA choices” (Source: the LEGO Group). Subsequently, the overarching focus areas and concrete deliverables for the first year were defined (c.f. Figure 1). “We did not start from blank paper, but [regarding] the IT direction for cloud, data and integration, it was not clear at the time I took over that we were that had settled on these in our organisation at that point in time. So that [...] influenced the prioritization within our team” (Head of EA, LEGO Group).

Against a pull from outside the team to allocate EAs primarily to advisory tasks in specific projects, the Head of EA prioritized the establishment of several fundamental artefacts and strategic directions to create a conceptual foundation of knowledge and target architectures to draw upon in future communication as well as decision-making. “I did it to protect the team, to have time for the forward-looking activities. But I think it is very unlikely that a special project will never end up in an EA team. But you really have to keep a healthy balance. And I also think you should consider where you are in your maturity journey with your EA capability” (Head of EA, LEGO Group).

Consequently, the EA team decided to not only manage and govern the platform architecture in the future, but also lead the platform direction by elaborating long-term strategies for technical integration, data management, and the adoption of cloud computing. In addition to the definition of a high-level target architecture, the strategic directions should also inform decision-making on investments into technical platforms and the establishment of complementary organizational capabilities.

4.1.1 Strategic directions for integration, cloud, and data

More concretely, the integration strategy aimed for a consistent high-level direction for the establishment of a de-coupled, service-based architecture that should integrate more traditional enterprise systems, enable IT flexibility, and spur the reuse of functionality. In order to enable automation and self-service in the provisioning of infrastructure, platform services and specific software solutions, the cloud strategy produced guidance on the selection, integration, and migration to cloud services on all layers of the stack. Eventually, the data strategy created a consistent picture of how to retrieve data from sources for analytical purposes. Even though these directions have been implemented in all new solutions, the transformation of existing landscape components has been limited so far. “The architectural community is [...] taking our principles very seriously. Therefore, they implement solutions that are in line with that. But when we modify existing solutions [...] then we are not effectively transforming them into how we want to do things in the future” (Head of EA, LEGO Group).

4.1.2 EA design principles and system landscape documentation

In addition to the development of strategic IT directions for the platform and their governance, the EA team immediately embarked on the elaboration of two specific artefacts: (1) new EA design principles and (2) the documentation of the entire system landscape. The EA design principles describe the ideal future state of the platform architecture that individual design decisions should strive towards. For instance, they prescribe decoupled integration between systems based on modern technologies and protocols. A corresponding success scorecard safeguards their implementation by evaluating individual solution designs in terms of their impact on the overall platform architecture.
The documentation of the LEGO Group’s entire system landscape, on the other hand, provides a clear picture of the as-is situation, demonstrates the complexity of the system landscape, and was initially leveraged to communicate the criticality of following a global EA direction to senior stakeholders. The Head of Technology explains: “Sometimes we all live in our small silos and we forget how much stuff we have actually put together [...] In order to get anywhere, you need to know where you are” (Head of Technology, LEGO Group). In the sequel, this landscape documentation mainly provided a basis to track the platform’s state and elaborate the transition path towards the target platform architecture.

![Focus areas 2017](image)

**Figure 1.** EA Focus Areas 2017 (Source: the LEGO Group)

### 4.1.3 Engagement with the architecture community and technology radar

Even though the three strategic directions are crucial prerequisites for shaping the platform landscape in the LEGO Group, they would remain fruitless, if not taken to life in the organization. For that purpose, the EA function’s design has been rooted in an architecture community of Solution and Application Architects that implement strategic directions in concrete architectural designs and thereby expose the EAs to some of the actual decision-making. This exposure occurred in bi-weekly architecture forums, where individual solution designs are discussed and evaluated, as well as during special projects that involve exceptional risk, high cost, fragile technology, or a strong need for change management. This has allowed the team to steadily keep strategic directions updated based on exposure to actual architectural decision-making. “We created this kind of hybrid organization with clear deliverables, some of which were actually connected into actual delivery of technology, which meant that the architects were still rooted in that and could not become too ivory tower” (Head of ET&A, LEGO Group).

Eventually, a technology radar has been created to harmonize ideas and opinions around platform risks and technology-driven business opportunities. This tool collects technology trends and risks in a central repository that enables the architecture community to create internal alignment around the maturity and applicability of specific technology innovations.

### 4.2 The year 2018 – using and continuously building the EA capability

Starting in late 2017, the Corporate IT organization in the LEGO Group embarked on an agile transformation journey, which also required the EA team to re-evaluate their value-add in the organization and articulate the responsibilities and deliverables in the form of products. While the outcome was shaped by previous focus areas, the process also entailed a realignment with the changing environment in the company (c.f. Figure 2). Defining a “Strategic Advisory” product to cater for strategic consulting activities in special circumstances, projects or assignments, the EAs did not know at this point that they would be spending most of their time in 2018 on this product. Even though the team has also been driving other initiatives, such as the company’s cloud journey and community-building, these activities are not of relevance for this study and therefore not elaborated on in this narrative.
4.2.1 ERP suite end-of-life recommendation

A large proportion of the LEGO Group’s system landscape consists of a wall-to-wall installation of a large software vendor’s enterprise suite – including enterprise resource planning (ERP). Vendor-provided maintenance of these components has been announced to expire in 2025. In the meantime, the vendor had introduced a new enterprise suite that client companies are recommended to migrate to. Although a multitude of companies across industries were facing this ‘end-of-life’ challenge in early 2018, few had embarked on the journey. In the LEGO Group, the enormous challenge ahead had not been prioritized until the Head of EA initiated investigations.

Subsequently, the EA team was dedicated for two months to investigate if the company should migrate to a new ERP solution at all, if the same vendor should be maintained for ERP, and what potential migration scenarios, if necessary, may look like. Based on a thorough analysis that contemplated all potential options, the team delivered a recommendation that was immediately approved by the Chief Information Officer (CIO). “That was sort of a determining moment for EA, that the EA team with high pace delivered this recommendation back to the CIO and even CEO. And the direction was accepted” (Head of EA, LEGO Group). During this process, the EAs did not only rely on the system landscape documentation elaborated during the previous year, but also on strategic IT directions and EA design principles that embody consensus on the architectural road ahead. “In the ERP replacement strategy as well as the technology strategy, the principles have been applied” (Principal EA, LEGO Group).

![EA Product Catalogue](image)

**Figure 2.** EA Products 2018 (Source: the LEGO Group)

4.2.2 Future platform architecture recommendation

In May 2018, the LEGO Group’s CIO, Chief Business Transformation Officer (CBTO), and Head of EA were invited by the Chief Executive Officer (CEO) to present a strategic plan for the future platform landscape. The CEO had been newly assigned in October 2017 and had previously been the CEO of a large Danish manufacturing company where he had driven the digitalization agenda and the transformation of the platform landscape. Specifically based on the artefacts elaborated in 2017 and the ERP end-of-life investigation in 2018, the EA team had an overarching picture of the as-is and to-be state of the platform architecture in place. “It was the first thing he asked for: ‘How does your current landscape look like? Where is it that you are taking off from on this transformational journey and what principles [do] you leverage to steer […] that transformation?’ And that was when we sort of handed over the principles, that we had developed, to him […] After showing these artefacts, there was no more questions basically and I do not know what we would have responded, if we could not have delivered” (Head of EA, LEGO Group).

For the specific purpose of the meeting with the CEO, the EA team used existing artefacts and knowledge to paint a picture of the envisioned future platform architecture. “We came up with both, a recommendation on what to do with the [ERP] but also with actually quite a good storyline about where our platform has brought us but also what are the pain points that we have today. [...] That has
been used as a good step up after some discussions with the CEO and the CBTO, on how can we drive this further into a [...] technology strategy” (Principal EA, LEGO Group). Based on the presented ideas, the CEO initiated a program to develop a new technology strategy that should confirm and extend the content. “The CEO also quite quickly afterwards came back and said that he wanted a new technology strategy that should embark on some of the ideas that we had, and of course we could use an external company to build this new IT or technology strategy, but he really believed that we were on the right track with our own ideas” (Head of EA, LEGO Group).

4.2.3 Technology strategy development process

Initiated in June 2018, the program was set out to deliver a technology strategy and a four-year investment roadmap that would enable the company’s commercial agenda, address critical technology pain points, drive IT-enabled business flexibility, and afford future digital innovation. From the outset on, the CEO emphasized the role of EA during the process as well as for the outcome. Subsequently, a technology vision, technology principles, and a future-state platform architecture model form the cornerstones of the outcome strategy that were largely influenced by previously developed EA artefacts.

“All of the principles that we have developed back in ’17 are very much in line with what we have come up with from a strategic point of view now. We were probably a little bit ahead of curve when developing these principles” (Head of EA, LEGO Group). Also, the strategy will implement the EA team’s recommendation addressing the ERP solution’s end-of-life.

Additionally, numerous individual workstreams assessed the current maturity-state of applications and business capabilities in individual functions to create an in-depth as-is picture of the existing architecture. Co-developing desired future ambition levels with business stakeholders, concrete initiatives were developed that will upgrade technology-enabled business capabilities over the four years following 2018. These initiatives are not limited to the replacement of existing systems, but also include active elimination of technical debt to enable future platform landscape flexibility. Simultaneously, new components will only be added in accordance with the platform architecture model and principles.

During this process, the EAs were heavily involved within individual workstreams, but foremost in the global consolidation of initiatives. A Principal EA recalls: “We helped the stream leads quite a bit in their work on the strategy [...] We worked quite intense together in those periods which [...] has been highly appreciated - the contribution that we gave them” (Principal EA, LEGO Group). Additionally, the Head of EA points out that “the EAs have educated themselves throughout the development of the new principles in ’17 and that made it much easier to co-create the direction for the future strategy [because the team was] not on a sort of learning journey” (Head of EA, LEGO Group).

The individual workstreams were not only facilitated by pre-existing EA artefacts but furthermore produced new artefacts with subsequent usefulness. On the one hand, the application maturity assessment relied on the pre-existence of the system landscape documentation. “The system landscape mapping [...] was a good stepping stone for starting the strategy work. First thing that consultants asked for when they came in is "How does your landscape look like?", similar question asked by the CEO when he entered” (Head of EA, LEGO Group). “That has helped in both our ERP strategy as a well as our technology strategy work. Because that gave us the overview on what is it that we are touching” (Principal EA, LEGO Group). On the other hand, the maturity assessments were also a valuable contribution to the EA’s toolbox for future use. “As part of the strategy [we] had to make [...] a capability maturity assessment as well as an application maturity assessment. [...] We only could get that happening due to the technology strategy in kind of a pressure cooker way” (Principal EA, LEGO Group).

The new technology strategy was approved along with a significant dedicated investment budget by the LEGO Group’s executive leadership team as well as the board of directors in October 2018. Accordingly, the EA team will shift focus from strategy-making towards an orchestration role during implementation. Even though the strategy will be subject to continuous refinements as the execution progresses, the EA team will spend significantly more time on advisory and implementation tasks than strategy-making. “With respect to the principles, scorecard but also the landscape work and this ERP replacement strategy work, [...] we showed that we know what we are doing and that we have a cer-
tain experience, knowledge, maturity in the organisation [...] and also that to some extent we deserve a seat at the table. They reached out more than ever before for us now” (Principal EA, LEGO Group).

5 Analysis

Unifying the existing academic literature on dynamic capabilities with an analysis of the presented case evidence, this section first conceptualizes EA as a dynamic capability and subsequently develops an explanatory, mid-range variance theory of deliberate dynamic capability building in organizations.

5.1 EA as a dynamic capability

EA entails the purposeful (re)design of a company’s foundation for execution to align not only business processes and IT systems, but also structures, roles, and incentive systems with the overall business strategy (Ross, Weill and Robertson, 2006; Ross et al., 2016). Ever since the emergence of enterprise systems, but particularly in the age of digitalization, this foundation for execution encapsulates a growing proportion of a company’s operational capabilities to either support value propositions or automate them to a full extent (El Sawy, 2003; Ross, Weill and Robertson, 2006). The design, integration, and orchestration of IT, business processes, and value propositions therefore leverages technological opportunities to develop or support business capabilities in response to market opportunities. This usually requires the integration of IT and business knowledge from dispersed sources within and outside the organization, but eventually leads to superior long-term performance (Ross, Weill and Robertson, 2006; Tamm et al., 2011).

In the LEGO Group, the EA capability entails specific mechanisms that support the sensing as well as seizing of technological and market opportunities and particularly the continuous transformation of technology-enabled business capabilities. Whereas the technology radar and the engagement with selected technology-driven business initiatives primarily focus on the identification and realization of opportunities, the orchestration of technology strategy implementation (including technology principles, future state architecture, and EA design principles) serves the continuous transformation of technology-enabled business capabilities. At the same time, this transformation primarily seeks to enable the seizing of opportunities by creating digital options for digital innovation and the company’s commercial agenda in the future. This continuous engagement in sensing and seizing of opportunities, while simultaneously transforming the platform landscape, addresses a long-term perspective of steady digital transformation to reconfigure value propositions in the face of next-generation competition (Teece, 2012; Matt, Hess and Benlian, 2015).

In sum, the LEGO Group’s EA capability is a specific dynamic capability, which aims for the purposeful reconfiguration of existing IT-based business capabilities through continuous engagement in sensing, seizing, and continuous transformation.

5.2 Capability building

In order to theoretically analyse dynamic capability building, this paper follows Helfat et al.’s (2009) reasoning that a dynamic capability’s contribution to company performance (i.e. its evolutionary fitness) is shaped not only by its technical fitness, but also by market demand and competition dynamics. In other words, the more demand calls for the use of a technically fit dynamic capability, the higher its evolutionary fitness is going to be. Subsequently, technical fitness – defined as “how effectively a capability performs its intended function when normalized (divided) by its cost” – and evolutionary fitness - “how well a dynamic capability enables an organization to make a living by creating, extending, or modifying its resource base” (Helfat et al., 2009, p.7) – are adopted as dependent variables for this study. Zollo and Winter (2002), on the other hand, theorize that experience accumulation through capability use leads to capability improvement – implying an increase in the capability’s technical fitness. This effect may be amplified by deliberate investments into reflective learning activities, which refer to a “deliberate process through which individuals and groups figure out what works and what doesn’t in the execution of a certain organisational task” and “the codification of knowledge derived
from reflection upon past experiences” (Zollo & Winter, 2002, p.340f). Based on this reasoning, proposition one rephrases what is already known from previous research contributions:

**P1:** The technical fitness of a dynamic capability increases through capability use, resultant experience accumulation, and reflective learning activities.

In the LEGO Group, this effect was observable as improvements in the EA capability’s technical fitness resulting from exposure to individual design decisions in the architecture forum, advisory to special projects as well as initiatives, and the orchestration role in the technology strategy development process. Since these activities had the purpose of delivering the capability’s eventual value, they are conceptualized as capability use in this study. During technology strategy development, for instance, the EA capability was used to deliver initial artefacts and orchestrate findings as well as initiatives across streams. Based on the resultant experience, the EAs did not only improve their knowledge specific to individual tasks, but also yielded valuable artefacts, such as the application maturity assessment, refined strategic IT directions or updated principles. This process eventually improved the technical fitness of the capability as a whole.

While the mechanism described in proposition one is backward-looking and reflects Zollo and Winter's (2002) theory on organizational learning through experience accumulation, the case evidence furthermore exposes how the EA function embarked on prospective capability building activities that were not preceded by capability use. These activities included the development of strategic IT directions for cloud, data, as well as integration, the EA design principles, and the system landscape documentation. Also, the initial elaboration of the EA winning aspiration, focus areas and deliverables are evidence of prospective activities for an unknown future. The engagement did not deliver the value associated with the EA capability to the rest of the organization but served the unique purpose of increasing its technical fitness for future use. Specifically, the development of strategic IT directions was conducted due to anticipation of future demands instead of current necessity.

![Figure 3. Illustration of the Research Model in the Context of Previous Research](image)

This study’s emergent conceptualization of prospective capability building activities therefore includes, but is not limited to, external knowledge acquisition, strategic recruitment, strategic planning, or generic problem-solving on a conceptual level to derive normative guidance and guide future decision-making for action. These activities may also entail what Zollo and Winter (2002) term knowledge codification and articulation. The development of EA design principles in the LEGO Group, for instance, did involve knowledge codification but foremost created new knowledge in the organization through conceptual problem solving and the operationalization of strategic IT directions. Most importantly, prospective activities are not triggered by capability use and experience accumulation but
refer to forward-looking capability building. Subsequently, this inductive reasoning justifies proposition two:

**P2:** The technical fitness of a dynamic capability increases through prospective capability building activities that do not contribute to the immediate delivery of its value.

Combining propositions one and two reveals a strategic choice that organizational units face when investing deliberately into the creation or improvement of a dynamic capability: the allocation of time and resources between (a) prospective activities, on the one hand, which will increase its technical fitness for future application and (b) immediate capability use, on the other hand, to deliver its value while also collecting experience to feed reflective learning.

In the LEGO Group, this tension materialized particularly in the year of the EA capability’s establishment as the team has continuously been pulled into special projects for advisory purposes by senior stakeholders to deliver immediate value. The Head of EA deliberately opposed this pull and ensured the allocation resources to the elaboration of strategic IT directions and EA artefacts. This prioritization turned out to be particularly expedient as the resultant artefacts and knowledge have been in high demand during the subsequent year. Prospective capability building did therefore not only contribute majorly to the capability’s technical fitness, but through mediation also to its evolutionary fitness. The tension specifically results from the capability’s nature as a meta-competence as well as the complexity of its output value. Based on this theoretical argument, the challenge does not seem to be a phenomenon specific to the development of an EA capability in the LEGO Group, but may also emerge in the context of other organizations and meta-competences. This reasoning justifies proposition three:

**P3:** The strategic creation of a dynamic capability comprises an inherent tension between prospective capability building activities and delivery of value through capability use.

6 Discussion and Conclusion

The case evidence and theoretical analysis reveal that a dynamic capability can be built not only through capability use as well as reflective learning, but also through deliberate forward-looking activities. While previous research contributions mainly focus on organizational learning from previous experience, this study contributes and emphasizes prospective activities to position a dynamic capability for current as well as anticipated future demand. Propositions one and two accordingly form a mid-range variance theory, which explains that the technical fitness of a dynamic capability increases not only through reflective learning from capability use and resultant experience accumulation, but also through prospective capability building activities. Figure 3 harmonizes these findings in a consistent picture with the findings of previous research. Since reflective learning activities rely on – and amplify the effect of - previous experience accumulation, the concept is depicted as a moderating variable.

Furthermore, proposition three postulates that these two modes of investing into the technical fitness of a dynamic capability lead to an inherent tension between prospective activities and reflective learning from capability use during creation or enhancement. This tension between “building capabilities for the future while ensuring success in the present” (Smith and Lewis, 2011, p.4) is a well-known phenomenon from the literature on organizational ambidexterity and has been studied at various organizational levels (O’Reilly and Tushman, 2013). Smith and Lewis (2011, p.12) emphasize the importance of awareness as well as acceptance of such tensions and suggest resolution “either through splitting and choosing between tensions or by finding synergies that accommodate opposing poles”.

Prospective capability building activities entail conceptual problem solving and external knowledge acquisition, but may also include the codification of conceptual knowledge that did not result from previous experience. This methodological overlap with reflective, experience-based learning activities may offer potential for synergistic integration. Nevertheless, this study explicitly emphasises the split between the two opposing poles. This finding stresses the role of entrepreneurial managers that create
awareness of the tension, anticipate future demands on a dynamic capability, and ensure long-term technical and evolutionary fitness by prioritizing corresponding prospective activities.

Reporting on the creation of an EA capability, the case evidence covers a discipline that has received tremendous attention in practitioner circles but has suffered from a shortage of theoretical considerations in academia. By conceptualizing EA as a dynamic capability, this study places the discipline into the theoretical context of strategic management. As industries are increasingly shaped by digitalization and hyper-competition, the long-term, holistic management of technology layers and business architecture will continuously gain importance in enabling business flexibility. Therefore, the EA capability will be a central element for explaining and prescribing how companies adapt their resources and capabilities to changing customer demands and opportunities in quest for competitive advantage.

6.1 Implications for practice

This study produces two implications particularly relevant for practitioners. For once, the theoretical model provides concrete guidance to managers embarking on the journey in terms of which types of activities to invest resources into when deliberately creating a dynamic capability. Particularly in preparation for a vague future, the anticipation of future demand on the capability and identification of appropriate prospective activities may be vital to ensure long-term technical and evolutionary fitness.

Secondly, the study stresses the tension between prospective activities and reflective learning based on capability use that practitioners should be in awareness and acceptance of. Even though this implication may seem trivial, a successful balance between capability building and capability use relies on the exploration of synergies between the two, the identification of stakeholder demands, and a clear prioritization of deliverables to satisfy outside requirements while also prioritizing long-term interests.

6.2 Limitations and validity threats

Naturally, the research presented in this paper is subject to several limitations. First, the evidence and analysis investigate the development of a specific capability in one organization to derive findings on the wider class of dynamic capabilities. Although the generalization is supported by theoretical arguments, more evidence is needed from a wider population of companies and distinct types of dynamic capabilities to warrant external validity of the findings. Secondly, the quality and performance measures adopted for dynamic capabilities – technical and evolutionary fitness – are highly conceptual and difficult to quantify. Even though the case evidence clearly indicates an increase in the EA capability’s quality and performance, these measures are admittedly vague and reliant on stakeholder opinions. Nevertheless, the focus of this study lies on decisions, actions, and activities involved in capability-building instead of its precise performance measures. Furthermore, the bottom-line business value of the function is highly conceptual and will only emerge long-term. Even though the threats to validity have been addressed during the research process, especially key informant bias remains a concern.

6.3 Conclusion

Complementing previous research that portraits dynamic capability building as learning from experience, this study makes a theoretical contribution by revealing how a meta-competence can be built strategically from scratch. Based on the existing literature and an in-depth case study on the creation of the EA capability in the LEGO Group, a mid-range variance theory is developed that equally extends our theoretical understanding of dynamic capabilities and provides guidance to practitioners.

References


