

2014

Sourcing strategies to keep up with competition: the case of SAP

Michelle Antero
Zayed University

Jonas Hedman
Copenhagen Business School

Stefan Henningsson
Copenhagen Business School

Follow this and additional works at: <https://aisel.aisnet.org/ijispm>

Recommended Citation

Antero, Michelle; Hedman, Jonas; and Henningsson, Stefan (2014) "Sourcing strategies to keep up with competition: the case of SAP," *International Journal of Information Systems and Project Management*. Vol. 2 : No. 4 , Article 4.

Available at: <https://aisel.aisnet.org/ijispm/vol2/iss4/4>

This material is brought to you by AIS Electronic Library (AISeL). It has been accepted for inclusion in International Journal of Information Systems and Project Management by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.



Sourcing strategies to keep up with competition: the case of SAP

Michelle Antero

Zayed University
Dubai, United Arab Emirates
www.shortbio.net/michelle.antero@zu.ac.ae

Jonas Hedman

Copenhagen Business School
Frederiksberg, Denmark
www.shortbio.net/jh.itm@cbs.dk

Stefan Henningsson

Copenhagen Business School
Frederiksberg, Denmark
www.shortbio.net/sh.itm@cbs.dk

Abstract:

This paper applies the Red Queen theory to explain how organizations utilize various sourcing arrangements in order to compete in an evolutionary arms race where only the strongest competitors will survive. The case study incorporates competition, and views sourcing strategies as a means to improve the firm's viability to survive competition in the marketplace. The study begins by positioning the Red Queen theory within the sourcing literature. It subsequently applies the framework to a case study of SAP AG to illustrate how sourcing strategies have changed over time in response to the logic of competition. The case study reveals that (a) organizations are adaptive systems and capable of learning to make strategic changes pertaining to sourcing arrangements; (b) organizations select the terms on which they want to compete by developing certain capabilities within the firm; (c) organizations are reflexive and over time develop competitive hysteresis which allows them to become stronger competitors. In the case of SAP AG, various sourcing arrangements were selected over its 40-year history to respond to technological and market changes.

Keywords:

ERP vendor; sourcing strategies; Red Queen Theory; SAP.

DOI: 10.12821/ijispm020403

Manuscript received: 23 September 2014

Manuscript accepted: 8 December 2014

1. Introduction

The study of information technology (IT) sourcing strategies has primarily focused on the analysis of IT functions that can be managed internally or transferred to third party vendors [1-4]. The focus is on firms that use IT to support their business. As such, sourcing strategies are viewed as alternatives to managing resources based on a maximization strategy, which assumes limited resources [2]. These studies have contributed greatly to understanding the benefits of sourcing strategies with a tendency to focus on the processes within a firm, however they do not take into account how these decisions were made against the backdrop of a competitive marketplace, and few have considered investigating the use of sourcing arrangements from a software vendor point of view. Researchers who have looked at these decisions have studied them at a particular point in time but did not consider how they altered the ability of an organization to compete in the long-run. Considering that software vendors are viewed as having the “sole job ... to follow the trends and provide leading-edge software and systems” [5], little sourcing research has studied the way software companies utilize sourcing strategies to manage their business activities and resources.

This paper fills a gap in the literature by addressing how sourcing strategies can contribute to the ability of software firms to keep up with the dynamic changes in the competitive market, as well as how these sourcing strategies evolve over time. Specifically, it answers the research question: how can software firms utilize various sourcing strategies to keep up with changes in the market – technological changes, market demands and rival actions?

The paper applies the Red Queen theory [6, 7] to explain how companies evolve and come up with various sourcing arrangements to keep up with the pace of technological innovation. The Red Queen theory is an evolutionary theoretical perspective, which suggests that sustaining the current level of performance of an organization requires continuous adaptation to the competitive environment in order to keep up with rivals who co-evolve in an attempt to win an evolutionary arms race. The Red Queen theory suggests that organizations select the terms on which they want to compete by developing certain capabilities within the firm. Over time, organizations develop competitive hysteresis, which allows them to become stronger competitors. In this view, organizations can be seen as adaptive systems that take part in the process of selection and adaptation of sourcing strategies to develop into stronger players. Specifically, this paper applies the Red Queen theory to taking into account other influences that are external to a software firm in order to contextualize its organizational strategy. In doing so, the paper illustrates a case study of how SAP changed its sourcing strategies over time in response to the logic of competition, to come out as a market leader in its field. By reviewing the various sourcing arrangements that SAP undertook over the past 40 years, we can show how the organization responded to technological and market changes.

2. Sourcing research

IT sourcing arrangements have been considered an undeniable trend as a cost-saving option for outsourcing IT functions since Eastman Kodak's decision to outsource to IBM, DEC and Businessland in 1989 [1-4]. Many of the studies that have looked at various sourcing arrangements have done so from the perspective of a customer [3]. Advances in the field have provided models to explain various approaches to sourcing [2]; provided decision-criteria for determining when to choose a particular sourcing strategy [8]; explained the risks [9]; uncovered myths and motivations [10]; understood factors that contribute to success [3, 11]; and provided best practices [1].

Sourcing arrangements require the formation of alliances which are “cooperative relationships driven by a logic of strategic resource needs and social resource opportunities” [12]. Strategic alliances enable organizations to leverage a partner network's resources [1, 13]. Networks that are formed through the creation of strategic alliances not only allow organizations to manage resources more effectively but also to increase the rate of innovation [14] and obtain economies of scale [5, 15]. Such alliances allow organizations to participate in a branching process and encourage innovation [14]; the rate of innovation is increased because strategic alignment with multiple partners provides access to different clusters of information [16]. These alliances are especially “relevant in high-technology industries, as the cost

of R&D has sky-rocketed and access to privileged information has become increasingly difficult in an industry where innovation is the main competitive weapon” [17].

An organization’s ability to innovate is dependent on its ability to recognize innovation opportunities as “a result of a conscious, purposeful search” [23, p. 6]. A firm can make several decisions and take action to come up with innovative opportunities to market a new product and/or service that is unique [18], rare [19], low cost [18]; valuable, inimitable, non-substitutable [19]; or scalable [20]. Another way is develop and patent new products through extensive research and development activities to keep competition at bay [21]. From an economic perspective this assumes scarce resources, however, and one of the limitations of innovating alone is that it becomes too costly to chase every technological shift. Coming up with new ideas is so difficult that once the original design is made, it becomes even more difficult to make substantial changes, making further enhancements incremental [14].

As a potential way around these inherent issues this paper proposes to look at sourcing arrangements as a way to support innovation activities that take place within a software vendor’s organization. These sourcing arrangements can be viewed in the following broad forms: insourcing and outsourcing. Insourcing arrangement is a sourcing strategy where an organization considers an outsourcing option to augment its current resources with external resources [22]. It may take the form of either a temporary resource or long-term relationship with a preferred supplier [23]. For a software provider, in-house sourcing arrangements assume that a firm has the ability to develop innovative products and services for customers through effective management of internal resources. In this situation, an organization optimizes its internal resources and processes to develop new capabilities [19]. Studies suggest that selective outsourcing – “the decision to source selected IT functions from external provider (s) while still providing between 20% - 80% of the IT budget internally” [1] – is more successful. Outsourcing is a sourcing arrangement where the work is moved outside the company. One unique form of outsourcing, known as netsourcing, is defined as the ability to access or rent business applications and services through the internet [8, 24]. In this particular model, the development of newer technologies has played a significant role in outsourcing arrangements [24].

A considerable amount of the strategic management literature suggests that an organization is able to compete if it has (a) the ability to recognize new opportunities that provide it with first mover advantage [21, 25, 26]; (b) a strategy that is formulated in relation to competitive forces [18]; (c) the ability to transform resources into abilities that are valuable, rare, inimitable and non-substitutable [19]; (d) the introduction of newer technologies has allowed companies to innovate at a cheaper rate at a faster pace [27]; or (e) the ability to scale up and learn from early innovator experiences [20]. While these theories of competitive advantage have provided useful lenses to explain how organizations innovate to compete, the analyses of the actions in organizations are seen as separate items rather than simultaneous actions that occur. Thus, this paper looks at how firms are selectively adapting their sourcing strategies to respond to competition and integrating a strategic process perspective into the analysis of various sourcing arrangements using Red Queen theory as a lens.

3. Red Queen Theory

The Red Queen theory [6, 7] can be used to explain competitive advantage. It is a useful lens to understand how organizations evolve by combining behavioral aspects that take into account organizational learning and economic rationalities – such as the desire to increase market share and profitability – to explain how and why organizations compete. It is predicated on the notion of coevolution, which suggests that organizations are in a never-ending race that requires them to constantly adapt simply to sustain their level of relative fitness [7]. This view of competitive advantage departs from earlier theories [18, 19], which do not consider that when firms coexist with rival firms, the improvements and feedback from the market are triggered simultaneously [7].

The Red Queen theory suggests that the evolution of a firm develops through a selection process. To win the race, an organization needs to outperform its rivals according to the context’s logic of competition by “matching or exceeding the actions of its rivals” [7, 28]. The Red Queen theory assumes that the organization’s viability to survive competition is based on its relative fitness to the competitors. It further stresses the importance of contextualizing an organization’s

strategic actions in relation to its historical and social setting to ascertain that the organization has the requisite ability to succeed [7]. According to the Red Queen theory, an organization that is historically exposed to competition generates stronger competitors and is likely to be more fit than the average organization that has not faced much competition. Likewise, new entrants are faced by the challenge of perhaps needing to come up with an industry-altering innovation to survive the entry process. Thus, changes in the industry are part of a selection-driven process.

For an organization, the choice of actions in responding to competition is informed by the experiences that the organization has had in the past and is relative to the knowledgeability of the human agents. Thus, the organization's solutions show elements of reflexivity based on "competitive hysteresis, the current-time effects of having experienced competition in the past" [7]. When new challenges are faced, organizations try to develop new capabilities where the costs of adapting against multiple competitors tend to be higher than if the same organization competed against a single rival. Over time, organizations accumulate experiences in responding to competition and gain the ability to deal with certain types of problems. One of the dangers for an organization that has established routines for solving similar problems is the possibility of falling into a competency trap which provides a disadvantage when circumstances have changed [7].

We posit that various sourcing strategies have aided SAP in the process of developing capabilities, where the costs of adaptation have increased at a time when more rivals have challenged SAP. By looking at a historical view of SAP's sourcing strategies, we can assess how various sourcing arrangements can aid the competitiveness of an organization rather than merely focusing on the cost-saving benefits that various sourcing strategies are purported to have.

Fig. 1 illustrates an application of the Red Queen Theory to sourcing arrangements for ERP vendors. We demonstrate that the Red Queen Sourcing Framework (RQSF) is a relationship between four players, the Vendor that creates the ERP System, the User Organization who buys and uses the ERP System, the Rival who competes with the vendor and a Sourcing Partner who delivers services to the Vendor to produce and deliver the ERP system.

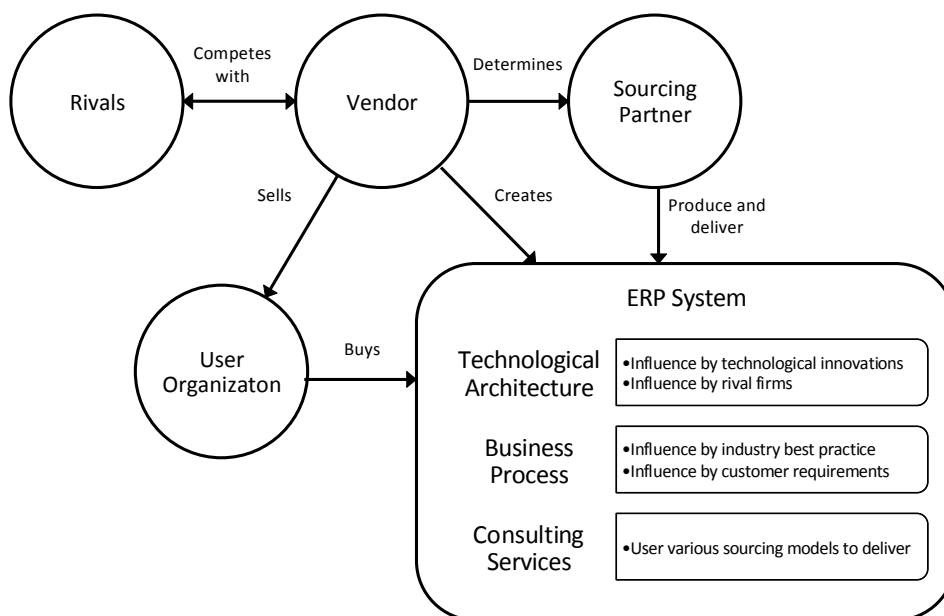


Fig. 1. Initial Red Queen Sourcing Framework

An ERP System is defined by the Gartner Group as “the ability to deliver an integrated suite of business applications” [29]. This definition suggests that the creation of an ERP system requires that a vendor is able to create a product and deliver a service on a particular technological platform, inscribed with specific business processes. A firm’s ability to compete amongst a multitude of alternative solutions is therefore impacted by its ability to maximize the resources available to it so that it can create innovative solutions that keep up with the changes in the market place. Various sourcing arrangements can thus be considered and selected to target specific business needs – such as operational effectiveness, tactical support and strategic impact [30]. This is especially important in the context of competition and the speed of technological evolution, which affects the internal sourcing responses of organizations over time.

4. Methodology

In order to make an explanatory study of the sourcing strategies of an organization within the ERP industry, we performed a qualitative analysis [31] using a case study method [32]. Data was gathered from publicly available sources, including textbooks, theses, news articles, corporate documents and information from the websites of SAP and its rivals. We began writing SAP’s narrative by identifying key events (e.g., the announcement of a merger or change in strategy), which were related to business models from multiple sources of data such as corporate documents, websites, and conferences. The narrative tells the story and enables analysis of events using theory. We then performed a qualitative analysis of the data by applying the Red Queen Sourcing framework [31]. To illustrate the causal linkages between various components of the framework, we used the framework to analyze the evolving sourcing strategy of an ERP vendor in a case study [32, 33].

The case was selected from the market-leader in the ERP industry, SAP AG, who has had a long established record of business success in pre-packaged software since the 1970s, as it entered a market that was dominated by IBM, and managed to withstand the dynamics of competition in the 1990s and outlast most of its competitors who succumbed to acquisitions in the 2000s. SAP AG is a recognized market leader by industry analysts. Instead of using a multiple-case study comparing different business models, a retrospective case study analysis of a single firm, SAP, allowed us to look at historical events and the corresponding changes to its business model after technological innovations were introduced to show how business models evolved. Prominent exemplars of retrospective case studies include Intel’s transition from memory chips to microprocessors [34], NCR transition into an electronics-based office equipment company [35], and Polaroid’s entry into digital photography [36].

A retrospective case study has both advantages and disadvantages [37]. A retrospective case study lends itself to the creation of a high-level story that outlines major events, transformations, and their outcomes. Some important transformation processes span decades, which make them extremely hard to follow in real time. In particular, it may only be possible to ex-post determine which transformational processes provide new interesting insights to fuel theory building. The retrospective case study is not, however, appropriate for addressing the micro-level process of *why* decisions were taken and the cognitive processes behind these decisions, as explanations of these detailed levels frequently become ex-post constructions that do not necessarily match how the process played out a few decades earlier. We therefore restrain our analysis to those factual circumstances that can be documented, and recognize the need for future real-time process studies to explain why some organizations manage to make the transitions described in the analysis.

5. SAP AG

The story of SAP demonstrates how a software firm was able to fend off rival actions, which were destabilizing the current mode of developing software, and led to its adoption of a new sourcing activity. The case of SAP is interesting because it started out as a disruptive idea that challenged traditional models of developing individual customized solutions for businesses. Over time, it was able to adapt to changing technological shifts, which enabled it to obtain and maintain a market leader position in developing ERP systems.

5.1 *Surviving the Entry Process*

In 1972, five former IBM employees started SAP with a vision of commercially developing an off-the-shelf-system (COTS) for real-time data processing. As a new entrant, SAP changed the way software was developed – SAP developed a core solution that was customized to fit its clients – at a time when software development was traditionally customized by consultants like IBM to meet specific client needs, developed on mainframe systems and catered to large enterprises. “New innovations by IBM’s rivals had to be exceptionally valuable from a customer’s perspective” [7].

In the first year, SAP’s main revenue came from helping clients in their data centers. At night and weekends they spent time developing their first software on borrowed computers. In 1973, SAP releases its first financial accounting module. This module served as the cornerstone in the on-going development of other software modules of the system that would eventually bear the name SAP R/1; where R stood for real-time processing [38]. All development was done on externally located IBM mainframe servers running the DOS operating system. In 1974, the first technological shift occurred when SAP converted the financial accounting module from the DOS to the OS operating system for larger IBM servers. Over the next years, modules for purchasing, inventory management, and invoice verification were released.

A few years after the first installation, SAP obtained customers in Switzerland. The development of SAP’s software progressed after SAP completed the asset accounting module and its corresponding implementation with a pilot company. One of SAP’s customers – John Deere, the farm equipment manufacturer – played a significant role in the internationalization of SAP’s product when SAP was requested to develop a multi-lingual version of their accounting software to support several languages, countries and legal entities in 1975 [38].

In 1979, SAP operated its own development environment/server (i.e., Siemens 7738) for the first time, and built its own data center. Prior to this period, all development activities had been distributed across the data centers of regional customers. Later that year, SAP made an in-depth examination of IBM’s database and dialog control system, which led SAP to rethink its software and pave the way for SAP R/2, which was released in 1982 [38]. The following year they launched a sales and distribution application module, through a custom development project based on customer specifications.

5.2 *Cost of Adaptation and Expansion*

In the 1980s, SAP’s rivals were focused on developing modular solutions for both large- and medium-size enterprises. One of SAP’s biggest rivals was the Baan Corporation, an established company founded by Jan Baan in the Netherlands in 1978 to focus on financial and administrative consulting services [39, 40]. In 1981, the Baan Corporation started developing solutions on a UNIX operating system. By 1984, there were attempts to specialize in certain industry verticals to allow it to build a stronger position [40].

At the beginning of the 1980s, SAP grew into a company with around 100 employees and appeared at an IT trade show. Joint development with customers was used as a strategy to develop and enhance the R/2 system, a mainframe-based software that is still considered to be a very stable system. During this period, the production management module was released, followed by a module for production planning and control in 1983. In the following year, SAP expanded internationally and its first subsidiary, SAP International AG, was founded in Biel Switzerland [38].

SAP’s own data center grew, and hosted three IBM servers and a Siemens server with a total of 64MB of main memory and used for the development of software. An internal quality assurance committee was established to improve the stability of software and increase the quality of work processes. Its first US headquarters was established in 1985 and as global expansion continued in 1986, a subsidiary in Austria and a German branch office were opened. The eventual growth in the number of employees – reaching 300 – forced SAP to restructure and create different departments with managers. Changes in the legislation governing balance sheets led to 100 new customers, and a subsequent growth in revenue. After three years of work, the SAP module for human resource management was released at the CeBIT Fair in Hanover.

In 1987, the first non-German-speaking subsidiary in the Netherlands was opened. SAP opened offices in France, Spain, and Great Britain in the same year, and also held its first user conference in Karlsruhe, Germany, aimed at establishing a platform that enabled current and potential users to share experiences. IBM's new generation of servers enabled SAP's software to become available to midsize customers. SAP also established SAP Consulting to support new customers. In the next year, SAP began developing RIVA – a billing and administration module for utility companies – to meet the requirements of selected industries. A user-friendly interface for SAP R/2 was later introduced. The company also launched various development projects, including the ABAP/4 programming environment in 1989. In 1990, SAP strengthened its financial basis by raising DM 85 million on the capital market and used it to further develop SAP R/2 and the new SAP R/3 system. A focus on mid-sized companies led SAP to acquire the software companies Steeb and CAS.

By the late 1980s, distributed computing allowed newer applications to be built using UNIX workstations and personal computing [7]. In 1991, a sneak preview of the first modules in the new SAP R/3 system were shown at CeBIT (Centrum für Büroautomation, Informationstechnologie und Telekommunikation). With its client-server concept, uniform graphical interface, dedicated use of relational databases, and support for servers from various manufacturers, R/3 was to be sold on the midsize market as well as to the branch offices and subsidiaries of larger corporate groups. Expansion was also directed to the east after the lifting of the "Iron Curtain", including a cooperative agreement with the largest Russian software company ZPS, and with the development of a Russian version of SAP R/2.

After the launch of R/3 in 1992, SAP changed its partner strategy to include independent consulting firms, which SAP referred to as "logo partners", to support customers in implementing the new system. As part of the new partner strategy, SAP entered a partnership with Microsoft to port SAP R/3 to the Windows NT operating system in 1993. SAP also began participating in the IXOS project, a joint undertaking involving the development and marketing of an electronic archiving system for original documents. Efforts to improve the technological basis were made, a version of SAP R/3 was created with support for kanji characters for the Japanese market and R/3 was also ported to SUN hardware, enabling it to run on all relevant RISC platforms.

In 1994, the R/3 system was released for Windows NT. One month later, a Swiss company became the first customer to go live with this new version. In addition to the utility focus, SAP began to focus on the retail industry by acquiring a 52% holding in DACOS Software GmbH, and in 1995, more emphasis was put on midsize companies with the help of system resellers. Later the same year, SAP started to develop an industry solution for the telecom industry together with Deutsche Telekom AG.

In 1996, SAP took another technological leap when it introduced its joint internet strategy with Microsoft. Through open interfaces, customers could now connect online applications to their SAP R/3 systems. In addition, SAP could also take advantage of IBM's new AS/400 platform. They continued to involve consumers and had 4,300 guests at the European SAPHIRE event in Vienna. Over 8,000 attendees flocked to the corresponding event in the U.S., and more than 5,000 were on hand for the first SAPHIRE event in Japan.

In 1998, a new interface was launched – EnjoySAP – at SAPHIRE in Los Angeles. SAP planned to make its software easier to learn, faster to work with, and simpler to customize to customer needs. In May 1999, SAP announced a new strategy that completely realigned the company and its product portfolio: mySAP.com. This reorientation would combine e-commerce solutions with SAP's existing ERP applications on the basis of cutting-edge Web technology. To support the Internet focus a German Internet subsidiary, e-SAP.de, was founded, reflecting the strong focus on the customer in the Internet age. This was followed by new applications for marketplaces and portals and by outsourcing to its SAP Portals subsidiary and starting partnerships with Commerce One and TopTier.

Building on the Internet focus a new platform was launched in 2004 – SAP NetWeaver. This technology enabled SAP to offer fast, open, and flexible business applications that support end-to-end business processes – no matter whether they are based on systems from SAP or other providers. SAP Labs China marked the ninth opening of a development location outside Germany. This and the other research centers in India, Japan, Israel, France, Bulgaria, Canada, and the

United States helped SAP convert IT expertise into business utility for its customers. A new technological vision was put in place when SAP introduced its plans for service-oriented enterprise architecture.

5.3 Competition Through Predation

The widespread adoption of ERP systems in the late 1990s and early 2000s challenged several ERP vendors in their race to increase market share [41]. As such, the industry experienced a period of consolidation and witnessed several mergers and acquisitions. Shortly after SAP released its SOA-enabled ERP in 2006, they made several acquisitions – including Pilot Software, Yusa, OutlookSoft, Wicom, and MaXware. SAP also announced its intention to purchase Business Objects, a company specializing in business intelligence (BI) applications. In May 2010, SAP announced plans to purchase the company Sybase for approximately US\$5.8 billion. Sybase was the largest business software and service provider specializing exclusively in information management and mobile data use. The synthesis of the two leading companies was to produce solutions for "wireless" companies.

6. Discussion

SAP's entry into the new market in the 1970s was made possible because the founders of SAP were able to utilize knowledge of the market from their prior positions in IBM. SAP's founders had traditionally worked with an industry-leader, aiding its ability to survive entry into the race through knowledge of the market. Its ability to develop modules that inscribed "common business functions" reduced the cost of developing the system. From a development point of view, SAP insourced much of the application development for user organizations. For instance, it first developed software for its clients by building it on externally located IBM software. It was only in 1979 when it began to operate its own development environment that it built its own data center. It later used insourcing through joint development with clients to produce software in other languages. Interestingly, from a customer point of view, SAP was actually providing them with an insource solution to develop enterprise applications for the user organization. Fig. 2 below shows the structural arrangement of SAP's decision to enter the new market of creating IT systems for organizations.

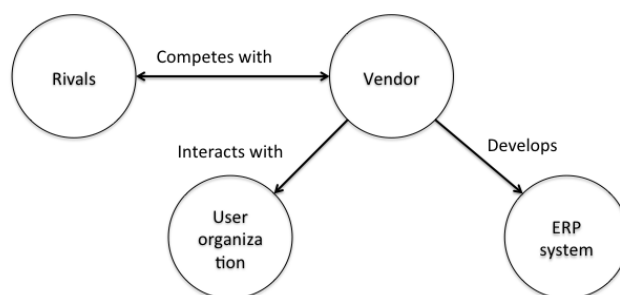


Fig. 2. Red Queen effect of insourcing

In the 1980s, SAP responded to its competition by expanding globally through selective alliances and packaging their solutions as an integrated solution, at a time when its competitors were focused on selling modular solutions. SAP started developing solutions on multiple platforms to keep up with various technological changes in the market. Instead of betting on a single platform, SAP decided that it would compete in the market with solutions on different operating systems. This was a very costly way to expand globally, not only did SAP face multiple competitors and competition,

but it also quickly needed to learn how to develop software that supported multiple technological architectures and a way to deliver it.

In the late 1990s/early 2000s, at a time when there was an increased demand for ERP packages, and companies started buying ERP software as a way to achieve business process reengineering, SAP responded to the competition in multiple ways.

- First, it changed its partner strategy to outsource some of its sales and customization efforts to increase the economies of scale and reach more customers. This increase corresponded to an increase in sourcing activities from a user-organization point of view (as seen in Fig. 3), where SAP can be seen as a long-term partner that developed business applications for the user organization;
- Second, SAP insourced part of its development efforts in the form of joint development efforts with Microsoft to enable the delivery of new products;
- Third, it developed internet-based solutions to try to generate new sources of income, essentially netsourcing some of its applications. SAP netsourced its product by hosting its solution for the user, and later by selling directly to the user. Customers continued to have the same vendor-relationship with SAP but the need to create an in-house server architecture was reduced, which enabled a reduction of cost on their part. SAP's provision of a new architectural solution enabled it to provide a software solution that fit the new demands of a user organization based on the software available in the market. SAP's choice of outsourcing strategies enabled it to respond to the increased competition that it faced and found a new solution to its dilemma of scaling up its production and sales of software to meet market demand;
- Fourth, in the late 2000s SAP participated in a process of acquisition to allow it to increase its market shares, as well as expand its modular base. This predatory response to competition suggests that, in order to compete, SAP started acquiring knowledge and market bases to increase its capacity to innovate and scale. By acquiring solutions in the market place, SAP not only killed the Red Queen, but it also incorporated new knowledge about the market and new software solutions into SAP. The consolidation efforts during this period and predatory response of existing ERP vendors to obtain a market share allowed new entrants, such as Microsoft, to participate in this marketplace. Such a predatory response further proves that there is a real threat to the viability of an organization. In a competitive marketplace where only the strong players survive, SAP's attempts to improve the products and service it delivered thus entailed an ability to be agile, adaptive, innovative and responsive to market demands, and these efforts were supported by engaging in various sourcing activities while maximizing its resources.

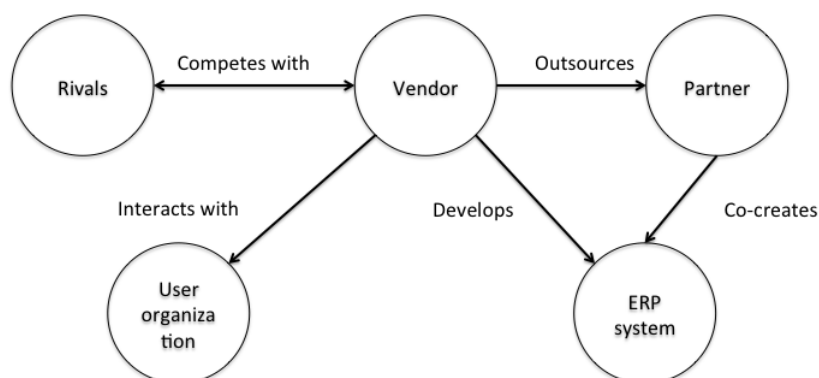


Fig. 3. Modified Red Queen Sourcing Framework

As we have seen in the case study, competition and technological evolution have made a significant impact on software development, and technology management, thus organizations change their sourcing arrangement to respond to these shifts over time. Table 1 summarizes the logic of competition for SAP over time.

Table 1. Summary of rival activities and responses

Period	Rival activities	SAP's responses		
		Motivation	Activities	Mode
1970S	Current Business Model: Software provider of "in-house" development of business applications for a user organization IBM is the biggest rival Technological Architecture: Mainframe-based Target Market: Large Enterprise	Development of new business model "off the shelf systems"	Technological Architecture: Mainframe Business Process – focused on Manufacturing and Accounting Business Process - Develop common modules that can be sold as COTS Services – customizations can be made to the software Market – Large Enterprises	Insourcing by developing software on externally located IBM software Later in 1979 operated its own development environment and building its own data center Insourcing through joint development with client to produce software in other languages
1980S	Modular solutions Baan is the biggest rival New Technologies: UNIX + C New Market segment: Midsized-market New business processes emerged: Human Resources	Focus is on global expansion Raise financial capital	Sold integrated solutions Technological Architecture: New Generation of Mainframe Servers (AS400) Business Process: Introduction of Human Resource Module Services – translation of software into different languages	Insourcing by knowledge acquisition - Acquires Steeb and CAS
1990S	Technological Architecture: Client/Server Compete for new market Multiple competitors New Business Processes: Supply Chain Management, Customer Relationship Management, Product Lifecycle Management	Focus is to compete for new markets	Technological Architecture: Client/Server Business Process: Develop document archiving process Customer response: Improvement in software interface to make software easier to learn and use Market: Midsized market	Outsource development efforts e.g. IXOS project, industry solutions Outsource sales and implementation to partners Joint internet strategy with Microsoft in 1996 to develop new software
2000S	Y2K/internet boom Multiple competitors Focus on expanding to new markets and new offerings Enters a period of acquisitions	Focus on expanding to new markets and new offerings	Technological Architecture – Web-based, delivers new platform NetWeaver Cloud solution Market: SME market	Insourcing by knowledge acquisition Enters a period of acquisitions to acquire knowledge and customers

Fig. 4 shows a modified RQSF to demonstrate that sourcing arrangements are in fact based on three things: competitive environment (e.g., new technologies, new target markets, rival actions); maximization of resources; and customer requirements. In the case of SAP, we can see that it was an adaptive organization capable of making the necessary changes to allow it to fend off its competition and maintain its market leadership. This shows that over time it developed competitive hysteresis which provided it with the know-how to respond to new competition, and it was able to take advantage of its 40 year expertise in the field of developing COTS products.

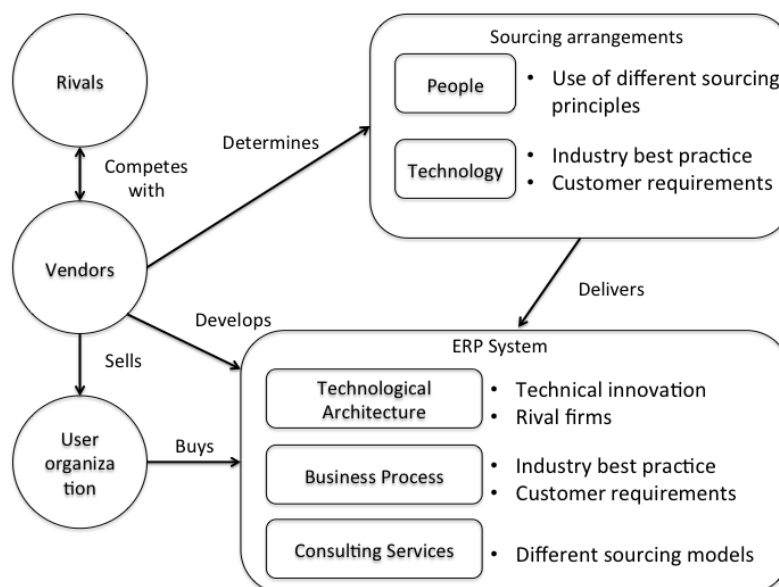


Fig. 4. Modified Red Queen Sourcing Framework

7. Conclusion

The case study method effectively illustrates the applicability of the EBF theoretical framework to the study of sourcing arrangements. Future case-study research can investigate and compare multiple organizations to see how various organizations have used various sourcing strategies to compete. By incorporating the Red Queen theory to explain outsourcing strategies, we showed that the motivations behind outsourcing are not limited to the maximization of resources but can be attributed to the viability of the firm to outperform and survive its competition. This implies that practitioners should consider various sourcing arrangements in order to compete, and academics need to consider the competitive landscape to explain sourcing decisions.

The findings reported here suggest that sourcing strategies play an important role in the ability for firms to compete in the marketplace. By applying the Red Queen theory to SAP's case study, we have illustrated that organizations make strategic choices pertaining to sourcing arrangements. Organizations select various capabilities, often referred to as a core competencies, for the firm in order to preserve their competitive advantage. In reviewing the various sourcing arrangements that SAP undertook over the past 40 years, we revealed how a software organization adopted various sourcing arrangements (i.e., insourcing, outsourcing, netsourcing), which changed over time in order to keep up with technological shifts, customer demands and rival actions. We have seen that sourcing decisions have been generally applied in response to competition in multiple ways. First, sourcing decisions were used for the management of the technological base. Second, sourcing decisions were used to develop new offerings (e.g. new modules or industry solutions) and enhance existing offerings (e.g. support of several languages). Third, sourcing decisions were used as a means to scale up operations by partnering with business integrators to increase sales. Finally, sourcing decisions were made to acquire knowledge and extend capabilities. Over time, SAP developed competitive hysteresis, which allowed it to outperform and outlast its competitors. To date, SAP remains a dominant player in the field of developing ERP software.

References

- [1] M. Lacity, and L. P. Willcocks, "An Empirical Investigation of Information Technology Sourcing Practices: Lessons from Experience," *MIS Quarterly*, vol. 22, no. 3, pp. 363-408, 1998.
- [2] R. Hirschheim, and M. Lacity, "The Myths and Realities of Information Technology Insourcing," *Communications of the ACM*, vol. 43, no. 2, pp. 99-107, 2000.
- [3] N. Levina, and J. W. Ross, "From the Vendor's Perspective: Exploring the Value Proposition in Information Technology Outsourcing," *MIS Quarterly*, vol. 27, no. 3, pp. 331-364, 2003.
- [4] L. M. Applegate, and R. Montealegre, *Eastman Kodak Company: Managing Information Systems Through Strategic Alliances*, Harvard Business School, Cambridge, Massachusetts, 1991.
- [5] J. Barthelemy, "The Hidden Costs of IT Sourcing," *MIT Sloan Management Review*, vol. 42, no. 3, pp. 60-69, 2001.
- [6] L. Van Valen, "A New Evolutionary Law," *Evolutionary Theory*, vol. 1, pp. 1-30, 1973.
- [7] W. P. Barnett, *The Red Queen among Organizations: How Competitiveness Evolves*, Princeton, New Jersey: Princeton University Press, 2008.
- [8] C. Loebbecke, and C. Huyskens, "Development of a model-based netsourcing decision support system using a five-stage methodology," *European Journal of Operational Research*, vol. 195, pp. 653-661, 2009.
- [9] E. D. Hahn, J. P. Doh, and K. Bunyaratavej, "The Evolution of Risk in Information Systems Offshoring: The Impact of Home Country Risk, Firm Learning, and Competitive Dynamics," *MIS Quarterly*, vol. 33, no. 3, pp. 597-616, 2009.
- [10] M. Lacity, and L. P. Willcocks, *Information Systems Outsourcing: Myths, Metaphors and Realities*, Chichester: Wiley, 1993.
- [11] J. N. Lee, and Y. G. Kim, "The Effect of Partnership Quality on IS Outsourcing Success: L. Conceptual Framework and Empirical Validation," *Journal of Management Information Systems*, vol. 15, no. 4, pp. 29-61, 1999.
- [12] K. M. Eisenhardt, and C. B. Schoonhoven, "Resource-based View of Strategic Alliance Formation: Strategic and Social Effects in Entrepreneurial Firms," *Organization Science*, vol. 7, no. 2, pp. 136, 1996.
- [13] T. K. Das, and B.-S. Teng, "A Resource-Based Theory of Strategic Alliances," *Journal of Management*, vol. 26, no. 1, pp. 31-61, 2000.
- [14] S. A. Kauffman, "Escaping the Red Queen Effect," *The McKinsey Quarterly*, vol. 1, pp. 119-126, 1995.
- [15] L. Loh, and N. Venkatraman, "Determinants of Information Technology Outsourcing: A Cross-Sectional Analysis," *Journal of Management Information Systems*, vol. 9, no. 1, pp. 7-24, 1992.
- [16] R. Burt, "The Social Structure of Competition," in *Structural Holes: The Social Structure of Competition*, pp. 8-49: Cambridge, MA: Harvard University Press, 1992.
- [17] M. Castells, *The Rise of the Network Society*: West Sussex, UK: Blackwell Publishing, 2010.
- [18] M. E. Porter, "From Competitive Advantage to Corporate Strategy," *Harvard Business Review*, no. 65, pp. 43-59, 1987.
- [19] J. B. Barney, "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, vol. 17, no. 1, pp. 99-120, 1991.
- [20] C. C. Markides, and P. A. Geroski, *Fast Second: How Smart Companies Bypass Radical Innovations to Enter and Dominate New Markets*, San Francisco, CA: John Wiley and Sons, 2005.

- [21] M. B. Lieberman, and D. B. Montgomery, "First-Mover Advantages," *Strategic Management Journal*, vol. 9, Summer, pp. 41-58, 1988.
- [22] R. Hirschheim, "The Myths and Realities of Information Technology Insourcing," *Communications of the ACM*, vol. 43, no. 2, 2000.
- [23] L. P. Willcocks, and M. Lacity, *Strategic Sourcing of Information Systems*, Chichester: Wiley, 1998.
- [24] T. Kern, M. Lacity, and L. P. Willcocks, *Netsourcing: Renting Business Applications and Services over a Network*, Upper Saddle River, NJ: Pearson Education, 2002.
- [25] P. F. Drucker, "The Discipline of Innovation," *Harvard Business Review*, vol 63, no. 3, pp. 5-10, 2002.
- [26] C. M. Christensen, and M. Overdorf, "Meeting the Challenge of Disruptive Innovation. (cover story)," *Harvard Business Review* vol. 78, no. 2, pp. 66-76, 2000.
- [27] E. Brynjolfsson, and M. Schrage, "The New, Faster Face of Innovation," *MIT Sloan Management Review*, August 17, 2009.
- [28] P. J. Derfus, P. G. Maggitti, C. M. Grimm, and K. G. Smith, "The Red Queen Effect: Competitive Actions and Firm Performance," *Academy of Management Journal*, vol. 51, no. 1, pp. 61-80, 2008.
- [29] C. Hestermann, C. Pang, N. Montgomery, "Magic Quadrant for ERP for Product Centric Market," Gartner Group, Dec, 2010.
- [30] H. A. Smith, and J. D. McKeen, "Developments in Practice XIV: IT Sourcing - How Far Can You Go?," *Communications of the Association for Information Systems*, vol. 13, no. 1, pp. 508-520, 2004.
- [31] M. B. Miles, and A. M. Huberman, *Qualitative Analysis*, Second ed., London: Sage Publications, 1994.
- [32] R. K. Yin, *Case Study Research: Design and Methods*, Thousand Oaks, CA: SAGE, 2009.
- [33] K. M. Eisenhardt, "Building Theories from Case Study Research," *Academy of Management*, vol. 14, no. 4, pp. 532-550, 1989.
- [34] R. Burgelman, "Intraorganizational ecology of strategy making and organizational adaptation: theory and field research," *Organization Science*, vol. 3, no. 2, pp. 239-262, 1991.
- [35] R. Rosenbloom, "Leadership, capabilities, and technological change: the transformation of NCR in the electronic era," *Strategic Management Journal*, October–November Special Issue 21, pp. 1083-1103, 2000.
- [36] M. Tripsas, and G. Gavetti, "Capabilities, cognition, and inertia: Evidence from digital imaging," *Strategic Management Journal*, October–November Special Issue 21, pp. 1147-1161, 2000.
- [37] P. S. Ring, and A. H. Van de Ven, "Structuring cooperative relationships between organizations," *Strategic Management Journal*, vol. 13, no. 7, pp. 483-498, 1992.
- [38] C. Neumann, and J. Srinivasan, *Managing Innovation from the Land of Ideas and Talent: The 10-Year Story of SAP Labs India*, Berlin: Springer, 2009.
- [39] E. M. Shehab, M. W. Sharp, L. Supramaniam, and T. A. Spedding, "Enterprise Resource Planning: An integrative review," *Business Process Management Journal*, vol. 10, no. 4, pp. 359 – 386, 2004.
- [40] H. A. Post, "Building a Strategy on Competences," *Long Range Planning*, vol. 30, no. 5, pp. 733-740, 1997.
- [41] F. R. Jacobs, and F. C. Weston, "Enterprise resource planning (ERP) - A brief history," *Journal of Operations Management*, vol. 25, no. 2, pp. 357-363, Mar, 2007.

Biographical notes**Michelle Antero**

Michelle Antero is an Instructor at the College of Technological Innovation at Zayed University and a PhD Candidate at Copenhagen Business School. Her research looks at enterprise systems and the impact of strategic partners, business models and technological infrastructure on a vendor's ability to compete. She has published in Information Research Management Journal, the International Journal of Enterprise Information Systems and for international conferences such as AMCIS, ECIS and CENTERIS.

www.shortbio.net/michelle.antero@zu.ac.ae

**Jonas Hedman**

Jonas Hedman is an Associate Professor at the Copenhagen Business School, Department of IT Management. His research focuses on payment and in particular the cashless society, emerging business models in different contexts, such as ERP systems and gaming industry, and the digitalization of society and business. He has published in journals such as the Information Systems Journal and the European Journal of Information Systems, and written books on business models and IT.

www.shortbio.net/jh.itm@cbs.dk

**Stefan Henningsson**

Stefan Henningsson is an Associate Professor at Copenhagen Business School, Department of IT Management. His current research addresses managerial aspects of IT in contexts that include corporate mergers and acquisitions, digital payments and international trade processes. Previous publications include more than 70 peer-reviewed papers published in journals such as Information Systems Journal, the European Journal of Information Systems, the Journal of Strategic Information Systems and Management Information Systems Quarterly Executive.

www.shortbio.net/sh.itm@cbs.dk