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ACIS 2013
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Information Systems: Transforming the Future

24th Australasian Conference on Information Systems, 4-6 December 2013, Melbourne

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Post-acquisition IT Integration: The sequential effects in growth-by-acquisition programs

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Abstract

The extant research on post-acquisition IT integration analyzes how acquirers realize IT-based value in individual acquisitions. However, serial acquirers make 60% of acquisitions. These acquisitions are not isolated events, but are components in growth-by-acquisition programs. To explain how serial acquirers realize IT-based value, we develop three propositions on the sequential effects on post-acquisition IT integration in acquisition programs. Their combined explanation is that serial acquirers must have a growth-by-acquisition strategy that includes the capability to improve IT integration capabilities, to sustain high alignment across acquisitions and to maintain a scalable IT infrastructure with a flat or decreasing cost structure. We begin the process of validating the three propositions by investigating a longitudinal case study of a growth-by-acquisition program.

Keywords

Acquisitions, Mergers, IT integration, Serial acquirers, Case study

INTRODUCTION

Many organizations, including, for example, Cisco and Siemens, have acquisition strategies for capturing economies of scale or acquiring growth options. These and other 'serial acquirers' (Laamanen and Keil 2008) complete several acquisitions each year. The challenges to do this include the extent of, and processes for, integrating the acquirer's and the acquisition's IT resources (henceforth called post-acquisition IT integration).

Without IT integration, the combined organisation cannot function effectively (Mehta and Hirschheim 2007). For example, Sarrazin and West (2011) report that 45-60% of the expected business benefits from acquisitions are directly dependent on IT integration. An Accenture survey of 151 serial acquirers ranked IT integration as the second most important reason for acquisition failures (Curtis and Chanmugam 2005), which are frequent. Two thirds of acquisitions fail to create financial value for the acquirer (Bourgeois and Patel 2009).

Two research streams are beginning to explain and seek solutions for successful post-acquisition IT integration. One stream explores the characteristics of the post-acquisition IT integration challenge (See, for example, Johnston and Yetton 1996; Giacomazzi et al. 1997; Wijnhoven et al. 2006; Mehta and Hirschheim 2006; Henningson and Carlsson 2011; Yetton et al. 2013). This stream identifies four IT integration processes that realize different business benefits: Absorption, Co-existence, Best of Breed and Renewal. The other stream explores the acquirer's capabilities to manage successful post-acquisition IT integration (Curtis and Chanmugam 2005; Robbins and Stylianou 1999; Stylianou et al. 1996; Tanriverdi and Uysal 2011). This stream of research identifies two critical capabilities for successful acquisition IT integration: selection and implementation capabilities. The effects of the capabilities are moderated by properties of the IT infrastructure resource: business and IT strategic alignment, and infrastructure scalability.

Together, the extant literature contributes to an emerging understanding of how IT-based value is realized in acquisitions. However, this research is restricted to the analysis of individual acquisitions. This limitation restricts our understanding of how serial acquirers create IT-based value and, in particular, how one acquisition affects subsequent acquisitions. This is important because 60% of all acquisitions are made by serial acquirers (Kengelbach et al. 2011). Rather than executing isolated deals, serial acquirers execute streams of mutually interrelated acquisitions (Laamanen and Keil 2008; Yetton et al. 2013). For example, both Wijnhoven et al. (2006) and Henningson (2012) propose that investments to increase IT infrastructure scalability improve the

efficiency of post-acquisition IT integration. However, while necessary to support a growth-by-acquisition strategy, those investments would not be justified to support a single acquisition. Addressing this limitation, the question framing this research is:

- How do serial acquirers realize IT-based value creation across acquisitions in growth-by-acquisition programs?

Attending to this research question, we adopt the resource-based theory as our analytical framework to examine how serial acquirers sustain IT integration across multiple acquisitions. The resource-based-theory (RBT) (Grant 2002; Peteraf 1993) has a proven track record in the IT literature to explain how IT resources contribute to business value (Wade and Hulland 2004) and, in the general literature on acquisitions, to explain how acquisitions create value for the acquirer (e.g. Capron et al. 1998). RBT directly links IT resources to acquisition value creation. As Wade and Hulland (2004, p. 109) conclude: "*The [resource-based] theory provides a valuable way for IS researchers to think about how information systems relate to firm strategy and performance. In particular, the theory provides a cogent framework to evaluate the strategic value of information systems resources.*"

To do this, acquisitions must be modelled as components in an acquisition program and not as single, independent events (Laamanen and Keil 2008). Specifically, the post-acquisition status of the acquirer's capabilities, business and IT strategic alignment, and infrastructure scalability, are the pre-acquisition IT factors that affect the success of the next acquisition. By investigating the sequential effects on these components, we develop a resource-based model of how serial acquirers realize IT-based value in growth-by-acquisition strategies. We begin the process of validating the model by investigating a longitudinal case study of Danisco, Denmark. Adopting a growth-by-acquisition program Danisco transformed itself from a diversified, regional conglomerate into a global organization with two major lines of business: food ingredients and enzymes.

Serial acquirers are frequently structured as multi-business organizations (MBOs). They acquire independent SMEs or business units from other MBOs (Laamanen and Keil 2008). In this paper, we exclude both the analysis of a merger between two MBOs and the acquisition of an MBO by another MBO. This restriction limits the generalizability of the conclusions presented here. However, the domain of post-acquisition IT integration by serial acquirers is both sufficiently theoretically important and under-researched to motivate this paper.

RELATED LITERATURE AND MODEL DEVELOPMENT

Within the general RBT literature, acquirers combine the resources of two organizations to create value (Sudarsanam 2003). Resources are the tangible and intangible assets that a business owns or controls (Capron et al. 1998; Grant 2002). An organizational capability is a particular type of intangible resource, specifically, the ability to perform an action, using the available resources, for the purpose of achieving a particular end result (Grant 2002). So, capabilities are the pre-requisites necessary to effectively deliver processes, specifically, in this paper, the capabilities to select and implement successful post-acquisition IT integration processes.

Below, we first present a short review of the extant literature on post-acquisition IT integration. Within this literature, IT-based value creation in individual acquisitions is based on three contingencies: the acquirer's post-acquisition IT integration capabilities, the acquirer's business and IT strategic alignment, and the scalability of the acquirer's IT resources. Subsequently, we analyze the sequential effects on performance of these three contingencies in growth-by-acquisitions programs. In combination, sequential effects are generative when the acquirer learns how to integrate the IT resources of acquisitions and how to avoid impairing the IT context. Alternatively, the sequential effects are degenerative when the acquirer fails to learn, has misaligned business and IT resources, or has a non-scalable IT platform.

Processes, Capabilities, Conditions and IT-based Value Creation in Acquisitions

Research on post-acquisition IT integration (See, for example, Johnston and Yetton 1996; Giacomazzi et al. 1996) reports that acquirers adopt one of four generic post-acquisition IT integration processes: Absorption, Co-existence, Best of Breed or Renewal. Subsequently, research investigates the different *selection* and *implementation* capabilities required to identify, choose and enact the four processes, and the conditions that moderate IT-based value creation (See, for example, Alaranta and Henningson 2008; Wijnhoven et al. 2006).

Selection and Implementation IT Integration Capabilities

The selection and implementation IT capabilities correspond to two high-level organizational capabilities that Zollo and Singh (2004) show are critical for post-acquisition value creation in organizations. One is the diagnostic capability to identify the threats from and opportunities for post-acquisition resource combinations, and to estimate their potential values. The other is the capability to implement successfully the integration strategy selected and realize the expected post-acquisition business benefits.

Selecting the right IT integration strategy is contingent on the expected IT-based business benefits from the acquisition (Wijnhoven et al. 2006; Mehta and Hirschheim 2007; Henningsson and Carlsson, 2011). For example, an Absorption IT integration process is designed to realize scale-based, cost benefits post-acquisition. Implementing the IT integration strategy selected is contingent on pre-acquisition IT deployment capabilities (Tanriverdi and Uysal 2011; Giacomazzi et al. 1997; Stylianou et al. 1996; Robbins and Stylianou 1999).

Each of the four integration processes realizes different post-acquisition benefits. These benefits are contingent on the IT integration mechanisms embedded in each IT integration process. An acquisition team must understand these differences to select the appropriate integration process to deliver the projected business benefit. In addition, as the four mechanisms create value by different resource redeployment mechanisms, they require different implementation capabilities.

In absorption processes, the target's IT resources are retired and replaced by the acquirer's existing IT resources. Data from the target's IT systems are converted and transferred to the acquirer's systems. The assumption is that the target's operations can be supported by the acquirer's IT resources (Giacomazzi et al. 1997; Johnston and Yetton 1996; Wijnhoven et al. 2006). Value creation is contingent on economies of scale to reduce IT costs and the potential to realize economies of scale in the combined organization.

Co-existence can be partial or full. In the former, some of the acquisition's IT resources are replaced by IT resources from the acquirer, leading to partial standardization with some IT resources shared between the acquirer and acquisition. The acquisition's retained IT resources do not replicate IT resources in the acquirer. In full co-existence, the acquisition's entire IT resources are retained. Value creation is contingent on economies of scope to increase revenues.

Best of Breed involves a conscious selection to be made between the acquirer's and the acquisition's IT-based business processes (Johnston and Yetton 1996). This strategy is adopted when some of the acquisition's IT-based business processes are considered superior. These business processes are frequently rebuilt on the acquirer's IT platform. Value creation is contingent on replacing IT-based business systems in the acquirer with more efficient and/or effective systems from the acquisition.

In renewal processes, IT resources in both the acquirer and the acquisition are replaced by developing new IT resources. This process is adopted when the combined IT resources of the acquirer and the acquisition cannot support the new post-acquisition business strategies and capabilities. This is the case, for example, when the acquisition is made to reposition the acquirer's business strategy from a niche to a scale-based strategy. Value is created by organizational transformation to leverage a more effective way of doing business.

The IT integration selection determines the mix of business benefits that can be realized from combining organizational resources (See, for example, Alaranta and Henningsson 2008). Acquisitions are driven by various synergistic effects, which are captured by different integration processes (Barkema and Schijven 2008a; Haleblian et al. 2009; Laamanen and Keil 2008). Combinations of processes can deliver a range of benefits.

Forming part of this general selection capability, we define the IT selection capability as the ability to *diagnose the right mix of IT integration processes* in combination with *securing access to the acquisition's critical IT resources* post-acquisition. For example, in one acquisition, the acquisition's supply chain system may be integrated corporate-wide post-acquisition in a Best of Breed process, while the post-acquisition integration of the project management system unique to the acquisition's R&D function is restricted to the acquired business unit within a co-existence integration process (Henningsson and Carlsson 2011).

The IT implementation capability to achieve post-acquisition IT integration is defined as *the ability to redeploy the IT resources post-acquisition according to the selected mix of IT integration processes*. The successful implementation of each of the four IT integration processes requires different capabilities (Wijnhoven et al. 2006; Henningsson 2012). In this way, the optimal mix of IT integration processes imposes different requirements on the IT implementation capability and the IT resources to be redeployed.

A fundamental difference between how the processes are implemented is the distinction between path-dependence and path-breaking processes (Capron et al. 1998; Karim and Mitchell 2000; Zollo and Singh 2004). Path-dependent acquisitions redeploy *existing* organizational resources from the acquirer to the acquisition or from the acquisition to the acquirer to create value. Path-breaking acquisitions use the acquirer's and the acquisition's resources to develop *new* resources. Absorption, Co-existence, and Best of Breed processes are path-dependent processes while the Renewal process is a path-breaking process. The differences between path-dependent and path-breaking acquisitions are important because the former are integral components of any growth-by-acquisition strategy. The latter is a discontinuous and, therefore, one-off strategic option.

The Moderating Effect of the IT Context: Alignment and Resource Scalability

Early research on post-acquisition IT integration attributed problems with IT integration to IT issues being considered only after the acquisition deal had been finalized (McKiernan and Merali 1995; Weber and Pliskin

1996). This research concluded that IT-intense acquirers should avoid technically incompatible acquisitions. Later research downplayed the role of technical compatibility, but corroborated the earlier conclusion that the success of IT integration projects is contingent on the initial IT conditions (Mehta and Hirschheim 2007; Wijnhoven et al. 2006). Wijnhoven et al. (2006) and Henningsson and Carlsson (2011) highlight the need for IT resources that enable a growth strategy; and Mehta and Hirschheim (2007) conclude that, due to time pressures, acquirers are motivated to use pre-existing IT resources in path-dependent IT integration processes rather than rebuild IT resources to improve post-acquisition performance.

Drawing on these findings, IT-based value creation in acquisition is contingent on the IT context in two ways. One is that business and IT alignment post-acquisition is critical to achieve the expected acquisition benefits. This is consistent with both the limited literature on business and IT alignment in acquisitions (See Johnston and Yetton 1996; Wijnhoven et al. 2006; Mehta and Hirschheim 2007) and the extensive general literature on the effects of business and IT strategic alignment on organizational performance.

Second, the resources required to implement IT integration processes are contingent on the scalability of the acquirer's pre-acquisition IT infrastructure. This is a function of modularity, connectivity and standardization (Bhatt et al. 2010; Byrd and Turner 2000), with the four IT integration processes dependent on different types of scalability. An Absorption IT integration process is contingent on whether the acquirer's tangible IT resources can be expanded to support the combined post-acquisition organization's business; Co-existence IT integration processes require that an acquisition's unique IT resources can be retained and integrated with the acquirer's IT platform; a Best of Breed IT integration process is contingent on enhancing the acquirer's IT corporate platform to deploy IT-based business processes from the acquisition to the acquirer's business units; and a Renewal process is contingent on the acquirer's corporate IT platform being able to support the re-invented IT resources.

A Growth-by-acquisition Strategy

To realize the potential synergies from acquisitions, serial acquirers combine acquisitions with organizational restructuring. Post-acquisition IT integration is frequently solved sub-optimally, generating organizational inefficiencies. These inefficiencies incrementally accumulate over a series of acquisition, creating a self-reinforcing spiral of decreasing organizational performance (Barkema and Schijven 2008b; Lubatkin 1983).

At a certain level of organizational inefficiency, a major organizational transformation program is launched to re-establish organizational alignment. Barkema and Schijven (2008, p. 699) suggest that *“Although it will typically be financially unjustifiable to engage in such major organizational change for each individual acquisition undertaken, the potential benefits of doing so may often become very real after a firm has undertaken a string of acquisitions over time”*. They argue that acquisitions cumulatively reduce effective integration and coordination until management must restructure.

For serial acquirers, the post-acquisition IT capabilities and IT context are the pre-acquisition IT capabilities and context that support the next acquisition. Consequently, to sustain a successful growth-by-acquisition strategy over a series of acquisitions, an acquirer must satisfy two conditions. One is to improve and/or sustain high pre-acquisition IT integration capabilities. The other is to sustain high business and IT strategic alignment, and high IT infrastructure scalability. Cumulatively, acquisitions that impair the IT context reduce post-acquisition performance and limit the organization's capability to effectively integrate subsequent acquisitions.

IT Integration Capabilities

Learning-by-doing and other learning initiatives improve post-acquisition integration performance (Zollo and Singh 2004). Henningsson (2012) shows that in learning how to do acquisitions several different learning processes are at play. Inexperienced acquirers may inappropriately generalize their previous experiences and perform below the level of novice acquirers in selecting the right IT integration process. The selection of a previously successful IT Absorption process in a situation where it is inappropriate is an example of this pattern. Over time, successful serial acquirers may develop the capabilities to select the appropriate integration process and efficient integration implementation routines. Less successful acquirers follow a declining performance trajectory and are forced to abandon their growth-by-acquisition strategy.

Importantly, learning improvements are contingent on acquirers' IT management gaining experience of a wide range of post-acquisition IT integration challenges. The resultant acquisition IT integration capabilities cannot be developed in the short period between identifying a potential acquisition and beginning the IT integration project. Their development frequently occurs over a number of acquisitions.

- Proposition 1: In a growth-by-acquisition strategy, the post-acquisition IT selection and implementation capabilities are the pre-acquisition capabilities for the next acquisition.

IT Context

For the serial acquirer, post-acquisition alignment and scalability become the pre-acquisition IT conditions for the next acquisition. Inefficiencies that accumulate across acquisitions would, in growth-by-acquisition programs, quickly reduce post-acquisition performance and inhibit value capture in subsequent acquisitions. If the acquirer is misaligned pre-acquisition, this cannot be adjusted during the acquisition process. So, in a growth-by-acquisition program, acquisitions would cumulatively increase misalignment unless the program was interrupted to re-align the business and IT strategies.

A growth-by-acquisition strategy also increases the relative cost of IT resources (Mitra 2005). While growth leads to economies of scale in IT operations, growing organizations spend relatively more on total IT resources. If the IT resources are not aligned with the dynamic growth strategy, the increasing complexity with scale of the IT infrastructure increases costs for control, coordination and future development (Mitra 2005).

- Proposition 2: In a growth-by-acquisition strategy, the post-acquisition IT and business strategic alignment is the pre-acquisition alignment context for the next acquisition.

In addition, making investments in IT scalability before a period of growth, called planned flexibility (Verganti 1999), improves acquirers' ability to accommodate the required changes with a minimum of time, effort and cost (Mitra, 2005). Research outside the acquisition context shows that organizational flexibility to adjust IT resources varies significantly, which affects how organizations develop (Sambamurthy et al. 2003).

Scalable IT resources have flat or declining cost structures that enable the acquirer to employ the four IT integration processes described above to realize business benefits from an acquisition. In general, the scalability of IT resources is a function of modularity, connectivity and standardization (Bhatt et al. 2010). Corporate IT platforms that do not meet these requirements, experience escalating complexity-related costs as organizations make acquisitions and increase in size (Mitra 2005). Therefore, a scalable IT platform is a necessary component of a successful growth-by-acquisition strategy.

- Proposition 3: A successful growth-by-acquisition strategy is contingent on scalable IT resources.

METHOD

This study adopts a positivist case study approach (Dubé and Paré 2003; Yin 1994) to examine the three propositions developed above by identifying "patterned regularities over time" (Markus & Robey, 1988). Thus, we collected qualitative process data (Langley, 1999) and applied the Dubé and Paré (2003) and Eisenhardt (1989) case methodology to analyze post-acquisition IT integration as part of a growth-by-acquisition program. We examine whether the critical events and relationships of the case support each proposition.

With our focus on the theory building in the under-researched domain of post-acquisition IT integration, qualitative case analysis was considered appropriate for the study in this paper (c.f. Mohr 1982; Yin 1994). The case setting supports the examination of how theoretical constructs from the resource-based theory of strategy translate to a new application area (George and Bennett 2004). The case approach is specifically designed to understand the events, states and transformations of development processes (Van de Ven 1992).

Research Context and Case Selection

The empirical results presented below are based on the experience of a Danish international industry group. Danisco adopted a growth-by-acquisition program in 1997 to transform itself from a regional industry conglomerate into a global organization with two major lines of business: food ingredients and industrial enzymes. Two characteristics made Danisco a suitable empirical setting for our research. One was that its growth-by-acquisition strategy required IT integration to fully realize the business benefits. The other was that Danisco was a successful acquirer, frequently being able to efficiently realize the potential benefits from its acquisitions. Between 1997 and 2011, Danisco made 23 acquisitions.

Investigating all those acquisitions was not feasible. Instead, we focus on two acquisitions in the food ingredients business, and one in the enzyme business (See Table 1). Of the two acquisitions in the food ingredients business, Cultor was acquired early in the acquisition program, while Rhodia was acquired after Danisco had become a successful acquirer. The third acquisition, Genencor, was a strategic decision to develop a global line of business in industrial enzymes. The acquisitions were theoretically sampled (c.f. Eisenhardt, 1989) to investigate how Danisco evolved from an inexperienced to a successful acquirer.

Table 1. Overview of the empirical case

Unit of study	Acquisition date	Head office	Unit employees	Unit sales
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Danisco			Copenhagen, Denmark	6,800 (2011)	€1,840 M
	Cultor	1999	Helsinki, Finland	3,000 (1999)	€1,300 M
	Rhodia	2004	Paris, France	900 (2004)	€211 M
	Genencor	2005	Palo Alto, United States	1,500 (2005)	€337 M

Data Collection and Data Analysis

Interviews were the primary method of data collection. The initial interviews were broad, including general management, strategy, organisational learning, and IT integration, to identify relevant initial conditions, states, events and transformations during a growth-by-acquisition program. Concepts related to the resource-based theory were part of this framework because of its generally recognised importance in the acquisition literature (Zollo and Singh 2004) and to explain value from IT resources (See, for example, Wade and Hulland 2004).

Interviews were wide-ranging and conversational to facilitate the collection of information to contribute to both theory development and future data collection (Eisenhardt 1989). They were recorded and transcribed. Interviewees were selected based on their ability to provide information on how managerial, strategic and IT factors interacted in the integration. Additional data sources (Table 2) were used to complement the interviews and to triangulate findings. Sensitive documents, including due diligence reports and other strategic documents, were studied at Danisco's premises.

Table 2. Overview of empirical data

Interviewee	Interviews	Subjects covered
CFO	1	Acquisition strategy, growth program, role of IT in Danisco
CIO	6	IT strategy, IT architecture, IT due diligence and IT integration
ERP manager	1	Due diligence and IT integration of Cultor, Rhodia, Genencor
IT integrator	1	Early acquisitions, Cultor acquisition, technical integration, scalability
Product line manager	1	Early acquisitions, Cultor acquisition, strategic intent, benefit realization

Data analysis commenced immediately after the first round of interviews was completed and continued iteratively throughout the research project. The analysis followed the congruence method of George and Bennet (2004) in which the process of theoretical generalization begins with a theory and then investigates the ability of the theory to explain an outcome in a specific case. Drawing on Strauss and Corbin (1990), a technique similar to systematic categorization was employed, with a priori categories based on the extant literature. Second phase coding was made by events and states, representing the combination of coding categories, following protocols based on Saldaña (2009) and Guest and MacQueen (2008). Consistency in categorization was achieved by comparing each passage with passages already coded with the proposed category. Based on event series, extensive case stories were written and shared with interviewees for verification.

MODEL VALIDATION

We begin the process of validating Propositions 1-3 by reviewing Danisco's growth-by-acquisition program. During the program, Danisco re-aligned its IT resources to the business strategies underpinning the acquisition program, built diagnostic and implementation capabilities, and developed a scalable IT platform. This improved IT-based value creation as the acquisition program was rolled out.

Danisco 1997-2011

Danisco A/S was formed in 1989 through a series of mergers to create a conglomerate based in Copenhagen, Denmark. More than 100 SBUs were managed as profit centers. Effectively, they competed as stand-alone companies in the Northern-European market. By 1997, Danisco had businesses in the areas of Food Ingredients, Sugar, Packaging and Foods, with sales of DKK 17 bn, an operating profit of DKK 1.76 bn, and an operating margin of 10.4%. However, many of the businesses had limited long-term prospects. For example, the sugar business was only profitable because of government subsidies, which were forecast to be withdrawn. In the areas

of packaging and foods, Danisco was a minor, regional player with limited capabilities to compete in an increasingly globalized market.

In 1997, a new CEO announced a radical strategy to transform Danisco from a regional conglomerate into a global food ingredients company, with sales to food processing companies instead of to consumers. At that time, the food ingredients business accounted for 17% of Danisco's sales. Funded by the gradual divestiture of the businesses in foods, packaging and sugar, Danisco adopted a growth-by-acquisition strategy to double the food ingredients business every five years. To do this, twenty-three acquisitions were made between 1997 and 2011.

In 1997, profit centers were free to choose between the corporate IT function and third party providers for IT services. This strategy was aligned to the existing corporate strategy of a regional conglomerate. It was not aligned with the new global business strategy. With a misaligned IT strategy, Danisco struggled in the late 1990s and early 2000s to realize the expected potential scale and scope-based synergies. Some limited benefits were realized with peer-to-peer and middleware-based IT integration. However, with every subsequent acquisition, the number of interfaces grew exponentially, increasing IT operational and maintenance unit costs. Finally, after struggling with bridging the heterogeneous IT infrastructure, Danisco came to realize that its vision of a global company required an IT capability that was standardized on a scalable, central platform.

In 2002, Danisco started to build the new platform, guided by the vision of a "true global company", in which each business process would exist in only one version and be supported by one IT system. If two or more business units used similar processes, the processes would be standardized on the corporate platform. Processes unique to a business unit would be supported locally by specific applications.

By 2011, Danisco had become a market leader in two global lines of business in the food ingredients and enzymes industries, growing its food ingredients business from 2,800 to 6,800 employees and operating in more than 40 countries worldwide. From the fiscal year of 1997/1998 to 2009/2010, revenue increased from DKK 3,375m to DKK 13,706m, generating a profit increase (EBIT) from DKK 527m to DKK 2,441m.

In 1999, Danisco acquired the financially challenged food ingredients company Cultor at a considerable premium to its market value. Danisco publically acknowledged that the acquisition would have a negative impact on its financial results in the short term and emphasized that its long-term strategy was to use the acquisition to build a platform for Danisco's expansion of its food ingredients business. To implement this strategy, Danisco acquired the food ingredients business of Rhodia in 2004. In 2005, it acquired Genencor to extend the business with a line of business in industrial enzymes. Together, these businesses formed the global business framework into which Danisco's other 20 acquisitions (See Appendix A) were integrated.

Acquisition IT Integration

Danisco's three largest acquisitions, Cultor, Rhodia's food ingredients business and Genencor, illustrate how Danisco's IT capabilities and integration strategy evolved during its growth-by-acquisition program. Integrating Cultor with a Co-existence process leveraged limited business benefits. No benefits were realized that were contingent on IT integration, including, for example, integrating production, logistics and sales. These benefits were not realized until Danisco's global platform was implemented in 2004, five years after its acquisition. To fully leverage the potential business benefits, a Renewal IT integration process was required. Danisco management was aware that the proposed Co-existence IT integration of Cultor would realize only a limited set of potential business benefits and that a Renewal process would be required later. This was one of the motivations supporting the subsequent development of the new IT platform.

While the new global IT platform was being developed, Danisco put the acquisition program on hold. When the new platform was ready in 2004, Danisco immediately acquired Rhodia's food ingredients business. The acquisition was driven primarily by scale-based benefits in the food ingredients business. IT integration was realized through an IT absorption integration process in which the new IT platform was expanded to support the acquired business. The food ingredients business was carved-out from Rhodia's corporate platform and migrated to Danisco's global platform on Day One of the acquisition.

The Genencor acquisition was primarily driven by scope-based benefits and some limited scale-based benefits resulting from the cross selling of Genencor's industrial enzymes to Danisco's existing customers. During the due diligence of Genencor, Danisco discovered two important IT requirements. One was that it needed to retain Genencor's unique IT resources supporting R&D in enzymes. The other was that Genencor's supply chain management system was superior to Danisco's existing system.

Danisco adopted an IT Absorption process to realize benefits of scale, a Co-existence process to realize benefits of scope, and a Best of Breed process to realize improved resource quality in supply chain management. To do the last, Danisco rebuilt Genencor's supply chain system and related business processes on Danisco's corporate IT platform. The new IT platform was based on a central SAP R/3 implementation that standardized business processes globally. Processes unique to business units were supported locally by specific applications. The new

platform reduced operating costs per user and production unit, provided full information transparency across the organization, improved scheduling of production and use of production capacity, provided more efficient logistics, and operated with a single customer interface. The IT strategy was now aligned with the global growth-by-acquisition business strategy.

All subsequent acquisitions were integrated using the high-level strategy that each business process should exist in only one version. For IT-based business processes that were not unique to Rhodia and Genencor, Danisco's IT-enabled standardized processes were implemented by expanding the new IT platform. Genencor's unique R&D processes were supported by extending the IT platform and its superior supply chain management processes were supported by enhancing the IT platform and Post-acquisition, these actions sustained the business and IT strategic alignment embedded in the new 2004 corporate IT platform.

Proposition Validation

When building the new IT platform, the CIO made two strategic decisions. One was to keep all current and future development of the platform in-house. When outsourcing development tasks, Danisco never hired consultants "to do the thinking." The company wanted to retain the IT diagnostic and implementation capabilities to develop and manage all IT architecture and IT-based business processes, ensuring it would remain "IT-ready" for acquisitions (See Yetton et al. 2013). Consultants undertook only well-defined tasks.

The other decision was to formally adopt a "fundamentalist strategy" for standardization. Requests for local exceptions to corporate standard processes were accepted only if the need was supported with written statements from local tax lawyers or other authorities. The decision was based on the argument that what may appear to be trivial exceptions in a particular case cumulatively builds complexity, reducing business agility. Subsequently, these two strategic protocols were mandated for all acquisitions. When Danisco acquired Rhodia and Genencor, Danisco's own IT staff were responsible for the selection and implementation of the IT integration processes. Consultants were used to carry out the day-to-day maintenance tasks, enabling Danisco's IT staff to concentrate on the IT integration.

Using internal staff who understood Danisco's IT systems and business processes was critical to investigating which of the acquisition's business processes could be supported by Danisco's pre-acquisition IT resources without reducing business and IT strategic alignment. This strategy enabled the realization of post-acquisition business value without introducing additional complexity into the IT infrastructure. Post 2004, Danisco achieved a decreasing IT operating cost-structure and used each acquisition to cumulatively refine its post-acquisition IT integration capabilities.

The case supports Proposition 1, *In a growth by acquisition strategy, the post-acquisition IT selection and implementation capabilities are the pre-acquisition capabilities for the next acquisition.* During its successful development of the new IT platform, Danisco developed IT integration capabilities. When integrating Rhodia, these capabilities enabled the IT integration of Rhodia on Day One of the acquisition with an Absorption, path-dependent IT integration process. The Rhodia integration further developed these capabilities, enabling the subsequent successful integration of Genencor.

The case also supports Proposition 2, *In a growth-by-acquisition strategy, the post-acquisition IT business and IT strategic alignment is the pre-acquisition alignment context for the next acquisition.* Before the new IT platform was developed, misalignment constrained IT-based value creation in the acquisition of Cultor. Aligning business and IT strategy in the new IT platform realized the potential IT-based business value in the Cultor acquisition, five years after that acquisition. Sustaining alignment across the subsequent acquisitions by selecting and implementing the right mix of integration processes enabled IT-based value creation in Rhodia, Genencor and the other subsequent acquisitions.

Finally, the Danisco case supports Proposition 3, *A successful growth-by-acquisition strategy is contingent on scalable IT resources.* The Danisco case illustrates the importance of both building and sustaining a scalable platform. To do that, Danisco became standardization fundamentalists.

DISCUSSION AND CONCLUSION

Findings

We develop three propositions that explain how serial acquirers sustain IT-based value creation across a growth-by-acquisition program. These propositions show that IT-based value creation in serial acquisitions is contingent on the acquirer's IT integration capabilities, business and IT alignment, and scalability of IT resources. The propositions are supported by the analysis of case data from Danisco's growth-by-acquisition program.

The selection and IT implementation capabilities are not standard capabilities that most organizations develop. Therefore, the initial IT integration problem is that consultants with these general capabilities do not have the in-

depth knowledge of the acquirer's IT resources to design and implement a successful IT integration strategy. However, while the internal IT management has the knowledge, it does not have the capabilities. So, the internal IT management and the consultants collude and adopt an Absorption strategy, which frequently does not realize the potential IT-based business benefits.

Reviewing the general literature on business and IT strategic alignment, Luftman and Derksen (2012) comment: "When considering this long-standing pervasive conundrum, it is not a question of being aligned versus misaligned, but rather leveraging the opportunities for enhancing the relationship among IT and business to attain demonstrable success." Here, we show how sustaining alignment across acquisitions is critical to a growth-by-acquisition strategy (Proposition 2). Failure to do so initially reduces the organization's ability post-acquisition to leverage the relationship between business and IT, foregoing potential IT-based benefits and threatening the growth strategy.

A scalable IT infrastructure has a flat or decreasing cost per unit when new production units, processes and users are added. This is a major technical challenge. An IT infrastructure with an increasing cost per unit could be sustained for one or two acquisition, but would become unsustainable for a larger number of acquisitions. Some current generation ERP platforms are designed to satisfy Proposition 3. However, many existing ERP platforms do not satisfy this proposition and constitute a major threat to a successful growth-by-acquisition strategy.

Implications for Theory and Practice

We add to the extant literature on post-acquisition IT integration by explaining the recursive effects on IT-based value creation of successive acquisitions in a growth-by-acquisition program. The extant literature on post-acquisition IT integration treats the individual acquisition as the unit of analysis. Henningson (2012) is the exception. However, sequential acquisitions have potentially both generative and degenerative effects on cumulative post-acquisition IT-based value creation.

This explains why investments that improve business and IT alignment, and IT infrastructure scalability (Propositions 2 and 3) are critical for the execution of a growth-by-acquisition strategy (See, for example, Wijnhoven et al. 2006; Henningson 2005). These investments to improve business and IT alignment, and IT resource scalability, could not be justified on the basis of an individual acquisition but are critical for the successful execution of a growth-by-acquisition strategy.

The findings reported above have three implications for practice. *First*, they explain why one-off acquisitions have a high probability of failure. Given the cost of, and elapsed time to develop, the required acquisition-specific IT capabilities, their development cannot be justified for a one-off acquisition. Therefore, in the absence of those capabilities, the acquisitions have a high failure rate. *Second*, the causes of failure cannot be resolved in the short run, for example, between announcing an acquisition and implementing it. The causes include the absence of selection and implementation capabilities, misalignment between business and IT strategies and a non-scalable IT platform. *Third*, once these prior conditions have been resolved, a growth-by-acquisition strategy has a high probability of success. For potential acquirers, the question is: Can they develop the required IT capabilities and context before failure discredits the growth-by-acquisition strategy? Of course, for those like Danisco that do develop the IT capabilities and context, successful serial acquisitions become normal. Not surprisingly, these 'successful' serial acquirers undertake 60% of acquisitions.

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