

How Enterprise Architecture Maturity Enables Post-Merger IT Integration

Robert Lorenz Törner^(✉) and Stefan Henningsson

Department of Digitalization, Copenhagen Business School,
Howitzvej 60, 2000 Fredriksberg, Denmark
{rlt.digi, sh.digi}@cbs.dk

Abstract. While world-wide Mergers and Acquisitions (M&As) activity continues to accelerate, a substantial proportion of deals fails to yield the expected value. The inability to plan and implement post-merger integration of information technology contributes substantially to these failure rates. This paper advances the argument that a company's pre-existing Enterprise Architecture decisively shapes the capability to implement post-merger IT integration and subsequently realize benefits from M&A. Our multiple-case study investigates three acquisition cases and develops an explanatory theory of how Enterprise Architecture maturity enables the implementation of distinct integration strategies. The results do not only enrich the academic literature on M&A, but also show the strategic value of Enterprise Architecture maturity.

Keywords: Mergers & Acquisitions · Enterprise Architecture · Post-Merger IT Integration

1 Introduction

Companies are using Mergers and Acquisitions (M&As) more than ever before as a regular instrument in the pursuit of overall corporate strategic goals [1]. Most commonly, however, these investments do not create value for acquirers per-se, but require acquisition targets to be integrated into the buying company to reap intended business benefits, such as synergies or enhanced capabilities [2]. Recent market research and case evidence reveal that the inability to do so effectively has led to an acquisition failure rate of beyond 50 percent in the past decade [3, 4].

In this context, one of the most complex challenges of the post-merger period remains the integration of information technology (IT) between the merging parties, commonly referred to as post-merger IT integration (PMITI). As IT is entangled with companies' operational as well as strategic business processes [5], its integration turns into a crucial task to keep business running during mergers, avoid short-term business disruptions and reach long-term acquisition goals [6]. Business slowdown due to turbulences in IT integration does not only imply forgone earnings, but can also result in extremely costly long-term consequences, such as permanent loss of customers [c.f. 7]. During integration projects, "companies have a critical window of time to get the most out of the merger or acquisition" [8, p. 10]. Under tremendous time pressure ideal solutions to integration cannot be constantly ensured and the integration period itself

becomes accordingly in many cases a best effort endeavor. Therefore, “being ready at that juncture, at the close, provides a great platform for integration success” [8, p. 10].

The current state of academic literature recognizes this need for preparation not only through careful planning of individual integration projects, but also in terms of long-term capability development to become “ready-to-acquire” for any possible future merging partner [9, 10]. In that vein, the accumulation and exploitation of capabilities to diagnose and implement appropriate integration strategies allows acquirers to reach short-term acquisition benefits and long-term acquisition goals [11]. The current state of the literature furthermore suggests that these capabilities should be complemented by the development of a standardized, scalable, and flexible IT platform [10–13]. However, by focusing on the technical IT infrastructure, existing research only considers the lower layers of Enterprise Architecture (EA) and neglects that IT systems are nowadays highly intertwined with organizational business processes. Additionally, current studies do not elaborate in detail, how these virtues are implemented architecturally or why they enable companies to overcome inherent challenges of distinct PMITI strategies.

EA, on the other hand, is solely addressed by existing work on PMI in terms of management capabilities and their effect on integration success [14]. Given the fact that these structures are, along with people, the main elements to be integrated, a sharper focus on the design of EA, as such, is necessary. This paper therefore sheds light on the following research question: How does a company’s existing EA enable the implementation of different PMITI strategies?

To answer these research questions, we embark on a multiple-case study on three acquisition cases. Within a resource-based perspective, we analyze to what extent the constituent resources and capabilities of different EA maturity stages [15] enable acquirers to overcome challenges of distinct PMITI strategies and reach desired acquisition outcomes. As a result, an explanatory theory [16] on how EA maturity enables the implementation of distinct PMITI strategies is established.

2 M&A and the Integration Challenge

M&As are most commonly motivated by either the quest for “cost economies and market power” or the access to “strategically important resources and capabilities” [2, p. 398]. Even though they comprise two distinct forms of organizational junction, mergers as well as acquisitions entail the transfer or combination of company ownership and a differentiation is not relevant for the purpose of this paper.

M&A by themselves do not necessarily imply a need for integration of organizational structures between the involved parties after the transaction. Instead, “the degree and mode of integration should be dependent on synergies expected as a higher level of integration is resource demanding” [17, p. 26]. Therefore, scholars as well as practitioners have emphasized the need to carry out in-depth pre-merger planning before the deal is signed to align the overall integration strategy as well as the IT integration strategy with overall acquisition goals [9, 18].

In the academic literature, four generic PMITI strategies have emerged that cater for distinct degrees of integration required and can be implemented as manifold combinations or in their singular form. The *Absorption* strategy assumes that one company’s

IT resources can support the operations of both entities and expands these resources into the other company, whose previous systems are shut down and replaced. The *Co-Existence* strategy maintains both companies' IT resources partially or entirely and connects them via bridges to exchange data or functionality. The *Best-of-Breed* strategy, in turn, aims for process enhancements and postulates the deliberate selection of individual IT-based business processes from both companies based on their superiority. Commonly, this strategy is implemented by rebuilding one company's superior processes on the other company's IT platform, which is subsequently rolled out in the merged organization. In contrast to these three path-dependent strategies, the *Renewal* strategy is path-breaking and triggers an organizational transformation by retiring both organization's IT resources as well as substituting them by the development of completely new ones [10].

After closing the deal, the subsequent implementation of the singular or manifold strategy is executed by combining both organization's IT resources to achieve the intended business benefits [10]. Based on distinct mechanisms, each strategy requires the completion of different implementation tasks to reach the desired target state.

As a result from previous M&A, but most importantly as an enabling factor during PMITI, the literature proposes different concepts of organizational PMITI capabilities that effect the outcome of individual PMI projects [11, 12, 19]. In that vein, *Diagnostic* and *Implementation Capabilities* are put forward that entail the "ability to select the appropriate mix of IT integration strategies" and "the ability to redeploy the combined IT resources post-acquisition contingent on the [...] strategies selected" [11, p. 9ff]. These capabilities do not only enable superior short-term M&A benefits, but also long-term strategic IT alignment and organizational performance [11].

Yet, becoming "ready to acquire" is not limited to capabilities in the form of knowledge, but also requires appropriate underlying resources for integration to be in place. For this purpose, the adoption of a standardized, scalable, and flexible IT platform is postulated in the literature [10, 12, 13]. However, a more fine-grained analysis of how such a platform can be implemented architecturally and how its inherent characteristics can enable an acquirer during the inherent PMITI challenges of distinct integration strategies is still missing. The "next step in theory development would include an analysis of the interaction between organizational IT integration capabilities and the nature of the specific IT integration challenge" [20, p. 14].

Therefore, this paper fills the identified research gap by investigating on a more fine-grained level, which integration challenges merging companies face during the architectural implementation of Absorption, Co-Existence, Best-of-Breed, and Renewal strategies. The analysis reveals concrete requirements that distinct integration strategies pose on merging companies' EA. These demands allow for inferences on virtues of an EA that enable companies to successfully implement the elaborated PMITI strategies architecturally and reap short- as well as long-term acquisition benefits. By relating these virtues to the concept of EA maturity, we elaborate in-depth, how a mature EA enables companies to implement distinct PMITI strategies successfully.

3 Enterprise Architecture and Maturity

To achieve superior performance, companies should build a solid foundation for the execution of their strategy that efficiently carries out core processes by digitizing them in IT systems [15]. The establishment of this foundation is a tough strategic decision that requires high levels of attention during definition, but afterwards allows for the automatic and effective exploitation of core capabilities as well as routine business activities [15].

3.1 Operating Model

The operating model represents “a general vision of how a company will enable and execute strategies” [15, p. 38]. All enterprises adopt an overarching operating model at the corporate level, but might at the same time also define distinct operating models at lower levels, such as the business unit or divisional level [15].

During its definition, management teams have to decide on “the necessary level of business process integration and standardization for delivering goods and services to customers” [15, p. 8]. In this context, integration “links the efforts of organizational units through shared data” and allows for end-to-end processing of transactions, the presentation of a single face to customers, and accurate information for managerial decisions [15, p. 27]. Process Standardization refers to their equal execution independently from location or performer. This reduces variability in execution and can imply “dramatic increases in throughput and efficiency” [15, p. 27].

Based on the two presented dimensions, four different types of operating models can be adopted [15]. A *Diversification* operating model is characterized by low levels of business process standardization and integration. A *Unification* strategy comprises high levels of both. *Coordination*, on the other hand, leverages high integration and low standardization. Finally, *Replication* works the other way around [15].

3.2 Enterprise Architecture

Once an operating model has been defined, it is to be implemented in the form of an effective EA. For that purpose, EA is defined as “the organizing logic for business processes and IT infrastructure reflecting the integration and standardization requirements of the company’s operating model” [15, p. 47]. Graphical representations are commonly used for the elaboration as well as communication of results [15]. These designs contain just enough detail on business processes and data sharing to understand company operations. For the implementation of EA, however, a deeper understanding of the interplay between people, processes and IT is necessary [15]. For that reason, EA is in the IT context often divided into four layers from the bottom to the top: the technology architecture (IT infrastructure), the application architecture, the data or information architecture, and the business process architecture. Lower layers provide the foundation for higher layers to operate on. The composition of the lower three levels makes up a company’s IT architecture.

3.3 EA Maturity

During the implementation and posterior advancement of EA, companies commonly experience a journey from initial ventures to build their foundation for execution via the emergence of new technologies, and changes in economic boundary conditions. In the course of this voyage, enterprises usually experience similar challenges that require the modification, and implementation of new systems as well as processes without disrupting on-going business. At the same time, they harvest increasing benefits, such as lower IT cost and greater strategic agility. [15] reveal that companies generally traverse consistent patterns during the advancement of their EA, which the authors label the “four stages of architecture maturity”: *Business Silos*, *Standardized Technology*, *Optimized Core*, and *Business Modularity* [15, p. 70].

While companies in the Business Silos stage do not standardize nor integrate processes end-to-end, the Standardized Technology stage is characterized by an increasing acceptance of standard IT solutions to enable cost savings and reliability. In the Optimized Core stage, companies move from local applications and shared infrastructure to the adoption of enterprise resource planning (ERP) systems, a centrepiece of optimized standard processes as well as shared data. Finally, in the Business Modularity architecture stage, companies gain strategic agility by modularizing previously digitized business processes and their supporting IT systems.

4 Research Method

This study adopts a case study approach [21, 22] to develop an explanatory theory of how the existing EA enables (or constrains) PMITI. Explaining and predicting theories are closely related to prescriptive design theories. A multiple-case study is chosen to develop general explanations that fit the varying details of each singular case [21]. By showing the influence of changing contextual factors, multiple-case studies “yield more general research results than single cases” [22, p. 609].

A total number of seven semi-structured interviews with key informants were conducted as a primary source of evidence [23]. The case companies had been selected by using the M&A database Zephyr to search for large, multi-national companies headquartered in Denmark or Germany. For that purpose, an interview guide containing open-ended questions was created that investigated on the state of EA in each case company as well as its role during PMITI. With exception of one interview, all others were recorded, transcribed, and added to a case database (Yin, 2009). For the purpose of triangulation, secondary data in the form of newspaper articles, press releases, company websites, detail information from the Zephyr database, share prices, and architecture plans was used as additional sources of evidence.

Due to the fact that the three case companies exhibit bold differences in size, industry, and EA setups, contextual factors vary severely between the cases, which supports the generality of the eventual findings [22].

Data analysis subsequently applied paragraph-level coding by concepts known from the literature. Based on within-case analysis and cross-case comparisons, the eventual research model was established and substantiated [22]. Following the coding,

case stories were developed containing plenty of individual quotes by the informants to support the line of reasoning.

5 Case Evidence

In this section, the multiple-case study involving three cases with companies of different size as well as industry is introduced to elaborate our theoretical model. First, the acquisition and Best-of-Breed integration of BiotechComp by the ChemicalCorp is presented. Then, the case of EngineeringCompA acquiring WaterTechCompA provides insights into what drives a Renewal strategy. Eventually, the merger between FinancialBankA and KreditBankB extends the context of this study to M&A in general.

5.1 ChemicalCorp

ChemicalCorp is a large global chemical company that serves business-to-business (B2B). In addition to chemical products, the closely related business segments also include crop protection products. ChemicalCorp's IT is managed centrally from its competence center for information services and the entire organization's IT infrastructure is provisioned by an external contractor.

Particularly since the beginnings of the 21st century, ChemicalCorp has become a serial acquirer, purchasing mostly several companies per year. ChemicalCorp relies on a Unification operating model to enable operational efficiency through high degrees of standardization and integration. A Business Integration Manager (BIM) explains: "I would say [processes are] probably about 75 percent standardized" and "data is probably close to 100 percent integrated". This operating model is implemented through an EA that builds on a one-instance SAP system. ChemicalCorp's processes and modules are standardized on this platform and used by all business units worldwide. Local exceptions to standard processes are only allowed, if they are critical to business continuity. Moreover, the SAP platform is based on a Service-Oriented Architecture (SOA) and implements a Business Process Engine that enables the flexibility to reconfigure and reuse business processes steps without the need for code customizations. "It's more based upon a process engine [...] we do very little hard-coding within the system [...] to keep [it] flexible" (BIM - ChemicalCorp).

ChemicalCorp's crop protection business specializes on the development of seed treatment technologies that protect agricultural crops from diseases, weeds, or pests. Since its establishment, the division has been growing organically as well as through M&A. To gain capabilities in biological crop protection and refocus on the North-American market, the division decided to acquire the US-based global provider of biological crop protection products BiotechComp in 2012.

Major synergies should result from providing the acquired unit access to ChemicalCorp's global R&D platform as well as new markets and customers. Via ChemicalCorp's sales force, BiotechComp could sell products in significantly larger numbers and harvest economies of scale. These acquisition goals drove the integration project's strategy and implementation. As the Lead of Integration (LOI) explains, the concept

was already clear during the later stages of due diligence: “We wanted to integrate the business to 100 percent. So a standalone was not an option.”

For ChemicalCorp’s IT experts, due diligence allowed for a first inspection of the acquisition’s IT landscape and revealed an eminently immature EA. BiotechComp had been growing through M&A in the past and ChemicalCorp was now “dealing with three basic non-connected ERP systems.” (LoI - ChemicalCorp).

Following the overall integration concept and basing on the acquirer’s stringent Unification strategy, a Best-of-Breed strategy was chosen for IT integration. On the one hand, ChemicalCorp’s superior IT systems were entirely rolled out in BiotechComp, replacing existing systems and spreading standardized ChemicalCorp processes throughout the acquisition. “I told them [...] there will be a full integration. No discussion! [...] Their processes have been a nightmare. So their IT unit actually came to us: ‘Whatever you give us, it will be better than what we have!’” (LoI – ChemicalCorp). On the other hand, the acquisition also targeted the adoption of some unique superior capabilities from BiotechComp that were rebuilt as processes on ChemicalCorp’s platform. According to the BIM, integration consisted of “90 percent data migration and probably 10 percent unique process-driven integration”.

From an IT perspective, the Best-of-Breed strategy’s implementation required the completion of four main tasks: data migration, process migration, system rollout, and change management. “Data management is actually the biggest component when you are transforming a company into a ChemicalCorp system” (BIM – ChemicalCorp). Hence, as one of the first work streams, dedicated master data specialists for the agricultural business were sent to all BiotechComp sites to collect and manually enter master as well as product data into ChemicalCorp’s ERP platform. “We looked at every single data point by hand, approved it and put it [...] in our organizational structure. [...] So it was roughly 20 to 40 [fixed duration employees] only doing master data. And they did this for half a year” (LoI - ChemicalCorp). ChemicalCorp’s strict adherence to a central data scheme enabled division to successfully migrate all business-critical master data and avoid posterior business disruptions. “If you do not set up strict rules, you come into trouble relatively quickly. And the consequence out of that are non-shipments. [...] Our failure rate was extremely good [...], because we paid so much attention to master data” (LoI - ChemicalCorp). Transactional data was only migrated, if it was needed for legal reasons, such as tax regulations.

Additionally, also some of BiotechComp’s business processes, which were not covered by ChemicalCorp standards, had to be defined on the platform. The process migration covered “a part of the business that [ChemicalCorp] did not utilize before” (BIM - ChemicalCorp). For that matter, the SAP system’s Business Process Engine allowed the team to define new processes rapidly. This saved time as well as cost of the project and kept the system flexible for future modifications or updates.

Technical infrastructure components, such as desktop computers and network connections, were rolled out in the acquisition in collaboration with retained IT personnel. Since all components are standardized and provisioned by one global provider, their connection to enable communication was not an issue.

Although the scalability of ChemicalCorp’s ERP platform is a necessary requirement that needs to be managed in general, the concrete integration was “just [about] rolling out that infrastructure to a new building, to a new site, and that’s it [...] it’s

more based upon how your back-office is handling the performance of the system and enhancing it to be utilized at its high peak” (BIM - ChemicalCorp). In this context, the inherent fragmentation of SAP systems into a three-tier architecture does enable the IT experts at the ChemicalCorp to manage system scalability centrally.

When technical integration was completed four weeks prior to go-live, the systems were tested in parallel to the legacy systems and measured against ChemicalCorp’s internal ‘report card’ approach to ensure platform robustness. Also, beta testing gave system users the chance to understand and internalize system functionality.

When the system finally went live country by country, dedicated staff was available on site for the subsequent two months to provide effective change management. According to the report card measurement, the integration project was remarkably successful in terms of business continuity. Worldwide, only two customer deliveries were not being shipped. The integration was delivered in the architectural to-be state three months ahead of schedule and did not produce any misalignments that limited the division ex-post or required subsequent consolidation efforts. Two months later, the integration team retreated and let the business run by itself.

Eventually, the BIM reveals that “having this [stable structure] in place with the processes and the business units on one platform [...] allows us to integrate acquisition businesses a lot easier because the processes are already there. [...] And from that aspect, I think it makes it very easy to onboard a company nowadays”.

5.2 EngineeringCompA

EngineeringCompA is a large European conglomerate with main business activities in civil and industrial engineering, but an overall highly diversified business portfolio. Since the company targets customers in both, the B2B and the consumer market, in a variety of different industries, business segments are grouped in divisions that act as holdings for the individual subdivisions. Although their industries might differ tremendously, the majority pursues customer intimacy strategies. Hence, products are created in close collaboration with customers and to a large extent in on-site projects. In close alignment with the divisional governance structure, EngineeringCompA’s IT governance is set up in a hybrid mode. Consequently, some global systems, such as email or financial reporting, are standardized across the company and provided by corporate IT. Other solutions, such as managerial reporting systems, are delivered from local entities. Some divisions maintain local ERP systems, while others are using one of several centralized platforms.

Particularly as of the turn of the millennium the conglomerate embarked on an intensive growth-by-acquisition strategy purchasing several companies per year. Yet, the levels, to which acquired targets have been integrated into the company, have differed tremendously in distinct cases. According to process heterogeneity, acquisition size, acquisition geography, and market volatility, a full integration is not always expedient for EngineeringCompA. Nevertheless, some of the past decisions to refrain from integration have also suffered from inappropriate diagnosis and overly generous concessions to acquisition targets’ management.

Consequently, EngineeringCompA's Chief Information Officer (CIO) underlines that "there is not one EA. It's good to have one, [...] to have this target system", but in reality, the conglomerate possesses several EAs at different levels. Processes are only to a very low degree standardized and integrated throughout the entire company. Also, the existence of hundreds of legal entities with individual ERP systems has created 'data silos' around the world. Some administrative processes are standardized on global platforms, but most IT is heterogeneously provided at the local level.

On the level of individual business divisions, by contrast, the pictures can differ tremendously from each other. Here, processes are more similar and higher degrees of standardization and integration might be desirable. Whereas some divisions run standardized and integrated processes on global platforms, others exist in holding structures with little degrees of process standardization.

By the end of 2012, one of the architecturally more immature business divisions was EngineeringCompA's legacy water technology segment. The business area was focused on the production of water as well as waste treatment technologies and had grown through a previous acquisition some years earlier. The division's operations mostly took place in projects in close collaboration with customers and the segment's legal entity structure equally implied partitioned ERP systems of different units.

During the corporate growth-by-acquisition strategy, EngineeringCompA decided to acquire WaterTechCompA to increase net income. Additionally, the acquisition should generate synergies in the form of economies of scope in production technology as well as economies of scale through the access to new customers in untapped geographical markets. The need for full integration to reap these synergies became evident early and a completely new water technology division was formed.

According to a Senior Enterprise Architect (SEA) in EngineeringCompA however, the acquisition "was mostly a production company" and "[EngineeringCompA] had no experience and no business with the production modules. [...] The order from the customer [was] always really a customer-related, specific order and one piece [did] not match the next one piece. So we [did] not have serious production here." Consequently, neither the acquirer's nor the acquisition's existing ERP systems could be scaled to the entire division. A Renewal strategy was the only option to harmonize all processes of the new water technology division on one global ERP platform.

Once this decision was made, the actual challenges of strategy implementation did not differ greatly from the ones of a common ERP introduction. The main difficulties arose from defining new harmonized processes and managing the change. Additionally, infrastructure rollout, data migration, and system customizations were to be completed. The SEA explains: "When we decided to integrate the whole company on one ERP system, then we also decided to harmonize all the processes. [...] From the beginning on, we had both parties in workshops in here to create a common template for both." In this context, the main challenge was to bring people from different countries together, manage cultural differences, and make them agree on common business processes. After the template had been elaborated, the technical implementation of the system was comparatively straightforward. An SAP ERP platform was selected, business-specific templates from a consultant company were used and mildly customized to the target state that had been defined.

The platform first went live in the acquisition and subsequently in all existing water technology sites of the acquirer. During the rollouts, existing infrastructure components, were reused as much as possible, while some hardware components needed to be added to connect sites to the new parent company's infrastructure. The continuous adding of new users and legacy data to the SAP platform did not result in scalability issues. "[With] SAP, it doesn't really matter. Scalability is endless [because] the database [...] is fantastic." (CIO - EngineeringCompA).

Data migration solely required the definition of a standardized format in spreadsheets and data transformation was subsequently largely in the hands of the corresponding legal entities. Since legacy data was available in each ERP system's standardized format, data migration was largely seen as a commodity service.

Eventually, "the biggest [challenge] was change management – to get all people to understand each other, to work together [and] to really accept and use the system, this is far more difficult" (SEA - EngineeringCompA). Change management was an ever-ongoing process that started with managing cultural and site-specific differences during process definition, included setting up divisional support structures for go-live, and reached far beyond system rollout.

One year after the first rollout in the acquisition, the last site was brought onto the new platform successfully, finishing the integration project within budget and on time. The Renewal integration did not produce any misalignments or leftovers that had to be fixed in subsequent consolidation projects. Correspondingly, the CIO praises the project success: "We managed in time and budget to create this SAP system, migrate first of all the newly acquired [...] entities into the SAP system, and then afterwards all the old [...] companies in the same division. So that is the, I think, ideal approach: You have something that you acquired, you look at it [...], make the decision – architectural wise – [to] create something new [...], and also migrate the older legacy company to that. And it went perfectly well".

5.3 FinancialBankA

FinancialBankA is a large Danish bank that offers financial products in retail, private, and corporate banking in several European countries. The bank's IT organization consists of three main organs. Whereas the internal IT department supplies IT services, IT operations, infrastructure, and a large extent of applications development are outsourced to two partially owned external providers.

In the 20th century, FinancialBankA has grown equally through organic growth and external M&A, which mostly targeted the access to new customers by purchasing banks with existing compounds of branch offices.

By the beginning of 2014, FinancialBankA was following a Unification operating model. Business processes were accordingly standardized and integrated to a large degree throughout the company. FinancialBankA's core banking system is a legacy mainframe system that implements all common daily banking processes, transactions, as well as products. The system is provided by one of the partially owned external vendors and used by multiple of its customers. Individual differences in requirements are mostly handled through parameters of corresponding software modules. Thereby,

the system gains some limited flexibility to change products and processes without altering its source code. FinancialBankA's self-developed applications reuse the core system and enable strategic differentiation.

The bank "has a long tradition for integration" (IT Architect - FinancialBankA) and has created several standardized mechanisms to allow for data exchange between its system components. For that purpose, the core banking system has been wrapped into several layers to provide different technology-independent services in application programming interfaces (APIs) to the outside while encapsulating core functionality. These integration mechanisms and the adherence to the Single Responsibility principle [24] enable high degrees of business process standardization and integration. By providing different levels of service interfaces, FinancialBankA is targeting a SOA, but the core banking system itself is a pure monolith. Furthermore, the use of a business process engine is planned, but not adopted yet.

By the beginning of 2014, FinancialBankA acquired KreditBankB to officially complete a merger that both parties had agreed on in advance. On the one hand, FinancialBankA could complete its product portfolio with mortgage loans. On the other hand, KreditBankB could broaden its sales channels by gaining access to an extensive branch network. Moreover, the deal aimed for cross-selling opportunities, risk spreading from diversification and cost synergies from consolidation.

Except for a small retail bank, which made up five to ten percent of KreditBankB's business, both product portfolios were almost perfectly complementary and business processes heterogeneous. Given these differences, a partial Co-Existence strategy was chosen. The small retail bank was fully absorbed into FinancialBankA, KreditBankB's mortgage loan business was kept as a separate brand and an IT consolidation was launched to reduce system redundancies between the two entities.

The Absorption of the retail bank's IT systems was relatively straightforward to implement. An IT Architect explains: "It was the same approach we're using when we acquire a bank. [...] Either they're on the same core banking system [of the external supplier] or they're on one of the other two or three core banking operators. And then we set up a minor project to move their data and their whole customer portfolio. [...] It's a quiet normal procedure". As most Danish banks have outsourced their core banking systems to one of three IT operators, the data schemes are known and "these three bank centrals are quiet good at that. [...] Moving banks in-between these three centrals is [...] being done several times a year".

Even though system scalability was not an issue in the context of the Absorption, it is a necessary precondition and the main reason, why banks are still using legacy mainframe systems nowadays. For FinancialBankA, the separation of the entire architecture into several tiers enables scalability by allowing for the targeted addition of appropriate resources at the corresponding tier and the implementation of request optimization mechanisms, such as load balancing or resource pooling.

The major implementation challenges from leaving KreditBankB's mortgage loan business in Co-Existence, by contrast, emerged from the merger's initial goals. To be able to sell each other's products and identify cross-selling opportunities, business processes, applications and data from the two parties needed to be connected.

This process benefited tremendously from the pre-existence of web service interfaces in both institutions to expose functionality to other applications. A key

component was FinancialBankA's integration platform. "It's a Java application facing our core system from all our applications. [...] It's kind of an integration [Enterprise Service Bus]-like architecture. And [KreditBankB's systems] are accessing this [...] platform" (IT Architect - FinancialBankA). The integration platform adds a layer of abstraction above all services and unifies interfaces for internal and external reuse.

As these mechanisms facilitated integration efforts, the more demanding challenges of integration for FinancialBankA were subsequently business-critical security requirements of the financial industry. The IT Architect explains that "having user authentication or authorization is actually quite complex when you merge two organizations". Again, FinancialBankA could draw on previous experience to implement a certificate-based approach to establish trust between distinct systems.

While consolidation projects are still ongoing nowadays, the IT integration is considered a success. Although the achievement is not measured in any metrics, the bank's IT Director is satisfied with the progress so far. "We could have gone even further, but [...] we are where we're supposed to be. So I would call it a success." By consolidating IT operations and systems, the new financial institution could already realize IT-based cost synergies, while avoiding disruptions to daily business operations. However, some ex-post misalignment exists and a lot of potential for synergies through consolidation of processes as well as functions remains.

6 Analysis

The three cases provide evidence for how the constituent resources and capabilities of distinct EA maturity stages enable a company's PMITI implementation capabilities.

For once, the acquisition of WaterTechCompA by EngineeringCompA illustrates an acquirer in the Standardized Technology maturity stage that was forced by its EA immaturity to embark on a Renewal strategy to integration. After closing, the legally unified company aimed for a Unification operating model, which required complete integration of the acquisition. However, business processes were neither standardized nor integrated throughout the division, data was embedded in local ERP systems, and technology was only standardized to a limited extent. The division was therefore in the lower areas of the Standardized Technology stage. This immaturity impeded the adoption of any path-dependent strategy and forced the division to embark on a Renewal strategy. The case justifies the first proposition of our theoretical model:

Proposition 1: Companies or business units in either the Business Silos architecture stage or the Standardized Technology architecture stage do not possess an adequate EA to enable the implementation of any path-dependent PMITI strategy. They are therefore forced to conduct a Renewal strategy in order to achieve acquisition benefits and sustain strategic IT alignment.

Moving on, the merger between FinancialBankA and KreditBankB exposes how a company in the Optimized Core stage was enabled by its mature EA to implement a partial Co-Existence strategy successfully.

Prior to the merger, FinancialBankA's processes were highly standardized as well as integrated. Moreover, the bank's EA exhibited limited degrees of flexibility by

allowing for core system modifications through parameter substantiation. Its EA was therefore located in the upper areas of the Optimized Core stage.

During the Absorption of KreditBankB's bank, FinancialBankA's EA largely had to support data migration, which was highly facilitated by having core banking outsourced to a provider that guides industry standards and interoperability. If data and processes had not been standardized on a central, scalable platform, migration would have been a lot costlier and may have forced FinancialBankA into a Renewal.

During the implementation of the Co-Existence with KreditBankB's mortgage loan business, FinancialBankA's main challenges resolved around application and data integration. When connecting applications from KreditBankB, FinancialBankA highly benefited from pre-existing integration, because appropriate components, such as the integration platform, were already in place to provide technology-independent interfaces that could be applied for the creation of connections to the merging partner. In combination with standardized and integrated business processes, the existence of such "interfaces to critical corporate data" [15, p. 76] constitute the Optimized Core architecture stage. The merger case therefore justifies Proposition 2:

Proposition 2: Companies or business units in the Optimized Core architecture stage possess an adequate EA to enable the implementation of the Absorption as well as the Co-Existence strategy during PMITI. Thereby, they are in the position to achieve acquisition benefits while sustaining strategic IT alignment.

Eventually, ChemicalCorp's acquisition of BiotechComp elucidates the enablement of a successful Best-of-Breed strategy by the Business Modularity stage.

ChemicalCorp follows a Unification operating model and the company's processes are largely standardized as well as integrated on an advanced ERP platform, which follows a SOA and implements a Business Process Engine. This enables the company to reconfigure and reuse business processes without the need for source code customizations and places the company's EA in the Business Modularity stage.

The challenges faced during the integration of BiotechComp were data migration, process migration, system rollout, and change management. While effective data migration was critical to the realization of acquisition benefits, ChemicalCorp's standardized data scheme clearly enabled the acquirer to succeed. Platform scalability [c.f. 12] did not become an issue during the integration, but is seen as a precondition for system rollout. Having a scalable platform of standardized and integrated business processes in place clearly enabled the acquirer to roll these out in the acquisition.

While these challenges could have been equally overcome by a company in the Optimized Core stage, it is the process migration requirement that underlines the value added by Business Modularity: The agility to onboard new business processes from BiotechComp by modelling them in a Business Process Engine, reusing existing system components and only introducing low-level functionality if it is an absolute novelty. This capability enables ChemicalCorp to avoid costly source code modifications and keeps the platform flexible for future changes. Companies without this ability may also be able to conduct a Best-of-Breed strategy, but the implementation will be costlier or result in increasing platform complexity as well as misalignment. Particularly serial acquirers would eventually face a situation of excessive platform complexity that requires consolidation. We therefore conclude Propositions 3 and 4:

Proposition 3: Companies or business units in the Optimized Core architecture stage do not possess an adequate EA to enable the implementation of the Best-of-Breed strategy during PMITI without suffering deficiencies in acquisition benefits or the emergence of ex post strategic IT misalignment.

Proposition 4: Companies or business units in the Business Modularity architecture stage possess an adequate EA to enable the implementation of all four PMITI strategies and subsequently achieve acquisition benefits while sustaining strategic IT alignment.

7 Conclusion

The case evidence and our theoretical model reveal how higher levels of EA maturity enable companies during the implementation of distinct PMITI strategies. By elaborating in detail, how a mature EA endows a company to overcome architectural integration challenges during PMITI, we substantiate our claim that the existing EA of a company is part of its PMITI implementation capabilities and shapes its capacity to implement the four integration strategies. This reasoning also shows how EA management and EA maturity create strategic value in the context of M&A.

The case evidence explains on a great level of detail how distinct EA maturity stages are implemented and how they afford a company to overcome the challenges that are inherent in the four PMITI strategies. The implication for practitioners is that companies should prepare their EA to become ready for intended PMITI strategies and select appropriate strategies according to the prevalent level of EA maturity. The developed theory additionally exposes that the desirable degree of PMI eventually depends on the choice of operating model and underlines the strategic importance of this decision.

Naturally, this paper is subject to several limitations. Firstly, conclusions are drawn based on case evidence that has largely been collected using the interview method. Although the threats to validity and reliability are addressed during the research process, internal and external validity remain disputable due to selection bias and method bias [25]. Particularly acquisition success is an ambiguous concept and key informants pose the threat of rendering project success in a biased way. Secondly, the propositions are based on merely three cases. Future research should collect concrete evidence to support the claims and foster validity. In this context, investigations on acquisition failures should contribute analyses of what went wrong. Finally, this study embarks on a qualitative research approach to examine the phenomena under consideration in greater detail. This should be complemented by quantitative research to examine the validity of the model.

References

1. Thomson Reuters: Mergers & Acquisitions Review - Financial Advisors - Full Year 2015 (2016). [http://share.thomsonreuters.com/general/PR/MA-4Q15-\(E\).pdf](http://share.thomsonreuters.com/general/PR/MA-4Q15-(E).pdf)
2. Grant, R.M.: Contemporary Strategy Analysis: Text and Cases Edition. Wiley, Hoboken (2016)

3. Deloitte: M&A trends report 2014 (2014)
4. Weber, Y.: *A Comprehensive Guide to Mergers & Acquisitions: Managing the Critical Success Factors Across Every Stage of the M&A Process*. FT Press, Upper Saddle River (2013)
5. El Sawy, O.A.: The IS Core IX: The 3 faces of IS identity: connection, immersion, and fusion. *Commun. Assoc. Inf. Syst.* **12**, 39 (2003)
6. Sarrazin, H., West, A.: Understanding the strategic value of IT in M&A. *McKinsey Q.* **12**, 1–6 (2011)
7. Bank, D.: Press Release - Decline in profit due to integration expenses (2008)
8. Deloitte: *Integration report 2015 - Putting the pieces together* (2015)
9. Wijnhoven, F., Spil, T., Stegwee, R., Fa, R.T.A.: Post-merger IT integration strategies: an IT alignment perspective. *J. Strateg. Inf. Syst.* **15**, 5–28 (2006)
10. Henningsson, S., Yetton, P.: Post-acquisition IT integration: the sequential effects in growth-by-acquisition programs. In: *24th Australasian Conference on Information Systems (ACIS 2014)* (2013)
11. Henningsson, S., Yetton, P.: *Towards a Theory of Post-Acquisition IT Integration (Working Paper)* (2016)
12. Tanriverdi, H., Uysal, V.B.: Cross-business information technology integration and acquirer value creation in corporate mergers and acquisitions. *Inf. Syst. Res.* **22**, 703–720 (2011)
13. Benitez-Amado, J., Ray, G.: Introducing IT-enabled business flexibility and IT integration in the acquirer's M&A performance equation. In: *Proceedings of the 33rd International Conference on Information Systems (ICIS 2012)* (2012)
14. Toppenberg, G., Henningsson, S., Shanks, G.: How Cisco Systems used enterprise architecture capability to sustain acquisition-based growth. *MIS Q. Exec.* **14**(4), 151–168 (2015)
15. Ross, J.W., Weill, P., Robertson, D.: *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*. Harvard Business Press, Brighton (2006)
16. Gregor, S.: The nature of theory in information systems. *MIS Q.* **30**, 611–642 (2006)
17. Henningsson, S., Carlsson, S.: The DySIIM model for managing IS integration in mergers and acquisitions. *Inf. Syst. J.* **21**, 441–476 (2011)
18. Haspeslagh, P.C., Jemison, D.B.: *Managing Acquisitions: CREATING Value Through Corporate Renewal*. Free Press, New York (1991)
19. Robbins, S.S., Stylianou, A.C.: Post-merger systems integration: the impact on IS capabilities. *Inf. Manag.* **36**, 205–212 (1999)
20. Henningsson, S., Yetton, P.: Managing the IT integration of acquisitions by multi-business organizations. In: *Proceedings of the 32nd International Conference on Information Systems (ICIS 2011)* (2011)
21. Yin, R.K.: *Case Study Research Design and Methods*. Sage, Thousand Oaks (2009)
22. Dubé, L., Paré, G.: Rigor in information systems positivist case research: current practices, trends, and recommendations. *MIS Q.* **27**(4), 597–636 (2003)
23. Ritchie, J., Lewis, J., Nicholls, C.M., Ormston, R.: *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. Sage, Thousand Oaks (2013)
24. Martin, R.C.: *Agile Software Development: Principles, Patterns, and Practices*. Prentice Hall PTR, Upper Saddle River (2003)
25. Yin, R.K.: *Case Study Research: Design and Methods*. Sage publications, Thousand Oaks (2013)



<http://www.springer.com/978-3-319-64929-0>

Perspectives in Business Informatics Research
16th International Conference, BIR 2017, Copenhagen,
Denmark, August 28–30, 2017, Proceedings
Johannsen, B.; Møller, C.; Chaudhuri, A.; Sudzina, F.
(Eds.)
2017, XVIII, 279 p. 75 illus., Softcover
ISBN: 978-3-319-64929-0