Information & Management 57 (2020) 103262

Contents lists available at ScienceDirect

Information & Management

journal homepage: www.elsevier.com/locate/im

Strategy archetypes for digital transformation: Defining meta objectives using business process management

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ARTICLE INFO

Keywords:
Digital transformation
Business process management
Interview study
Meta objective
Strategy archetype

ABSTRACT

Digital transformation dominates the practical and scientific discourse. Still, many companies do not have a clear plan on how to approach it. Particularly, small- and medium-sized enterprises struggle to initiate their digital journey as they lack resources and expertise. In response, we examine how five companies use business process management (BPM) to implement digital transformation. We perform a qualitative interview study, and analyze the capabilities of BPM based on six requirements of digital transformation. Thereby, we carve out 17 recommendations, which must be adapted according to companies' meta objectives. We derive three strategy archetypes to serve as implementation blueprints.

1. Approaching digital transformation

Digital transformation changes societies and industries, and is fueled by the convergence of social, mobile, cloud, and smart technologies as well as the growing need for automation and integration [1,2]. Despite new opportunities for product and service innovation, it is frequently perceived as a threat to traditional business models, current organizational structures, and well-established business operations [3–5]. As more and more companies encounter corresponding challenges, they have put digital transformation to the top of their priority lists [6].

However, most companies only have a diffuse understanding about the nature and impact of digital transformation [7]. Consequently, they struggle to design and implement actionable strategies successfully [8,9].

This applies especially to small- and medium-sized enterprises (SME), whose ability to change is naturally limited. In 2017, many European SMEs still lacked an organizational initiative for digital transformation and were referred to as nondigital [10]. Seeking to learn from large companies, SMEs are typically overwhelmed by the broadness of opportunities and challenges offered by digital technology. In particular, they fail to transform the implications to a suitable scale, as the priorities of large companies are too manifold to derive practical and actionable recommendations (cf. e.g., [11]).

In this article, we report on how the large companies, such as the Lego Group (LEGO),[1] SAP SE (SAP),[2] Allianz Global Corporate and Specialty SE (AGCS),[3] and 1&1[4] as well as Taifun-Tofu GmbH (Taifun)[5], prepare for and navigate digital transformation projects. Besides establishing flexible organizational structures, they achieve adequate responsiveness on operational and strategic levels, and use customer centricity and process orientation to shape their digital futures. All companies consider business process management (BPM) as a baseline for digital transformation. They represent different industries, and thus, help to paint a broad picture of the situation.

On the basis of prior research, we first introduce six requirements, which need to be addressed for successful digital transformation. We

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[1] LEGO is a privately held company based in Denmark, manufacturing plastic construction toys.

[2] SAP is a Germany-based multinational software corporation that develops and distributes enterprise software to manage business procedures and customer relations.

[3] AGCS is a subsidiary of the German financial services company Allianz SE, and is the dedicated carrier for corporate and specialty insurance business.

[4] 1&1 is a brand of United Internet AG that offers broadband and mobile access products for private and commercial customers as well as hosting cloud and e-business applications for home users and small companies.

[5] Taifun is a German company that specializes in the production and distribution of natural and vegan food products. Until 2017, the company was known as Life Food GmbH/Taifun-Tofuprodukte.

https://doi.org/10.1016/j.im.2019.103262
Received 18 May 2018; Received in revised form 17 December 2019; Accepted 21 December 2019
Available online 07 January 2020

map them to BPM capabilities at our case companies by introducing the established Six Core Elements of the BPM framework [12]. In the following, we report on the findings of our interview study, and use the results to define recommendations for all requirements. We use contextual configuration options for some of these recommendations to flesh out three profiles, representing meta objectives of digital transformation. Ultimately, we derive three strategy archetypes, which can aid companies to position and plan their digitalization efforts better based on their objective.

2. Understanding the relationship between BPM and digital transformation

2.1. From digitization to digital transformation

Although often used interchangeably, *digitization*, *digitalization,* and *digital transformation* account for interdependent but different phenomena. *Digitization* describes the transformation of information into a digital representation [13]. As digitization has enabled greater information accessibility and created new opportunities for communication, it has yielded the emergence of the *digitalization* paradigm, which has made information technology (IT) pivotal for competitiveness and customer satisfaction [14]. As a result, companies have increasingly relied on aligning their structures, operations, and strategies with IT to realize various benefits, including improvements in costs, performance, and product and service quality [15–17]. Although this has required companies to sustainably adapt their organizational structures and operations, the impact of digitalization has been limited mostly to controlled business scenarios [18]. However, as digital technologies connect people, things, and locations to generate and analyze large amounts of data, digitization and digitalization merge to become *digital transformation* [13], which alters communication and interactions between all stakeholders and reshapes the current economic, social, and political landscape [2,19,20].

2.2. Requirements for digital transformation

While companies can manage aspects of digitization and digitalization primarily by using information systems, they need to rely on holistic approaches when coping with digital transformation [21]. As research and practice still lack a clear understanding about its scope and nature [5,22], we analyzed 19 practice-oriented studies to identify a consolidated set of requirements for companies that seek to manage digital transformation successfully. In Table 1, we provide a short description for each requirement. Appendix A contains a full list of the references and their coding. Cf. also [23] for further details.

Following Table 1, companies must simultaneously address digital transformation in multiple dimensions, including their strategies, organizational structures, operations, and culture.

2.3. Capabilities for successful initiatives using BPM

Digital transformation generally leads to changes in procedures and organizational structures. BPM can be regarded as the “art and science of overseeing how work is performed in an organization, to ensure consistent outcomes and to take advantage of improvement opportunities” [24].

By creating a baseline for communication, BPM can not only enable the realization of optimization potentials, but also foster process innovation and creativity. Ultimately, BPM provides an overview of organizational resources and competencies, and assigns them to tasks and activities within the company’s value creation processes.

In the following, we use established knowledge from the BPM domain, namely the *Six Core Elements of BPM* framework [12], as a lens to analyze the above requirements. Cf. Fig. 1 for an overview of the capability areas.

The framework builds upon the six dimensions *strategic alignment, governance, methods, IT, people,* and *culture.* In general, *strategic alignment* suggests that companies must align BPM to their overall strategy. Hence, they are required to connect their organizational priorities and processes constantly, to realize continuous performance improvements. *Governance* demands a system of roles and responsibilities to ensure transparency and accountability. Furthermore, companies rely on effective decision-making mechanisms and reward systems that support and facilitate process-related actions. With regard to *methods*, they must provide tools and techniques to enable the various BPM activities performed within their organization. Companies further rely on *IT* for process analysis, process modeling, and process execution. *People* create, enhance, adopt, or refuse organizational change, and are thereby essential for successful BPM. To access and use their process knowledge and expertise, companies must provide them with adequate incentives and account for individual preferences, needs, and requirements [25]. Ultimately, *culture* requires them to establish collective values and beliefs toward a process-centered organization. Hence, successful BPM initiatives rely on a process-oriented environment that fosters communication and collaboration.

3. Methodology and case companies

SMEs, in particular, can be overwhelmed by the opportunities and challenges of digital transformation, and experience problems deriving clear recommendations for action to guide their digital journeys [23]. To overcome this, we analyzed how several large companies initiated digital transformation successfully.

We performed a qualitative analysis based on semi-structured interviews with domain experts [26]. Expert interviews are a naturalistic method to validate theoretical artifacts in real environments and organizational contexts [27].

We have selected AGCS, LEGO, 1&1, SAP, and Taifun as case companies. Each company is unique in regard to industry, size, and business focus. In summary, they represent a variety of voices. Thus, we can review digital transformation in different environmental settings. Table 2 summarizes the key characteristics of the companies.

Data collection involved a series of in-depth interviews conducted in 2017 and 2018 using a multiple informants design, which allowed us to gather information from different individuals or sources, and thus, to adequately assess the current status quo [28]. Using semi-structured questions, we first asked background questions about the current position and work experience. None of the companies or interviewees have a formal relationship with the researchers. There had been prior informal contact with 1&1. While all interviewees are experts in the domain of BPM and involved in digital transformation projects of their company, they have different backgrounds and positions within their respective companies. All interviews were performed by two research assistants on the phone and averaged 90 min (range, 81–98 min). If there was not enough time to go through all content in one phone call or if there were further inquiries, a second call was scheduled. The interviews were transcribed and comprised an average of 4498 words. We used a two-step coding and analysis process. First, to mitigate bias, one author coded the data into themes. Our second step of analysis involved summarizing the data for each theme across all cases. The intent in this second round was to help detect patterns in the evidence related to each construct across organizations. We have validated our findings with all interviewees, and they confirmed our observations regarding meta objectives and strategy archetypes.

Our qualitative approach naturally limits the number of data points over those as a result of a broader quantitative study. Hence, we draw conclusions from fewer cases. Contrariwise, our approach enables us to delve into topics in greater detail, and also to revisit and confirm derivations with the interviewees.

This approach permitted a rigorous, cross-organization examination of five instances of digital transformation projects using BPM in

Table 1
Requirements for Digital Transformation.

Requirement	Description	Source
Digital Strategy	To approach digital transformation, companies must formulate a digital strategy that determines goals and actions, but also considers governance and compliance.	17 of 19 references[1]
Agility	Due to a dynamic environment, companies rely on flexible, adaptable, and responsive organizational structures with adequate management support.	9 of 19 references[2]
Digital Expertise	As tasks become more complex, companies must establish new IT-related skills and foster specialization.	11 of 19 references[3]
IT Innovation	Companies must continuously align their business structures with new technologies to benefit from standardization and automation.	13 of 19 references[4]
Collaboration	Companies must ready their organizational processes for the use of technology to connect and collaborate with internal and external stakeholders.	13 of 19 references[5]
Openness	To ensure the transformation's sustainability, companies rely on an open-minded culture that facilitates creativity and risk-taking.	12 of 19 references[6]

[1] Most authors claim a profound digital strategy to be essential for digital transformation. A total of 17 references were published in outlets such as *MIS Quarterly, Journal of Management Information Systems (JMIS)*, and *Business & Information Systems Engineering (BISE)*. The references include Mithas, et al. [14] and Karimi and Walter [3].

[2] The references demanding increased organizational agility in digitally transformed environments were published in outlets like *MIS Quarterly Executive* and *MIS Quarterly*. They include [18] and Hansen and Sia [19].

[3] The references about digital expertise were primarily published in outlets, such as *MIS Quarterly Executive*. They include Dremel, et al. [16] and Hess, et al. [20].

[4] Among the identified studies, IT, and especially its alignment with digital strategies, is one of the key success factors. We identified a total of 13 references that were published in outlets like *MIS Quarterly* and *BISE*. These include Matt, et al. [7] and Drnevich and Croson [22].

[5] Following research papers in outlets, such as *MIS Quarterly* and *BISE*, the collaboration of key stakeholders is an essential prerequisite for digital transformation. The references include Bharadwaj, et al. [5] and Maedche [21].

[6] Additionally, businesses require an openness in its corporate culture that is aware of the corporate strategy for digital transformation. We identified a total of 12 relevant references that were published in outlets, such as *MIS Quarterly Executive*. The references include Singh and Hess [6] and Hansen, et al. [15].

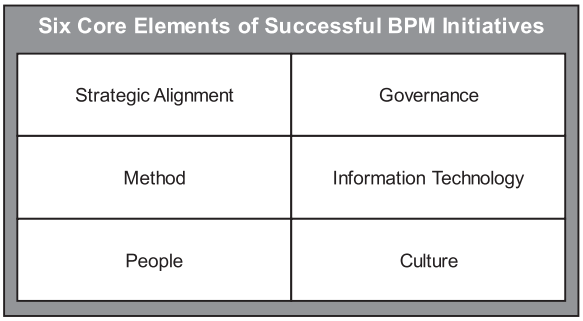

Fig. 1. Six Core Elements of BPM Framework.

Europe,[6] but leaves unanswered questions of how processes unfold around different kinds of economic environments, such as the U.S. or Asia. We expect that the model will hold for a range of similar issues in a comparable context, but ultimately its applicability remains to be tested.

4. Successful digital transformation with BPM

4.1. On the relation of BPM and digital transformation

Research and practice have highlighted the role of BPM as a preliminary stage of digital transformation because both share similar goals and characteristics [23,29]. In the following, we use the dimensions of the Six Core Elements of BPM framework (cf. Fig. 1) to structure our discussion of the case companies, and explain how they tackled the six requirements of digital transformation (cf. Table 1) using BPM. Marcus Eckhardt, manager for business excellence at AGCS, explains the relation of BPM for digital transformation in the following way:

"If you break down digital transformation into a set of smaller objectives and action plans, most of them involve automation in different parts of the organization. This is why we foster a 'processes first' policy, which views the outcomes of BPM as a requirement for digital transformation."

This relationship stems mostly from the capability of BPM to directly or indirectly address the requirements of Table 1. For example, 1&1 uses BPM to build digital expertise as the company needs to ensure low time-to-market cycles in an increasingly dynamic market environment. Driven by standardization and automation, their business structure enables the efficient implementation and execution of its core activities. However, 1&1 quickly realized that embarking digital transformation is not only subject to technology and its affordances, but is also strongly contingent on employee's commitment. Against this background, 1&1 leverages BPM to promote a technically driven communication that allows for fast and effective exchange of information and knowledge. While their approach matured and flourished over years, cross-functional communication and collaboration has become a natural part of their daily business and facilitates the uncovering weak ties and tacit knowledge within the company's complex organizational structure. At AGCS, corresponding activities provide the means to ensure an operational backbone that yields high responsiveness, reliable process outcomes, and customer satisfaction.

The companies in our study faced several concrete practical challenges when introducing and managing BPM in their organization, to meet the requirements of digital transformation systematically. They used BPM primarily to reduce costs and to increase customer orientation, transparency, and product and service quality. However, as digital transformation demands the realization of socio-technical assets, and BPM yields adaptations to their social, technological, and operational setup, each company developed an individual strategy to manage the underlying change processes successfully. To account for market dynamics and varying organizational needs, companies perform BPM as a sequence of interconnected initiatives that differ in regard to scope, structure, and goals. Troels Hoffmann,[7] LEGO, explains this in the following way:

"BPM is neither a one-off nor a static project. It is affected by numerous influence factors that imply constant change and adaptations. Therefore,

[6] Some of the companies surveyed are global players with business activities that span far beyond the borders of the European Union. Established and proven in their local markets, the global adaptation of local expertise often proves to be equally effective. At AGCS, for example, BPM services are offered on a global basis without the need of the seconded experts to significantly change their methods or practices to be successful.

[7] While Troels Hofmann was employed as senior business process consultant at LEGO at the time of the interview, he left the company in 2018.

Table 2
Characteristics of the Case Companies.

	AGCS	LEGO	1&1	SAP	Taifun
Industry	Financial Services	Manufacturing	Internet Services	Software	Food
Number of Employees	~ 4400	~ 19,000	~ 9100	~ 99,000	~ 260
Legacy Form	Societas Europaea (SE)	Private	Societas Europaea (SE)	Societas Europaea (SE)	GmbH (private)
Focus Areas	Corporate insurance, specialty insurance, alternative risk transfer, risk consulting, and claims management	LEGO bricks, construction toys, educational concepts, consumer experiences, and digital play experiences	Broadband connections, mobile internet, telecommunications solutions, webhosting, cloud applications, and e-business solutions	ERP, financials, business intelligence, procurement, HCM, SCM, business, planning, analytics, and reporting	Organic food producer; vegan convenience products
Position of Interviewee	Manager for business excellence	Senior process consultant	Expert BPM	Digital transformation officer	Manager quality management & IT

we continuously reuse the outcomes of BPM to improve our organizational performance. Sometimes we achieve an objective and the next day we start all over again."

Despite differences, each of the case companies deployed BPM successfully and used the outcomes to initiate and support their digital transformation projects.

4.2. Strategic alignment and governance

The importance of *strategic alignment* and *governance,* to establish a digital strategy and to ensure agility, collaboration, and digital expertise was cited consistently across all companies in our study. Actions taken to align BPM to the demands of digital transformation ranged from determining clear project goals to ensuring top management support. To establish training programs, the companies further highlight the importance of harmonizing BPM with other organizational initiatives, and provide process architectures to structure and coordinate corresponding activities. Each company defines rules and responsibilities to govern their projects. At 1&1, BPM draws primarily upon the assumption that there are many different objectives to be maintained by BPM, and that every employee has valuable knowledge that can contribute to the improvement of the company's processes and operations. Martin Petry, 1&1, clarifies:

"We believe that BPM as a whole and process modeling in particular are relevant for each member of our organization. Conducting everyday business, our employees continuously evaluate and refine their work routines and procedures to meet personal and organizational expectations."

He further points out:

"To make use of that ever-changing implicit knowledge, it is central to the success of a BPM initiative that it is for everybody at all times. We provide each employee willing to participate with the opportunity to document and analyze her or his procedures individually and, thus, to become an active part of the overall initiative. Or in other words: Every employee is a potential modeler."

As a result, 1&1 does not focus exclusively on process redesign and improvement, as this would require a more structured and systematic approach to BPM. Instead, it deploys BPM as part of a larger initiative for continuous business improvement and seeks to accomplish operational quality, customer orientation, and digital transformation by facilitating collaboration and communication among its stakeholders. Hence, 1&1 managed to implement a self-regulated and self-organized initiative that primarily builds upon the technique of process modeling to formalize skills, technologies, and documents necessary for process execution, and to facilitate knowledge management and a common business understanding. BPM's operational backbone is reflected by a multi-tiered process architecture that connects and organizes corporate processes. With comprehensive documentations and an interconnected system of process-aware employees, 1&1 was able to design a holistic digital strategy and identify the most promising projects that pave the way toward digital transformation. Furthermore, the company does not actively check and/ or enforce rules, guidelines, and responsibilities. It rather assumes distributed and continuous optimization efforts by the users of the corresponding process models, as Petry's following quote emphasizes:

"Promoting BPM at 1&1 in its various business contexts, we have always been aware that governance is only efficient when implemented locally and not at company-level. In the latter case, this would rather obstruct and choke the whole approach's dynamics, as departments usually have quite individual objectives and perspectives that evolve and change over time."

Table 3
Overview Strategic Alignment and Governance.

	AGCS	LEGO	1&1	SAP	Taifun
Top Management Support	High	Medium	Low	High	High
Implementation	Hybrid	Hybrid	Distributed	Hybrid	Central
Hierarchy	Functional	Functional	Organizational Circle	Divisional	Functional
(Hierarchy) Governance Control					
	Top-down	*Top-down*	*Bottom-Up*	*Hybrid*	*Top-down*
Governance Approach	Restrictive	Advising	Guiding	Restrictive	Restrictive

At the beginning, LEGO's primary aim was to improve communication. However, once the overall process maturity increased, the company began to shift its focus toward process unification and optimization to realize performance improvements. LEGO performs BPM as a hybrid initiative, in which distributed and process-aware employees actively analyze processes for inconsistencies and/or improvement potentials during process execution. The company further established a center of excellence to support those distributed efforts. This entails that educated process analysts constantly monitor the quality of BPM outcomes and decide whether a particular process should be included in the central process map or not. LEGO has launched multiple improvement projects over the years. While some employees shared common goals and resources similar to those of the company's BPM, others pointed toward different or even opposing directions. Hence, LEGO relies on continuously aligning those projects to accomplish holistic performance improvements. Troels Hoffmann explains:

> *"In a company with a focus on customer satisfaction, opportunities for improvement are everywhere and corresponding initiatives, such as digital transformation, are launched throughout the entire organization. However, all initiatives feed on the same resources and can be conflicting in parts. At LEGO, BPM is also about aligning all those optimization projects to accomplish goals on the company level."*

Initially, AGCS used BPM for documentation purposes only, before they increasingly focused on unification and optimization. Marcus Eckhardt clarifies:

> *"During the last decade, BPM at AGCS underwent a sustainable transformation. In the beginning, it focused on process modeling to obtain a better understanding of our organizational structure. However, as the maturity of our processes increased, we started to use BPM for standardization, to achieve productivity improvements, and to increase customer satisfaction. Thus, process modeling became a supporting technique that is now occasionally used to document complex processes."*

The company has implemented a central center of BPM excellence with a team of specialized process analysts responsible for conducting and supporting company-wide BPM activities. Besides coordinating, prioritizing, and scheduling the corresponding improvement efforts, the BPM team frequently takes on the role of in-house consultants to address organizational issues that have been previously discovered by employees. Nevertheless, AGCS also witnesses local initiatives that are carried out autonomously by the respective department, and without any involvement of the central BPM department. Contrary to the hybrid strategy at SAP, however, this does not entail AGCS' implementation strategy to be hybrid, too. In fact, AGCS merges its BPM outcomes in an openly available process landscape that connects the company's processes to align its functions and departments. Pivotal for coordinating and communicating BPM activities, processes must undergo a rigorous quality-assurance process to be included in the landscape.

At Taifun, the BPM strategy followed a different path. Seeking to comply with food-market regulations, the company uses BPM to harmonize and later standardize its processes and to prepare for the certification procedure. First, BPM was initiated by a central board that determined governance rules and responsibilities. Second, the company performs periodic process audits to assess its organizational maturity, and to identify, prioritize, and improve faulty and/or low-qualitative processes.

SAP follows a holistic approach that views process orientation as a prerequisite for various applications, including unification, certification, knowledge management, and process monitoring. Because of the variety of purposes, the company organizes annual BPM events during which it consolidates different initiatives, and establishes a common BPM understanding. The company's BPM includes centralized and decentralized elements that apply to different levels of their multitier process architecture. A central body governs the first three levels, which comprise the company's core and support processes. Multiple distributed BPM teams manage the processes below level three containing its operational processes. This also applies to the company's BPM governance. Hence, SAP can gradually implement change projects on all organizational levels, and constantly realign its structures to the requirements of digital transformation.

BPM capabilities enabled the companies in our study to align their strategic objectives with the requirements of digital transformation and, thus, to define a digital strategy, which helped them to embark on their respective digital journeys. Furthermore, BPM supported them in accomplishing a process-oriented structure, which fosters employee integration and participation, and enables company-wide improvements, specifically establishing digital expertise providing relevant and required digital skills for their employees. Table 3 summarizes how the companies we studied, address these dimensions to foster BPM success.

4.3. Method and information technology

Each company draws upon *methods* and *IT* to enable and support company-wide BPM activities to not only enable better organizational agility and IT innovation, but also contribute to their digital strategy and digital expertise.

In particular, they use the Business Process Model and Notation (BPMN)[8] as a method, to create an overview of their operations and structures. The companies define guidelines and conventions to support and regulate modeling activities. Integrated BPM environments further provide guidance during the modeling task and automatically check for quality issues. In addition, most companies implement variant management systems to monitor organizational changes, and use repositories to organize the resulting process models.

With a primary focus on business services, 1&1 uses ArchiMate[9] to

[8] BPMN is a modeling notation and ISO/IEC standard used primarily by business analysts, scientists, and tool vendors. It draws upon a rich set of modeling elements to capture process semantics and it can be used to model, simulate, or execute business processes [30].

[9] ArchiMate is an enterprise architecture modeling language to improve business efficiency by providing a means to describe and model the construction of organizational structures, processes, technical infrastructures, and IT systems. The standard is provided by The Open Group, ensuring consistent standards, methods, and communication among enterprise architecture

structure its process modeling activities. While business processes are still mapped in a globally available process map, ArchiMate allows the company to embed its process-related communications in an architecture-driven dialogue that puts business services and respective capabilities into focus. Martin Petry clarifies as follows:

> *"Instead of the usual procedure of looking at business processes as the highest level of business, we take business services and business capabilities as the ultimate goal. ArchiMate allows us on the one hand to represent how business processes realize these services and capabilities and on the other hand to clarify how our corporate processes integrate with products and information systems in the sense of a complete enterprise architecture. Accordingly, we are not only operating business more service-driven and, thus, increase customer-orientation, but also facilitate communication and collaboration at product-level."*

To further facilitate communication and collaboration, the modeling task quickly became a central part of the overall BPM initiative. Martin Petry adds:

> *"At 1&1, process modeling and BPM can hardly be distinguished. Process modeling serves as a suitable entry point to BPM, as it helps our employees to think actively about their tasks and procedures, while documenting them in a structured and reproducible way. After storing the models, we make them centrally available for access by everyone. Once people start to talk about these processes and collaborate to improve them, process modeling converts to BPM."*

To facilitate employee participation, the company provides an integrated modeling environment and designs conventions to foster unification, while ensuring understandability and ease of use. Hence, conventions provide a basic structure without overcomplicating the task. Shortly after the initiative's introduction, numerous stakeholders joined the project to produce a rapidly growing process repository. Although accomplishing the company's overall BPM goals seemed feasible, they quickly realized that current guidelines and conventions yielded low-quality models that lacked comparability and interoperability. To overcome these shortcomings and thereby to improve communication, the company reassessed its initial BPM setup. They realized that guidelines and conventions not only limit the degrees of freedom during the modeling process, but also provide guidance for novice modelers. Consequently, the company defined a revised set of conventions to more strictly regulate the modeling task. Besides an intuitive drag-and-drop usability, the BPM environment automatically checks for syntactic and semantic modeling issues, and provides recommendations without enforcing them. It further provides functionalities for sharing, commenting, and editing process models to enable communication and collaboration. First, they equipped the tool with features to aggregate distributed information and promote current challenges. Hence, modelers can point to issues that may require cross-functional effort or expert knowledge. Second, they implemented a repository and a variant management system to organize and monitor the initiative's outcomes. Based on BPM methods and tools, 1&1 managed to establish company-wide communication and collaboration that also fostered skill development. Besides facilitating continuous improvements to its structures and operations, the company approaches digital transformation by involving all employees (cf. also [23]).

LEGO's BPM builds upon the Architecture of Integrated Information Systems (ARIS) framework, which provides an integrated view of their organization.[10] Specialized process analysts model processes centrally and publish them on a central platform, which connects to the ARIS system that is universally available to all employees. To assure a certain quality of BPM outcomes, LEGO uses conventions that define a baseline quality controlled by the ARIS toolset. They further defined guidelines that cover multiple aspects, including the modeling procedure, and the interconnection of processes and documents. At first, the company checked process candidates for the process map manually. However, once the repository grew, they deployed standardized check mechanisms that now automatically ensure the quality of those models. Troels Hofmann explains:

> *"At first, we primarily wanted to ensure a certain quality by controlling BPM outcomes centrally and manually. As this was time consuming and costly, we started to rely more on the ARIS tool support. Simultaneously, BPM became more popular among our employees, who soon started to check on each other to improve the quality of process models produced."*

Similar to LEGO, AGCS provides all employees with access to the modeling environment, ADONIS[11] . Hence, departments can model their processes independently, and share and discuss the results with other involved stakeholders. They can also decide whether a certain process should be published within the process landscape, which means undergoing a strong quality assurance process by the BPM team.

Process modeling at Taifun follows a custom-built approach based on define-measure-analyze-improve-control (DMAIC) and Six Sigma [34]. The company continuously measures the maturity of its processes, and uses value stream mapping to define the current and future state of their value creation process. Because of the certification procedure, process models must comply with high-quality standards. Hence, the company uses strict conventions, guidelines, and narrowly defined roles and responsibilities. To account for changing environmental conditions, they further schedule periodic audits to assess the overall modeling quality, and to collect ideas and change requests from process owners (cf. also [35]). These rules are also specified within the modeling environment, which controls them and highlights optimization potentials at runtime. The resulting process models are stored, organized, connected, and enhanced in a centrally managed repository, which is connected to a knowledge management system. While all organizational stakeholders can use these information management systems, access to the modeling environment is restricted to trained process specialists.

SAP follows a standardized BPM life-cycle approach to organize its BPM. They further draw upon complementary improvement techniques, such as lean management [36] and Six Sigma, to address specific organizational challenges. In line with its hybrid governance approach, specialized process analysts model highly important processes located within the first three levels of their process architecture. The remaining processes are addressed by distributed process stakeholders. To monitor process performance and to select and prioritize processes for BPM, the company uses an indicator system, which also helps to assess the maturity of their processes. Similar to the other companies, SAP uses an agile modeling environment to coordinate and control its BPM activities.

At all of the companies in our study, BPM methods and IT provide employees with means for communication and collaboration. On the basis of a common business understanding and means for communication, all companies use BPM methods and IT to prepare for digital transformation by using IT innovation to foster not only organizational agility, but also digital expertise on the basis of IT innovation. They use these capabilities to integrate all areas of their organizational structure, and to initiate a holistic change process for their digital strategy. Table 4 summarizes how the companies addressed the dimensions of methods and IT.

(*footnote continued*)
professionals [31].

[10] ARIS is a modelling framework based on the division of models into description views and levels for data, functions, organization, and processes. Software AG provides a family of about 20 products to create, analyze, manage, and administer enterprise models from strategy to information architecture, application landscapes, and services [32].

[11] ADONIS is a BPM and process analysis software by BOC Information Technologies Consulting GmbH based on the ADONIS business process management systems framework developed by the University of Vienna [33].

Table 4
Overview Methods and Information Technology.

	AGCS	LEGO	1&1	SAP	Taifun
Methodology	Custom-built	Custom-built	Custom-built	Custom-built	Custom-built
…based on:	(1), (2)	(1), (2)	(3)	(1)	(1), (4)
Process Architecture					
	Four-tiered	*Four-tiered*	*Five-tiered*	*Multi-tiered*	*Three-tiered*
Conventions	Restrictive	Restrictive	Guiding	Restrictive	Rigid
Guidelines	Structuring	Structuring	Enabling	Structuring	Regulative

(1) Six Sigma, (2) Lean Management, (3) ArchiMate, and (4) DMAIC.

4.4. People and culture

Finally, all the companies in our study again confirmed the importance of adequate educational offerings, to raise process awareness for successful BPM as a common baseline for digital transformation. Addressing the *people* involved and creating an inclusive process-oriented *culture,* fostered individual involvement and openness supporting creativity and risk-taking in collaborations. Consequently, both factors also contribute to digital expertise and organizational agility.

Besides training offers to improve digital expertise as already mentioned, the companies of our study actively ensure an adequate ease of using tools and BPM outcomes. Furthermore, most facilitate stakeholder collaboration, and improve their knowledge management capabilities by putting organizational knowledge into a process context. To support the organizational adoption and acceptance of BPM, the five companies foster process orientation and stakeholder commitment using different knowledge management strategies and elements. As the outcomes of BPM frequently change predominant structures, they additionally implement change management initiatives to avoid employee refusal and resistance.

Regarding their knowledge management strategies, we distinguish between two strategies, namely *push* strategy and *pull* strategy. A push strategy means that an organization actively manages knowledge, i.e., individuals strive to explicitly encode their knowledge in a shared knowledge repository as well as retrieving knowledge they need that other individuals have provided. This strategy also involves interaction and communication based on web 2.0 functionalities such as social intranets or blogs. Pulling knowledge means that individuals make knowledge requests of experts associated with a particular subject on an ad hoc basis (for further information on knowledge management strategies, see [37]). Knowledge management elements include the use of a shared repository, a collaborative modeling environment, variant management (of processes), and version management.

Most companies offer training courses to educate their employees on BPM methods and process orientation for digital transformation. 1&1 understands training as a key success factor for BPM. Martin Petry at 1&1 explains:

> *"Offering adequate training and education opportunities is always important, but it becomes pivotal for projects that rely on collaboration, such as BPM and digital transformation. Besides revealing the benefits linked to those projects, it also helps to create a quality baseline for distributed efforts. In this context, we greatly benefit from an ongoing and process-aware dialogue, which is mostly supported by dedicated employees acting as multipliers as well as social functions, such as blogs or corporate wikis provided by our integrated software environment."*

Hence, 1&1 uses a two-stage education system that is accessible to all employees. The first stage provides courses that establish a basic understanding of organizational interdependencies, process orientation, and BPM methods. In the second stage, the company focuses on advanced topics, including its process architecture, conventions and guidelines, and the interoperability of process models. They further support BPM with easy-to-use tool support and clear structures and responsibilities.

Because of the degree of centralization at LEGO and Taifun, employee training is not at the top of the management's priority list. Instead, a few highly skilled process analysts identify, analyze, and redesign relevant processes. Although their central initiatives build upon an established awareness toward processes and BPM, these companies put less effort into promoting process orientation throughout the entire organization as 1&1 does. In fact, active employee participation is primarily necessary during the process of information collection, while the BPM teams are in charge of the rest. At AGCS, most processes have been discovered, optimized, and monitored centrally. Because of resource constraints and an increased process orientation of its employees; however, local process improvements are becoming more frequent. Pursuing a hybrid implementation strategy toward BPM (cf. Section 4.2), the company welcomes and promotes these activities. To this end, AGCS provides coaching that is freely accessible to all employees to enable its workforce throughout all business departments to act independently on process improvements, while promoting the quality of outputs at the same time. Eventually, the central team's quality assurance process decides whether local optimizations are finally included to the company-wide process landscape.

Similar to 1&1, SAP provides a comprehensive education program. Although less focused, the company offers training courses and online classes on specific challenges and topics. In addition, they provide participants with cross-functional best practices and guidelines. Because of the wide range of purposes linked to BPM, ensuring understandability is highly important for this company. To summarize the outcomes of the hybrid BPM approach, SAP integrates all activities within its multitiered process architecture. Hence, the central BPM team refines and connects all process models to create an integrated system. They further establish a glossary to build a knowledge management system that connects to the BPM environment. Ultimately, they facilitate process awareness by organizing periodic meetings at which all BPM participants exchange opinions and experiences, to obtain a more detailed picture of the overall strategy and progress.

By addressing the dimensions of people and culture, the companies, in particular, managed to improve collaboration and foster openness to establish process orientation and improve necessary skills. Their employees can use these skills and the IT infrastructure to improve and innovate. Table 5 summarizes the companies' setup of the people and culture dimension.

5. Recommendations for the design of digital transformation projects using BPM

5.1. Derivation of recommendations from cases

So far, we have presented from multiple perspectives, how our case companies approach digital transformation using BPM. In the following, we use this knowledge to derive generalizable recommendations for companies, and in particular, SME that seek to prepare for

Table 5
Overview People and Culture.

	AGCS	LEGO	1&1	SAP	Taifun
Education Program	Differentiated training courses	Restricted to process analysts	Differentiated training courses	Differentiated training courses	Restricted to process analysts
Knowledge management Strategy	Pull strategy	Push strategy	Push strategy	Pull & push strategy	Pull strategy
Knowledge management Elements	(a), (b), (d)	(a), (b), (c)	(a), (b), (d)	(a), (b)	(a), (b), (d)

(a) Shared repository, (b) collaborative modeling environment, (c) variant management (of processes), and (d) version management.

digital transformation using BPM. In doing so, we derive recommendations for the design of digital transformation projects and explore how these can be configured to a company's context.

Initially, companies must carefully analyze their environment and determine their business needs, to effectively address the technological, organizational, and operational requirements of digital transformation. Naturally, organizational and environmental conditions influence the design and implementation of projects.

While the deployed strategies of our case companies covered all capability areas of the Six Core Elements of BPM framework and addressed the introduced requirements for digital transformation, we found that companies use unique configurations to accomplish their individual goals related to their digital transformation projects.

Some of these goals can be supported through generalizable recommendations. However, we have found that the choice of the meta objective of the digital transformation project determines the choices for those configuration recommendations we observed as contextual.

In Table 6, we consolidate our findings and present recommendations for digital transformation projects using BPM based on the requirements established in Table 1. While we see *general configurations* as universally applicable for each strategy, *contextual configurations* associate with the individual recommendations for digital transformation projects previously defined. We italicized some terms in the Description column of Table 6, to indicate their linkage to the requirements outlined in Table 1. More details on the derivation of the recommendations from the interviews including interview digests can be found in Appendix B. Each row corresponds to a recommendation that was inferred from the companies of our study. In addition, we provide a more general description of each recommendation, which includes a brief motivation as well as implications for a company's strategy.

5.2. Contextual configuration of recommendations

As mentioned above, not all companies addressed each requirement and, thus, the recommendation in the same way. In fact, we noticed that some requirements were similarly met, while responses to others varied across companies. To account for these *general* and *contextual* components, we included a corresponding column in Table 6.

While recommendations for both types of configurations are important, they require different approaches for their implementation. *General* recommendations do not integrally depend on individual characteristics. For example, all companies embarking on digital transformation using BPM developed a communication plan, to provide their employees with the necessary information about the transformation project. They further highlighted the importance of an integrated and easy-to-use IT infrastructure, without linking such characteristics to a particular goal or initiative. Hence, we consider them as general recommendations. Companies can ensure meeting many of these *general* recommendations by drawing from existing organizational knowledge or by using recommendations from research as an implementation blueprint. We do not focus on these recommendations in the following. By contrast, *contextual* recommendations demand a situational configuration. Consequently, companies must align these recommendations with their environment and with their goals and – more importantly – with their meta objective.

While the case companies use different approaches to implement general and contextual characteristics, we found that they choose from a fixed set of configuration options. See Table 7 for a summary of the subsequent discussion.

The companies follow different concepts with regard to *governance and compliance*. In *top-down* approaches, a central team is responsible for the quality of the outcomes, including process models or suggestions for redesign. By contrast, *a bottom-up* design builds upon a system of mutual control implemented by distributed employees collaborating within a project. Similar to the interaction model, companies can also conduct *hybrid* governance control, which is based on local efforts organized within a central structure and serves the same recommendation.

As all projects will likely result in organizational change and demand for sufficient resources, their success relies on *management support*. Although the top management of all companies openly agreed with the deployed endeavors, they adjust their overall commitment to the corresponding needs of their strategy. Management participation ranges from *observing,* to *supporting,* to a management that is actively *involved*.

To implement the designated strategy within the different parts of the organization, the companies can generally choose between different *interaction models*, namely a *top-down* and a *bottom-up* approach. While *in top-down* projects, work is performed by process analysts employed within a centralized department, bottom-up approaches indicate distributed optimization efforts at the place of process execution. By combining characteristics of both designs, the *hybrid* approach entails multiple decentralized projects that are aligned within and coordinated by a central instance.

We identified three types of *educational efforts* that differ regarding their scope and implementation design. *Targeted* education systems focus on a small number of key users or process analysts, who are most likely responsible for analysis and design activities. *Selective* education strategies widen the scope of targeted approaches by including all stakeholders affected by the projects. Ultimately, *open* approaches entail the provision of an education system that seeks to enable basic BPM skills for all organizational stakeholders to establish digital expertise.

While all companies implement software solutions to support their activities, the *tool support* differs according to the degree to which they facilitate interaction, collaboration, and openness. On the one hand, *individual* tools focus on providing support for core activities, such as process modeling or monitoring. On the other hand, *collaborative* software comprises social networking functionalities and, thus, goes beyond a pure functional focus. In fact, they are equipped with features that facilitate communication among employees and provide means to generate, share, and discuss personal opinions.

As process modeling is used for a variety of purposes, the companies in our study support and/or regulate the task with *conventions and guidelines*. Depending on their digital strategy and their intended involvement, they specify modeling conventions to ensure process model interoperability. In scenarios, for which modeling quality is less relevant, conventions and guidelines are used exclusively to *guide* the modeling process to reduce complexity rather than to regulate it. Generally accepted modeling guidelines can be used to augment them with additional specifications Mendling, et al. [38]. For companies

Table 6
Consolidated Findings with Recommendations for the Design of Digital Transformation Projects Using BPM.

	Recommendation	Description	Configuration Type
Digital Strategy	Define clear goals for the digital journey	BPM can accomplish various goals ranging from improving performance measures to increasing agility, flexibility, and responsiveness. While realizing all benefits at once seems desirable, different goals require different strategies. Hence, it is advantageous to focus on one set of goals while accomplishing others in subsequent projects.	General
	Define governance and compliance mechanisms	While rules and responsibilities (*agility*) provide a basic structure, the success of a digital strategy naturally also depends on the actual implementation. One needs to establish adequate control mechanisms that consistently follow centralization or decentralization.	Contextual
Agility	Ensure management support	Management commitment is essential for the success of any project. It is, however, important to understand what type of management support is actually necessary to maintain agility based on the *digital strategy*. One needs to identify, analyze, and estimate needs for organizational and financial resources.	Contextual
	Establish a suitable interaction model	Complex systems require interaction rules to ensure that the right things are done and that they are done in the right way. One needs to define and implement a consistent system of rules, roles, and responsibilities that fosters accountability and decision-making end enables *collaboration.*	Contextual
	Provide a process architecture to coordinate and integrate distributed efforts	Processes can connect to a complex organizational system with numerous interdependencies and weak ties. To improve decision-making and to coordinate all activities, one must provide a process architecture that comprises at least a strategic, a business, and an implementation level.	General
Digital Expertise	Provide an education program	Having well-trained participants is essential for the quality of a digital transformation project. Hence, the project can greatly benefit from the employees' process awareness and their understanding of corresponding concepts as defined in the *digital strategy*.	Contextual
	Establish process-oriented knowledge management	A major benefit of using BPM is the exposure of implicit process knowledge and weak ties. Using that knowledge can improve the organizational procedures and structures when integrated with a working knowledge management.	General
IT Innovation	Provide adequate tool support	Implementing adequate tool support noticeably improves the effectiveness and efficiency of BPM and, thus, digital transformation. However, as different tools can be used for different purposes, one should consider organizational requirements (*agility*) for tool selection.	Contextual
	Integrate the IT infrastructure	The outcomes of BPM are helpful for other initiatives as well. Distributed information sources and/or distinct dependencies between data and software turn reutilization into a complex task. To ensure adequate interconnectivity, one should favor a shared repository that fully integrates with other software solutions.	General
Collaboration	Integrate improvement initiatives	Because of operating in a dynamic environment, it is sometimes necessary to launch multiple projects at the same time. To avoid opposing objectives and to ensure the efficient use of resources, one must integrate these initiatives according to the *digital strategy*.	General
	Facilitate stakeholder collaboration	In process-aware organizations, one must ensure adequate communication and collaboration among stakeholders. Thus, implementing a central platform, which is equipped with some social networking functionalities and universal accessibility can be beneficial.	General
	Define conventions and guidelines to support or regulate process modeling and process interoperability	Process models are critical to successful digital transformation projects using BPM as they provide the basis for analysis and optimization. As modeling can be complex and time-consuming, the resulting models' quality can greatly benefit from guidelines and conventions that support or regulate the task ranging from those fostering usability and creativity to those fostering formal languages and automation.	Contextual
	Manage model versions and variants	Analyzing older model versions can help to uncover gradual shifts in stakeholder or customer needs. While process models can foster communication, they can also be used as blueprints for one's operations. Consequently, one should implement an adequate version and variant management to trace the mutability of the organization.	General
Openness	Develop a comprehensive communication plan	As organizational improvements take time, some benefits are realized only in the long-term. To maintain employee motivation, a detailed communication plan should link the digital transformation project to the *digital strategy* of the company.	General
	Ensure stakeholder commitment	The success of digital transformation projects depends strongly on the stakeholders' willingness to participate. One should constantly highlight the benefits, align corresponding procedures to organizational requirements (*agility*), and ensure the intuitiveness of its outcomes.	General
	Ensure adequate ease of use	Outcomes can accomplish multiple objectives, but they must be sufficiently applicable and understandable. Hence, one should keep the project's setup simple, communicate actions clearly, and ensure tool accessibility and applicability.	General
	Facilitate process orientation.	The ability of employees to participate in digital transformation depends on their process-awareness. In functional organizations, process orientation does not emerge naturally. Instead, one must communicate the benefits and provide educational offers (*digital expertise*).	General

seeking to ensure high-quality process models, conventions provide the means to *restrict* the use of corresponding constructs, and to coordinate distributed modeling efforts. Ultimately, some purposes require a process model design that complies with external specifications. Hence, the companies must determine a *rigid* set of conventions. The process modeling repository needs to mirror these decisions by providing adequate control mechanisms.

Table 7 does not only serve as an overview but also represents a morphological box that provides decision support for companies – especially SMEs – that seek to prepare for digital transformation using BPM. Based on our morphological analysis, we have found three *meta objectives* the companies in our study followed. These determined major

Table 7
Configuration Options for Contextual Recommendations.

Governance and Compliance	Bottom-up	Hybrid	Top-down
Management Support	Observing	Supporting	Involved
Interaction Model	Bottom-up	Hybrid	Top-down
Education	Open	Selective	Targeted
Tool Support	Collaborative	Individual	
Conventions and Guidelines	Guiding	Restrictive	Rigid
Meta Objective	Communication/ Learning	Unification/ Optimization	Automation/ Certification

parts of the contextual configurations. We discuss them in the following section.

6. Strategy archetypes for digital transformation meta objectives using BPM

6.1. Overview of the meta objectives

We have shown that successfully initiating digital transformation using BPM requires companies to implement a set of general recommendations. Moreover, they must configure multiple contextual elements depending on their overall meta objective. By analyzing the companies included in our study, we have derived six categories with seventeen characteristics.

Furthermore, we examined how the case companies have designed their digital transformation projects to derive configuration profiles. The companies excel in putting these meta objectives into action, allowing us to derive actionable design patterns for their implementation. This does not imply, however, that BPM in these companies is limited to this particular meta objective. We summarize our results in Fig. 2.

Based on Fig. 2, we can identify three patterns to approach the meta objectives, each defining a strategy archetype for digital transformation. Our results indicate that *communication/learning* and *automation/certification* strategies require a rather opposite configuration in the contextual components.

The *communication/learning* strategy relies on the openness of employees toward acquiring new digital expertise. Hence, companies must provide sufficient degrees of freedom, and easy-to-use tools and structures to facilitate stakeholder adoption. For example, this strategy beneficially relates to bottom-up managed governance, as centralized control can evoke resistance and hamper adoption. Strict guidelines and conventions can further limit the methods' ease of use, and impede their diffusion within the organization.

By contrast, *automation/certification* strategies demand for a consistent system of strict rules, standards, responsibilities, and conventions to allow for IT innovation according to their strategy. By failing to align these dimensions, they risk decreasing service levels, and likely need to deploy significant resources to fix errors.

Ultimately, companies should seek a hybrid approach if they seek *unification/optimization* to advance agility and collaboration with stakeholders. This entails that they provide rules and guidelines that ensure understandable and applicable outcomes. However, they also depend on employee participation to collect the knowledge necessary for the identification of optimization potentials.

To some respect, the meta objective can be considered successional in terms of digital maturity forming a cycle where a mature and automated organization has to embark on learning time and again.

6.2. Communication/learning strategy

For companies, and in particular SMEs, seeking communication and learning to prepare for digital transformation, we recommend establishing an approach that builds upon decentralization and collaboration. To foster adoption on operational levels, a company's top management should openly agree with but not actively intervene in the project. Yet, the strategy demands a comprehensive communication

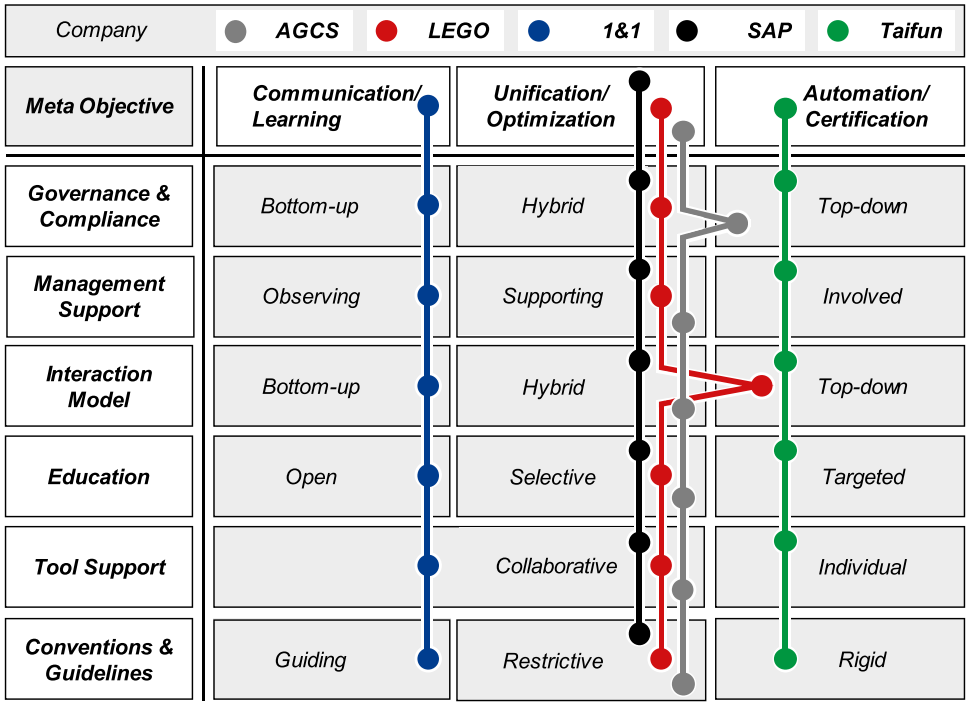

Fig. 2. Case Company Profiles of Digital Transformation Projects.

Table 8
Communication/Learning Strategy Archetype.

Meta Objective	Communication/ Learning	Unification/ Optimization	Automation/ Certification
Governance & Compliance	Bottom-up	Hybrid	Top-down
Management Support	Observing	Supporting	Involved
Interaction Model	Bottom-up	Hybrid	Top-down
Education	Open	Selective	Targeted
Tool Support	Collaborative		Individual
Conventions & Guidelines	Guiding	Restrictive	Rigid

plan that summarizes the collaborative strategy and highlights potential benefits for individual stakeholders. As the approach can result in large process collections, companies should further establish a process architecture that links and integrates their operations.

To implement this strategy successfully, companies must ensure broad employee participation. Hence, they should keep central regulation to a minimum and establish a bottom-up managed governance that delegates decision-making and accountability to a self-regulating social system. To support process discovery and analysis, companies should use a process modeling language that is easy to understand, and avoid conventions that complicate and restrict the modeling task. However, they should periodically evaluate the quality of the resulting process models, and intervene if they lack interoperability or applicability. As employees are typically new to process orientation, they should provide guidelines and best practices. As collaboration and communication are key to this strategy, companies must implement a ubiquitously accessible software tool that guides BPM activities and provides social networking functionalities, such as sharing, commenting, or voting.

To ensure process orientation and stakeholder commitment, companies rely on asset-building training offers that include both courses on BPM basics and on advanced topics. While participation should remain optional, the courses should be open to all employees and offered periodically. Furthermore, they should ensure that the project's structure and corresponding outcomes are as easy and manageable as possible, and constantly gather employee feedback to implement optimization potentials. We summarize the configuration of the communication/learning strategy archetype in Table 8.

6.3. Unification/ optimization strategy

As the unification/optimization strategy involves the comprehensive analysis of a company's organizational structure, a communication plan should highlight expected benefits of the project and provide information about its scope, procedure, and responsible stakeholders. Although corresponding projects are typically less regulated, a supportive top management can noticeably improve employee acceptance and willingness to participate. To coordinate activities, process architecture can integrate all processes, and provide an operational overview.

To ensure both high-quality outcomes and a comprehensive understanding of organizational necessities, we recommend companies to establish a governance approach that combines top-down and bottom-up aspects. Thus, they can centrally conduct decision-making and ensure accountability, while collecting information at the place of process execution. In addition, companies should support process discovery and analysis by defining conventions that facilitate process model applicability and comparability. However, they should remain agile and not overregulate the task, and should facilitate adequate model expressiveness. As involved process modelers are typically experienced, supporting guidelines and methodologies can focus on social and organizational aspects, such as interview guidelines or departmental constraints. While the software support should allow stakeholders to quickly access necessary information, variants facilitate the modification of standardized processes for individual purposes. In addition, we recommend tool support that guides BPM activities, fosters collaboration, and is integrated with their IT infrastructure.

The success of this strategy depends on stakeholder participation, as stakeholders provide the information necessary for optimization. Hence, companies should facilitate process awareness and commitment. They can further provide an education program that is available to all involved stakeholders, and designed to increase its productivity and effectiveness. Although stakeholders are less involved in BPM activities, they typically use its outcomes extensively. Hence, companies must ensure the ease of use, intuitiveness, and comparability of BPM results, to facilitate communication and collaboration. Table 9 summarizes the recommended configuration for the unification/optimization strategy archetype.

6.4. Certification/automation strategy

To implement the certification/automation strategy, companies must ensure top management involvement and high-quality of BPM outcomes. Thus, we recommend implementing a top-down managed governance, which defines rules, roles, and responsibilities centrally and constantly monitors their compliance as part of an explicit strategy. We further suggest establishing a multistage reviewing process, which should include multidisciplinary stakeholders to cross-check the quality of results before transferring processes to a production environment.

For process discovery and analysis, companies should define a set of strict conventions that consistently address organizational, technical, and regulative constraints. As the strategy requires high-skilled process analysts, guidelines typically have an insignificant impact on modeling quality and can be limited to key aspects. Centrally providing best-

Table 9
Unification/Optimization Strategy Archetype.

Meta Objective	Communication/ Learning	Unification/ Optimization	Automation/ Certification
Governance & Compliance	Bottom-up	Hybrid	Top-down
Management Support	Observing	Supporting	Involved
Interaction Model	Bottom-up	Hybrid	Top-down
Education	Open	Selective	Targeted
Tool Support	Collaborative		Individual
Conventions & Guidelines	Guiding	Restrictive	Rigid

Table 10
Certification/Automation Strategy Archetype.

Meta Objective	Communication/ Learning	Unification/ Optimization	Automation/ Certification
Governance & Compliance	Bottom-up	Hybrid	Top-down
Management Support	Observing	Supporting	Involved
Interaction Model	Bottom-up	Hybrid	Top-down
Education	Open	Selective	Targeted
Tool Support	Collaborative		Individual
Conventions & Guidelines	Guiding	Restrictive	Rigid

practice models can support the modeling process by serving as reusable modeling templates. Companies must also facilitate success by providing tool support that controls modeling quality at runtime and deploys corrective actions automatically. In addition, companies rely on an IT infrastructure that is integrated seamlessly to increase the feasibility and manageability of process automation.

Companies can limit their education programs to periodic training courses on advanced topics, which are typically necessary due to changing organizational constraints. Ultimately, process-oriented culture aspects are less relevant, as corresponding projects involve only a small and controlled number of employees. We summarize the recommended configuration for the unification/optimization strategy archetype in Table 10.

7. Concluding remarks

Notwithstanding its perceived importance for future competitiveness, the phenomenon of digital transformation remains poorly understood. Both research and practice frequently struggle to provide actionable guidance for companies. To overcome these shortcomings and, thereby, provide companies with practicable and actionable recommendations, we have described how five companies successfully approached digital transformation by leveraging BPM to build the capabilities and competencies necessary for corresponding projects.

We have found that digital transformation takes place in many contexts and that companies follow different strategies to become more digital. Although digital transformation projects pose significant organizational, technological, and sociocultural challenges, we found that successfully unfolding the potentials of the digital age can be broken down to several general and contextual recommendations. By integrating our findings from the case analysis, we have derived three digital transformation meta objectives. We found that these meta objectives vary between *communication/learning*, *unification/optimization*, and *certification/automation*. Based on these meta objectives, we provide actionable guidance on how companies can set up digital transformation projects, and how these can be configured to their individual requirements.

Exemplarily, we recommend companies that embark their digital journey following the communication/learning strategy archetype to build their actions on decentralization and collaboration. In contrast, the certification/automation strategy archetype suggests implementing a top-down managed governance along a rather authoritarian configuration. Eventually, companies pursuing the unification/optimization strategy archetype fare best when employing a hybrid model.

By providing both general and contextual recommendations for each strategy archetype, we consider their application as unique implementation blueprints to deploy projects successfully according to a company's distinct meta objective. In doing so, we provide decision support for leaders who seek to initiate their digital journey.

Finally, we want to emphasize the strategy archetype's viability and usefulness for SMEs, as their individual instantiation provides them with the means to approach digital transformation goals in a systematic and structured way. Hence, they can avoid a costly trial-and-error procedure and conserve organizational resources, as they often lack the capacity to research and test their approach.

Despite the mentioned limitations, our research makes several contributions and has important implications for research on digital transformation in organizations. In particular, our archetypes point out that digital transformation projects do not have to focus solely on immediate monetary gains but can, and should, focus on skill development as well by pinpointing learnings rather than failures.

CRediT authorship contribution statement

Marcus Fischer: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration. **Florian Imgrund:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration. **Christian Janiesch:** Conceptualization, Methodology, Formal analysis, Resources, Supervision, Writing - original draft, Writing - review & editing. **Axel Winkelmann:** Methodology, Resources, Supervision, Writing - review & editing.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.im.2019.103262.

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