UNDERSTANDING IT TRANSFORMATION – AN EXPLORATIVE STUDY

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UNDERSTANDING IT TRANSFORMATION –
AN EXPLORATIVE STUDY

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Abstract

Information technology has become a critical factor for enterprises of all sizes. However, after years of increasing business process digitisation, companies face various challenges: On the one hand, the number of information systems and the intensity of their use have significantly increased, and the IT landscape’s inherent complexity requires a great deal of effort to change the existing information systems; on the other hand, companies are forced to continuously adapt to the fast-paced business environment and realise that their IT landscapes can no longer cope with the current and future business requirements. As IT is increasingly regarded as a hindering factor, companies launch IT transformation initiatives to overcome the dilemma of their overly complex IT landscapes.

The purpose of this article is to investigate the nature and characteristics of IT transformation. Using the resource-based view as a theoretical lens, we suggest conceptualising IT transformation as a fundamental IT capability and resource change. On the basis of three case studies, we analyse the changes in IT capabilities and resources in the course of IT transformation and explore their interplay with business capabilities. Our empirical results confirm the nature of IT transformation as a second-order change affecting technological and human IT resources’ ‘deep-structure’. From our cross-case analysis, we identify a set of technological IT capabilities induced by IT transformation as well as dynamic human IT capabilities required to manage this set’s reconfiguration.

Keywords: IT Transformation, Business Capabilities, IT Capabilities, Business IT Alignment, Resource-based View, Case Study.
1 Motivation

Information technology has become a critical factor for enterprises of all sizes. However, after years of increasing digitisation of business processes, many companies face the challenge that their IT landscapes can no longer cope with the current and future business requirements (Hofmann, 2007; Pagel, 2009; Laszlo, 2010). Firstly, the number of information systems and the intensity of their use as well as their interdependencies have increased; IT landscapes have therefore become increasingly complex to manage and difficult to change. Secondly, companies operate in changing business environments and have to continuously adjust their business models and business processes. IT is increasingly regarded as a hindering factor in realising these adjustments, since changes to the existing information systems are not completed within reasonable timeframes and budgets. To overcome this dilemma, companies transform their IT with the aim of fundamentally restructuring their IT landscapes.

This motivates our research goal, which is to improve our understanding of IT transformation. Using the resource-based view (RBV) (Wernerfelt, 1984; Barney, 1991; Mata et al., 1995) as a theoretical lens, we focus on the following research questions:

- Which IT resources and IT capabilities do companies adjust during IT transformation?
- How do these changes affect the interplay between business and IT capabilities?

Given the explorative nature of our study, we chose a case study research design that analyses qualitative data (Benbasat et al., 1987; Lyytinen, 1987; Gregor, 2006). This design has been recommended for understanding the complex interactions between technology and organisations.

The remainder of the paper is structured as follows: We first review the current state of research and clarify the nature and characteristics of transformation. We then suggest a framework which conceptualises IT transformation based on the resource-based view. Subsequently, our research methodology is described, followed by an introduction of the cases. Finally, we present the findings of our within and cross-case analyses and close with a short conclusion and summary.

2 Prior Research

2.1 Nature and Characteristics of Transformation

‘When change is radical, they [companies and industries] must manage a metamorphosis by way of transformation.’ (Perrott, 2008, p. 63)

Studies of transformation are rooted in IS and management literature. Transformation is regarded as a change process and associated with radical change (Eriksen, 2008; Perrott, 2008). It complements the ‘incremental evolutionary’ change (first-order change), which is a change within an existing system. Transformation characterises the more ‘fundamental revolutionary’ change (second-order change) of the system itself and is also denoted as structural, radical or revolutionary change. The aim of transformation is adaption to a changing environment. Internal and external discontinuity and instability are typical triggers for such an adaption (Gioia and Chittipeddi, 1991, p. 434; Weitzel and Had, 2001) deep-structure guarantees stability. This causes that minor changes can be easily performed, while radical transformations are difficult to realise. Therefore ‘compact revolutions’ (Gersick, 1991) are the ‘most common mode for transformations’ (Romanelli and Tushman, 1994, p. 1162). Consequently, phases of upheaval (revolutionary change) and phases of adjustment (evolutionary change) alternate (Greenwood and Hinings, 1996, p. 1024).

Transformation can be linked to the numerous studies that explain change in general (Donaldson, 1984; Greenwood and Hinings, 1996) or from an IS-specific perspective (Siggelkow, 2001; Lyytinen and Newman, 2008; Marks, 2008).
## 2.2 The Role of IT in Change and Transformation

IT can have an ambivalent role in change processes, as (Robey and Boudreau, 1999, p. 181) point out: It can support the forces of either persistence or transformation, or both simultaneously. IS research emphasises the role of information technology as an enabler of strategic or organisational change (Manzoni and Angehrn, 1997; Tillquist, 2000). As Tillquist (2000, p. 116) points out, ‘IT-enabled organizational change is the explicit forwarding of information technology for the purpose of enabling organizational change’ (Tillquist, 2000, p. 116). Hence, IT use can induce organisational change (Devadoss and Pan, 2007), but may also be the source of strategic change, thereby affecting a company’s competitive positioning (Hsiao and Ormerod, 1998). To summarise, IT-enabled change is always multi-level, since IT as a system is embedded in a larger organisational system (Lyytinen and Newman, 2008). In fact, these changes’ constant interactions create multilayered, staggered, and cascading changes across both systems.

### 3 Conceptual Framework

Drawing on the existing literature (Lyytinen and Newman, 2008, p. 598ff), we characterise IT transformation as a multi-level, punctuated and episodic change initiative that initiates changes in the IT landscape and organisation’s ‘deep structure’. Since describing the scope and content of large transformations is often challenging, we suggest a conceptual framework that builds on the resource-based view and conceptualises IT transformation as a fundamental change in the IT capabilities and resources.

The RBV was applied in management literature in the 1980s to emphasise strategic management’s ‘inside-out perspective’ (Wernerfelt, 1984; Barney, 1991). Although the RBV has in the interim been challenged (Penrose, 1968; Priem and Butler, 2001), it is broadly accepted and regularly used in IS research (e.g. Ciborra and Andreu, 1998; Brush and Artz, 1999; Bharadwaj, 2000; Melville et al., 2004). Two research streams have been established within the broad RBV field. The resource-picking stream focuses on the selection of valuable resources, whereas the capability-building stream explains economic rents through resources’ appropriate application. Capabilities arise from the combination of physical, human and technological resources and describe a company’s the capacity to perform specific tasks (Ravichandran and Lertwongsatien, 2005). Grant (1991, p. 120) argues that a ‘capability is what a firm can do’ and considers a bundle of resources as the origin of capabilities. However, it is important to note that companies employ capabilities out of different business functions (Schmid and Schurig, 2003). Consequently, El Sawy and Pavlou (2008) maintain that companies employ IT capabilities to improve their business capabilities. Thus, we conclude that IT transformation is a fundamental change in the IT resources and capabilities with the objective to strengthen business capability support.

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1 El Sawy and Pavlou (2008) refer to IT capabilities as IT infrastructure capabilities.
Our conceptual model builds on the assumption that a capability itself can be the origin of other capabilities. This leads to ‘a hierarchy of capabilities where more general, broadly defined capabilities are formed from the integration of more specialized capabilities’ (Grant, 2005, p. 148), or, from a broader perspective, ‘Organizations are faced with a resource comprised of a […] network that makes an unknown amount of contribution to a capability that may itself be a member of a network of capabilities’ (Black and Boal, 1994, p. 135).

Applied to our conceptual model, the ‘hierarchy of capabilities’ starts with business capabilities at the top level, as depicted in Figure 1. Business capabilities are the source of competitive advantage and are valuable, rare and hard-to-imitate (Barney, 2001; Makadok, 2001). As higher, integrated capabilities (Black and Boal, 1994; Grant, 2005), business capabilities are formed through the integration of more specialised capabilities, among them IT capabilities. For the further refinement of IT capabilities, we rely on the vast body of literature that has broadly defined and categorised resources and capabilities (Lall, 1992; Sabherwal and Kirs, 1994; Mata et al., 1995; Bharadwaj, 2000; Melville et al., 2004; Langdon, 2006). In accordance with Bharadwaj (2000), we distinguish two types of IT resources and corresponding capabilities in our conceptual model:

- **Technological IT capabilities** (sometimes also denoted as IT infrastructure capabilities) arise from the physical IT resources that form the IT landscape. They include applications, databases, as well as integration and infrastructure components. These resources show a high degree of deterministic behaviour (Grant, 1991).

- **Human IT capabilities** describe the training, experience, relationships and insights of employees. Managerial and technical IT skills are considered as particularly critical, since they evolve from accumulated experience. They are complemented by organisational routines, which describe the regular and predictable patterns allowing coordinated activities within the organisation.

Capabilities are not a static company characteristic, but are in general subject to change over time. According to Helfat and Peteraf (2003), capabilities arise over time and, after a certain selection event, companies have to decide whether to maintain the existing capability, remove or extend it. IT transformation is therefore associated with the IT capability’s lifecycle development.

![Figure 1: Hierarchy of Capabilities](image)

4 Research Design

4.1 Research Methodology

Our primary research goal is to gain an understanding of IT transformation. Thereby, according to Gregor (2006, p. 622ff), our research can be classified as a ‘Theory of Analysis (Type I)’. She recommends case study research, which is particularly useful in situations in which a contemporary phenomenon is studied in its natural context (Benbasat et al., 1987). We chose multiple-case studies,
since the knowledge gained from replicated case studies is usually considered to increase the findings’ external validity (Dubé and Paré, 2003; Yin, 2003). Since qualitative research in general and case study research in specific have been criticised for their lack of rigor, we closely followed Yin’s (2003) and Darke’s (1998) guidelines on how to build theory from case study research to ensure this study’s validity.

4.2 Case Selection

Given the difficulties encountered accessing company-internal information, our selection of cases is a convenience sample based on a theoretical pre-selection (Eisenhardt, 1989). We pre-selected three information-intensive industries, notably telecommunications, financial services and logistics, as the focus areas of our research. Our choice was based on the following reasoning: Firstly, companies in these industries are highly dependent on their IT assets, which we assume increase the pressure on IT capabilities and their fit with business capabilities. Secondly, information-intensive industries are more mature regarding the leveraging of IT assets than other industries are. In order to identify candidates with IT transformation experience, we scanned IT magazines – such as the CIO magazine – of the last five years. Furthermore, we complemented this search with our personal networks. The result was a long-list of 34 companies. In order to generate a short-list, we requested interviews with the IT managers in charge of IT transformation within these companies. As soon as we had found suitable informants from one industry, we stopped requesting in that segment. In total, we extracted one company per industry, using between one and two interviewees.

4.3 Data Collection

While our research data were gathered primarily from interviews, we followed Yin’s (2003) recommendations and included data from additional sources to ensure comprehensiveness and allow for triangulation. We used internal presentations that the interviewees provided, presentations at IT conferences as well as publicly available annual reports and IT magazine articles as additional sources. Two interviewers conducted the interviews with the key informants (Segars and Grover, 1998; Yin, 2003). During a 15-minute pre-call with each interviewee, we explained the purpose of our study and clarified the interview’s focus. The subsequent interview was semi-structured according to our analysis framework and took between 90 and 120 minutes. The interview data, public documentation and company-provided internal reports were consolidated into one case write-up per company. In doing so, we assured construct validity through multiple sources of evidence and an extensive approval process. In the course of the data collection, a 15-minute follow-up-call was scheduled with all interviewees to clarify open issues and correct misunderstandings. After processing the information of the follow-up calls, the case write-up was resent to the interviewees for approval regarding the correctness and completeness of the data.

4.4 Data Analysis

Data analysis started with the coding of the final case write-ups according to the conceptual model in Figure 1. Two researchers coded the write-up independently to increase inter-rater reliability. They documented their coding with ATLAS.ti software. In the second step, the codes were compared and accepted, if there was agreement. The coders’ differences were resolved during joint discussions. Finally, the extended research team of three researchers cross-checked the final coding. During the within-case analysis (Eisenhardt, 1989, p. 593f), we analysed the codes and the changes of business and IT capabilities over time by comparing the initial state (prior to the IT transformation) and the contextual IT transformation factors. The result was a comprehensive network of different business and IT capabilities for each case study. The cross-case analysis (Eisenhardt, 1989, p. 594f) implied a detailed search for the similarities and differences between the three cases. The patterns we found were considered promising elements of IT transformation.
5 Case Description

The following section provides a short overview of IT transformation in the three case studies. A summary of the companies as well as the context of their IT transformation is displayed in Table 2.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>35,470 MEUR</td>
<td>307 MEUR</td>
<td>10,870 MEUR</td>
</tr>
<tr>
<td>Headcount</td>
<td>198,006</td>
<td>1,540</td>
<td>40,254</td>
</tr>
<tr>
<td>Transformation goal</td>
<td>Lean and agile Telco</td>
<td>The IT landscape’s increased stability and performance</td>
<td>Cost reduction, customer intimacy, end-to-end business process transparency</td>
</tr>
<tr>
<td>ITT Trigger</td>
<td>New group strategy with the goal to closer integrate the formerly independent business units</td>
<td>New CIO joins the financial services company with the mandate to prepare IT landscape and organization for the future</td>
<td>New customer-oriented group strategy</td>
</tr>
</tbody>
</table>

Table 2: Case overview

5.1 Case A

Company A is a telecom service provider offering wire bound and wireless Internet services to the European and North American markets through its national and product-oriented subsidiaries. Operating in the fast-paced telecommunication market, company A has a long history of business and IT transformations. In the late 1990s, its wire bound core business already operated in a small margin market, while the markets for mobile and Internet services were experiencing dynamic growth. To counter deregulation of the market and its decreasing margins in the mobile and Internet market, both of which were already looming, Company A’s mobile division started a major transformation initiative focussing on its national unit. The subsequent transformation phases started in mid-2000, when the company was attempting to increasingly leverage the synergies between their independent units and the different wire bound and wireless services. In 2009, the group underwent another major strategic shift, aiming to transform itself into a ‘lean and agile’ telecommunications company. In today’s business strategy, IT is an essential factor in realising a customer-value driven market approach to connect people by means of all channels and to provide value added services and content. Company A intends to strengthen its IT capabilities with regard to offering marketable product within very short time frames and in collaboration with external partners. Additional IT capabilities are required to allow the automation and standardisation of its business processes and to work with small margins in a mass market. In 2009, Company A started two separate, but interrelated, transformation programmes. One is the technology-oriented next generation IT (NG-IT) programme, the other the organisational-oriented ‘one-IT’ programme. Not only do the savings realised through the NG-IT fund the one-IT programme, but one-IT prepares the IT organisation for the changes implemented through the NG-IT. The NG-IT programme is subdivided into 10 streams to reorganise different core applications and provide the group with a common technology platform. The NG-IT programme changed company A’s self-perception fundamentally. From an invention company that regarded its excellent development skills as its core competence, company A evolved into an integration company that bundles services provided by different parties for the customer. In terms of IT, this implies the use out-of-the-box software and standard technology from different vendors for integrated, flexible, and cost efficient solutions with a better time-to-market.

2 Revenue and headcount according to the annual report in the year the IT transformation started.
5.2 Case B

Company B is a financial specialist offering a broad portfolio of leasing, factoring, and credit products to private customers, small and medium sized enterprises. It has subsidiaries in Central and Eastern Europe and depends on a distribution network of external sales agents such as car dealer and bank branches. IT transformation started in 2005 when the board of management decided to enlarge the product portfolio and to offer credit products in addition to leasing contracts. While this decision had significant implications for the core business applications, the board also decided to consolidate the decentralized IT operations in a centralized shared IT service center. Consequently, a new Group CIO was appointed with the mandate to prepare the IT landscape and organization for the future. At that time, company B faced increasing system instability; a system breakdown of several working days was common during new releases’ roll-out. Furthermore, IT projects were not completed within time and budget. In addition, the IT systems had to support the expanded product portfolio, and the online sales platforms had to be redesigned as competitive tools. In order to support the new business strategy, the CIO started with the transformation of the IT organisation and implemented a reliable project portfolio management process. After this organisational stream had delivered its first achievements, a parallel technical transformation stream was started. During this stream, company B modernised its core business application and established a company-wide address management with SAP R/3 BP. It also introduced a ticketing system as a workflow management system for the contract processing and a webMethods based integration platform.

5.3 Case C

Company C is a European logistics provider with worldwide operations. In view of market liberation and the increasing pressure on its margins, it set up a 10-year business transformation programme. The latter pursues three strategic targets: cost reduction, customer intimacy and end-to-end process transparency. A number of strategic projects form the business transformation program, one of them is a dedicated IT transformation program. The latter has a planned duration of 5 years and aims at improving three major IT capabilities with which to realize its vision, namely to provide reliable data, reduce time-to-market, and measure and manage the business.

Regarding the IT transformation initiative, Company C’s first project was to clean up the existing data landscape. Data managers were appointed, and canonical data models and messages were defined for application integration. In a next step, company C implemented an integration backbone based on webMethods technology. This measure is considered an important enabler of the application landscape consolidation, which will reduce the existing 1000 applications to about 100. Company C integrated model transformation into the development process by means of ARIS. Simultaneously, the demand management process and IT governance were redesigned. Company C undertook numerous adjustments of the IT organisation. New competence centres have also been established to support regional development teams with technological know-how.

6 Analysis and Findings

We start our case analysis by examining the drivers and targets of IT transformation and continue by analysing the changes that IT transformation imposes on IT resources and capabilities. While all three companies operate in a very dynamic competitive environment and have margins that are under strong pressure, they have two internal drivers of IT transformation (see Figure 2). On the one hand, IT’s business criticality has increased significantly over the years. Consequently, all three companies report that IT has become an explicit element in their business strategies. In addition, the companies emphasise their business processes more. On the other hand, all three companies became aware that their current IT landscapes, spread over several international subsidiaries, had become inefficient and ineffective. Critical incidents, such as system instability and project failures, revealed the IT landscape’s structural deficiencies and its inability to meet future business requirements. Both internal
drivers – IT’s increasing business criticality and the IT landscape’s deficiencies – are symptoms of the misfit between the current IT capabilities and the required business capabilities.

The main targets pursued with IT transformations are strongly linked to the firms’ business capabilities. They fall into three categories, as illustrated in Figure 2: The first category relates to end-to-end business processes. Through IT transformation, companies aim at establishing end-to-end business support, thereby contributing to seamless process integration (instead of local process optimisation in single units). In addition, they increase process transparency and measurement. The second category comprises targets related to product innovation and the extension of product portfolios in order to maintain margins. All companies expected IT transformation to support their product strategy and contribute to reducing their products’ time-to-market. The third category comprises IT transformation’s sell-side targets. All the companies aimed at significantly improving their access to customers by enhancing their online sales channels and improving their customer insights by consolidating their customer information across the company.

Figure 2: IT transformation drivers and targets

We rely on the conceptual model presented in section 3 to assess the changes to IS capabilities brought about by IT transformation, and analyse the changes to the technological and human IT resources and capabilities. Table 3 presents the main changes experienced by companies A, B and C. From this table, we conclude that all categories of IT resources and capabilities were addressed during the IT transformation, which supports the assumption that the nature of IT transformation is ‘second-order change’, or change of the system itself. With regard to the changes to the technological IT capabilities, all the companies strongly emphasised regaining control over the complex IT landscape by restructuring their business applications. This implies modernising core applications as well as reducing the heterogeneity and number of applications with a strong focus on packaged applications and modularisation. They thereby strengthen their capability to provide cost-efficient and flexible functional support for business processes. Strategic investments are made to enhance the attractiveness of online channels and platforms, which directly support product sales and customer interactions. In the course of IT transformation, the professional management of company data is established as a capability. Master data (e.g., customer data, contract data, address data, and product data) are consolidated and central master data pools are implemented. Company-internal data standardisation may be supported by canonical data models and messages for data exchange to reduce the integration links’ complexity. Besides restructuring their applications and data, all the companies have strengthened their enterprise-wide process and data integration capabilities.
<table>
<thead>
<tr>
<th>IT capabilities</th>
<th>Case A</th>
<th>Case B</th>
<th>Case C</th>
<th>Organisational IT Resources and Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Replaced ERP, CRM, billing and service and support application with packaged software</td>
<td>Modernised core applications: Replaced accounting application with SAP R/3 FI/CO, extended leasing application for credit products, and established SAP R/3 BP as an address management application</td>
<td>Reduced application count by 90%</td>
<td>Structure changed with respect to shared enabler and solutions</td>
</tr>
<tr>
<td></td>
<td>Established shared enablers that provide services for the entire group</td>
<td>Established high sales platforms and partner front-ends, improved partner front-ends</td>
<td>Harmonised interfaces and business logic</td>
<td>Established IT governance department and competence centre</td>
</tr>
<tr>
<td></td>
<td>Introduced solutions as a combination application and business process</td>
<td></td>
<td>Replaced ERP system with SAP or Oracle solution (planned)</td>
<td>Still maintains local implementation units</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td>Introduced product data management and catalogue</td>
<td>Addressed management consolidation with SAP R/3 BP</td>
<td>Defined canonical language, data model and messages</td>
<td>Separated the build and run departments</td>
</tr>
<tr>
<td></td>
<td>Standardised financial reporting data models</td>
<td>Contracted data management</td>
<td>Established master data management</td>
<td>Established IT governance department</td>
</tr>
<tr>
<td></td>
<td>Developed master data management</td>
<td>Separation between business document data and formatting data</td>
<td></td>
<td>Introduced project steering committee</td>
</tr>
<tr>
<td><strong>Integration</strong></td>
<td>Changed integration platform protocol from TIBCO to JMS</td>
<td>Established webMethods-based integration platform</td>
<td>Implemented integration backbone based on webMethods</td>
<td>Established data manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Process integration via ticketing system</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Human resources</strong></td>
<td>Improved integration, architecture, project and partner management skills</td>
<td>Established project and architectural skills</td>
<td>Expect service, business and architectural thinking</td>
<td>Systematic development of the IT landscape</td>
</tr>
<tr>
<td></td>
<td>Outsourced the majority of code maintenance and testing</td>
<td>Established business relationship management</td>
<td>Deep technical understanding is still important</td>
<td>Efficient realisation of changes to the IT landscape</td>
</tr>
<tr>
<td></td>
<td>Enhanced social, business and strategic competencies</td>
<td>Outsourced build and run activities while enlarging IT governance department (planned)</td>
<td>Established skills to design services, data model and canonical messages</td>
<td></td>
</tr>
<tr>
<td><strong>IT processes</strong></td>
<td>Established IT-delivery process framework</td>
<td>Established project portfolio management and project approval process</td>
<td>Established strategic architecture planning and tactical project planning</td>
<td>Defined data management responsibilities</td>
</tr>
<tr>
<td></td>
<td>Centralised demand-management process</td>
<td>Introduced architecture and security check-up</td>
<td>IT governance (audits every developed artefact)</td>
<td>Shared services</td>
</tr>
<tr>
<td></td>
<td>Adopted architecture planning</td>
<td>Established communication on IT activities</td>
<td>Semi-automated artefact transformation process</td>
<td></td>
</tr>
<tr>
<td><strong>Organisational structure</strong></td>
<td>Structure changed with respect to shared enabler and solutions</td>
<td>Separated the build and run departments</td>
<td>Established a technical competence centre as support for local implementation teams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Established IT governance department and competence centre</td>
<td>Established IT governance department</td>
<td>Appointed data manager</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Still maintains local implementation units</td>
<td>Introduced project steering committee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Changes in IT resources and capabilities in the course of IT transformation
Since point-to-point integration is a key problem in the existing landscapes, they have established a company-wide SOA-based integration infrastructure. This infrastructure also forms the basis for end-to-end business process integration by applying business rules or workflows.

Although human IT capabilities were not explicitly mentioned in the initial set of IT transformation targets, all the companies realised that they had to be changed to achieve the fundamental changes in the IT landscape. In order to systematically redesign the IT landscapes, all the companies established enterprise architecture planning skills in their IT organisation. In the early phase of the IT transformation, enterprise architecture models are created to document the current situation and create transparency about the IT landscape. In the later phases, enterprise architects support the development of the architecture visions. To reduce ad hoc reactions regarding the business requirements and to improve coordination with the business function, the companies introduced demand management processes and a structured project portfolio management during the IT transformation. Complemented by architecture management, these measures generated the capability to systematically develop the IT landscape. If project management processes are effective, they also contribute to the efficient realisation of changes to the IT landscape. It may be argued that the human IT capabilities that we have identified in IT transformation are dynamic IT capabilities (Teece et al. 1997): They are necessary to reconfigure the technological IT capabilities and resources in order to address the changing business requirements and ensure the IT landscape’s systematic development.

7 Summary and Conclusion

Based on three case studies from information-intensive industries, we analysed the phenomenon of IT transformation. Our research’s contribution is two-fold: Our first contribution is a conceptual one. Drawing on the resource-based view, our research suggests a conceptual framework which allows us to systematically analyse IT transformation by means of capability networks. We argue that IT capabilities are integrated capabilities that can be further decomposed into technological as well as human IT capabilities and resources. Since capabilities can be the origin of other capabilities, IT capabilities may also be the source of business capabilities, which determine company performance and competitive advantage. As a second contribution, we gathered empirical data and gained interesting insights from three IT transformation initiatives. Our empirical results confirm the nature of IT transformation as a second-order change, i.e. changes to the system itself. Since IT transformation affects all categories of technological and human IT capabilities, it changes the IT landscape and the IT organisation’s ‘deep structure’. Our cross-case analysis helped us identify the technological IT capabilities that IT transformation induces. These capabilities comprise the flexible and cost-efficient functional support for all business processes, attractive online sales channels and platforms, professional master data management, as well as process and data integration. In addition, a set of dynamic human IT capabilities is necessary to manage the reconfiguration of the technological IT capabilities, namely architecture planning skills, relationship management with business functions, systematic development of the IT landscape and efficient realisation of changes to the IT landscape.

Based on our empirical analysis, IT transformation should be considered a specific and ‘new’ transformation phenomenon which brings about fundamental changes in the IT landscape and organisation. As far as we know, prior literature has primarily dealt with IT-enabled organisational or strategic change. While it has identified fundamental change characteristics, which IT transformations share, we argue that the current wave of IT transformation is characterised by specific drivers, notably the increasing complexity of IT landscapes, and requires specific IT capability changes. It is important to mention that IT transformation complements the well-known types of transformation: Since IT transformation contributes to and enhances business capabilities, it may be the origin of IT-enabled organisational or strategic change.

Our research and its results are subject to limitations. Most importantly, our research approach was exploratory and relies on only three cases. In addition, our convenience sample represents successful transformation initiatives, which may have led to some bias in our analysis. Further research should
eliminate this bias by examining a wider variety of companies, including ones that failed to transform. Another limitation is that we did not analyse the transformation process further, but focussed exclusively on the changes in capability and resource configuration induced by IT transformation. Consequently, we cannot draw any conclusions about temporal dependencies in the course of IT transformation.

To conclude, our conceptual and empirical work provides first insights into the phenomenon of IT transformation, which may inform other researchers. Our conceptual framework could serve as a basis for more qualitative or quantitative empirical work related to IT transformation. A particularly interesting area of research is the study of temporal dependencies in IT transformation, as this might lead to the development of a process theory and explain the temporal interdependencies in IT transformation.

References


