2008

Organisations and Vanilla Software: What Do We Know About ERP Systems and Competitive Advantage?

E Fosser
Agder University

O Leister
Agder University

CE Moe
Agder University

M Newman
Manchester Business School

ORGANISATIONS AND VANILLA SOFTWARE: WHAT DO WE KNOW ABOUT ERP SYSTEMS AND COMPETITIVE ADVANTAGE?

Erik Fosser, Ole Henrik Leister, Carl Erik Moe

Agder University, Kristiansand, Norway

Mike Newman

Manchester Business School

& NHH, Bergen, Norway

Abstract

Enterprise Resource Planning (ERP) systems have become a de facto standard for integrating business functions. But an obvious question arises: if every business is using the same so-called "Vanilla" software (e.g. an SAP ERP system) what happens to the competitive advantage from implementing IT systems? If we discard our custom-built legacy systems in favour of enterprise systems do we also jettison our valued competitive advantage from IT? While for some organisations ERPs have become just a necessity for conducting business, others want to exploit them to outperform their competitors. In the last few years, researchers have begun to study the link between ERP systems and competitive advantage. This link will be the focus of this paper. We outline a framework summarizing prior research and suggest two researchable questions. A future article will develop the framework with two empirical case studies from within part of the European food industry.

1. Introduction

An Enterprise Resource Planning (ERP) system is a multi-module transaction-based application software that helps organisations to manage the vital parts of the business. While ERP systems are often the preferred solution (Holland et al., 1999), many of the legacy systems they replaced offered a great deal of value from their unique, bespoke features. For example, when Dow Corning implemented SAP, they found that their staff headcount rose: features of their legacy systems offered more functionality than the ERP that replaced them (Ross, 1999). While there has been extensive research on the issues concerning implementing these systems and achieving the promised benefits, less research has been done on ERP systems in relation to competitive advantage (Kalling, 2003).

Different frameworks have been developed in this field of study defining competitive advantage (Mata et al., 1995; Porter, 1980; Porter, 1985). The latest contributions to the debate focus on the unique collection and dynamic management of an organisation's resources and its evolving capabilities (Beard and Sumner, 2004; Lengnick-Hall et al., 2004).

Many organisations invest vast amounts of resources in ERP solutions without analysing the linkage to competitive advantage. The fit between the ERP system and the organisation's strategy is often ignored. We have investigated how and to what extent a company could achieve a competitive advantage by using ERP. Is an ERP just another tool that is necessary to stay in the market, "the cost of doing business" (Kumar and van Hillergesberg, 2000)? Is, as Carr (2003) claims, IT irrelevant, or can IT give a substantial advantage when used effectively? How do some organisations outperform their competitors that use similar ERP systems? In this paper after summarizing prior research we outline a framework and we suggest two researchable questions to explore in our future empirical research.

2. Prior Research

2.1 ERP Systems

In their idealised form, Enterprise Resource Planning (ERP) systems integrate all business processes into one enterprise-wide solution. This is accomplished by having a centralised database that all business functional areas have access to (O'Leary, 2002). While it is possible to customise the ERP system to fit the original business processes, this is a contested area in both industry and academia: the current wisdom is that customisation is not recommended because of the high cost and problems with system upgrades and maintenance difficulties (Holland et al., 1999). This is one of the reasons why many consultant firms only deliver "vanilla implementations"[1]. Most ERP systems are built to be configurable and this is the preferable method for most organisations.

Value of ERP Systems

Prior research has pointed out different benefits of using such systems. Some researchers have claimed that ERP systems encourage economic growth, as measured by return on assets (ROA), return on investment (ROI), and asset turnover (ATO). Holland et al. (1999) argued that organisations do not implement ERP systems to achieve such benefits but rather to deal with their outdated legacy systems. Others have argued that ERP can be part of achieving a

[1] Standard, out-of-the-box implementations and configurations

competitive advantage in some situations (Beard and Sumner, 2004). Lengnick-Hall et al. (2004) claimed that ERP systems do not offer competitive advantages in themselves, but that they have to be combined with social and intellectual capital within the firm (Kalling, 2003; Mata et al., 1995; Powell and Dent-Miallef, 1997).

The reported benefits of ERP systems have been weakened by research conducted by Ernst and Young, which revealed that many utility companies attained less than 50% potential value from an ERP implementation (Holland and Skarke, 2001). However the veracity of these figures can be questioned (see McKeen et al., 1999).

Kumar et al. (2003) explain how ERP users have reported drawbacks with the lock-in of their organisation's processes and principles into a specific software solution. If the organisation fails to merge the business requirements and the technological aspects of the ERP system, there may be a conflict between the system logic and the business logic. If there are shortcomings in the service and product delivered, there may be an extensive switching cost as well as the costs to combine the ERP system with other software products (Pearlson and Saunders 2004).

2.2 Competitive Advantage

Beard and Sumner (2004) suggest that ERP systems may eliminate the competitive advantages that organisations possessed before the implementation of the ERP system. They labelled this the "Common System Paradox". This paradox has also been identified by other researchers (Lengnick-Hall et al., 2004; Markus and Tanis, 2000 and Newman and Westrup, 2006). Features that made the organisations unique and hard to imitate may be destroyed because of using a "vanilla" system.

The so-called five forces model (Porter, 1980) displays the competitive environment the organisations compete in. Porter also claimed that there are only two generic strategies to obtain competitive advantage: 1) differentiation and 2) cost-leadership. A limitation of this framework is Porter's focus on industry and the neglect of the firm's internal strengths and weaknesses including its IT systems (Kalling, 1999). In 1985, Porter published a new framework, the value chain, which focused on competitive advantage from an internal perspective of the organisation (Porter, 1985).

Porter argues that effective control and structure of these activities can enable organisations to deploy one of the two generic strategies described above. However, it does not take into account the specific and unique nature of the firm (Kalling, 1999). Processes that build up the structures, abilities and resources that allowed the organisation to perform one of the two generic strategies are not considered.

A new approach to competitive advantage has emerged in the last ten years called the resource-based view and this focuses on the resources behind the generic strategies. In this view, resources that enable an organisation to perform specific strategies are emphasised (Kalling, 1999). Wernerfelt's paper "*A Resource-based View of the Firm*" (1984) won the prize for the most influential papers published in Strategic Management Journal prior to 1990, and it suggested that firms should switch to *resources* rather than *products* (Wernerfelt, 1984, 1995).

In this paper we use the resource-based view to define competitive advantage, building on two basic assumptions: the resources and the capabilities possessed by competing firms may differ (resource heterogeneity) and these differences may be long lasting (resource immobility) (Mata et al., 1995).

Mata and his colleague's framework (figure 1) has been used to define competitive advantage of IT in general (Mata et al., 1995; Powell and Dent-Micallef, 1997). It is built up of three basic criteria (or questions) that highlight the importance of the resource.

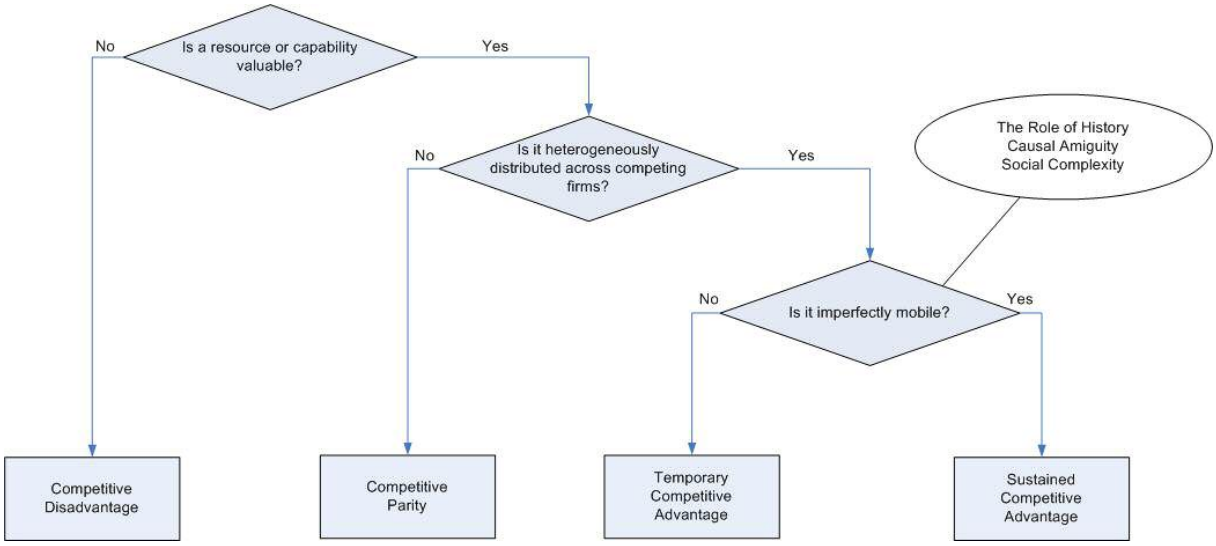

Figure 1: Resource-Based Model of Competitive Advantage (after Mata et al., 1995)

The first criterion in the framework is: Does a particular resource add value to the firm? This question is related to the possibility to reduce costs or increase revenue by product differentiation when exploiting the resource. The second criterion in the framework is: Is a particular resource or capability heterogeneously distributed across competing firms? If all firms have access to the same resources, the resources will not give a competitive advantage. It will most likely result in competitive parity. The third criterion in the framework is: Is a resource or capability imperfectly mobile? If firms without valuable resources have no problem in acquiring, developing, and using it compared with firms that already possess this resource, then it will only be a source of temporary competitive advantage for the firms that originally controlled it. If a resource is hard to imitate, the firms that control this resource are in a position to achieve a sustainable competitive advantage through this resource.

Earlier research showed that the immobility criterion is often based on three conditions. These conditions make it hard, if not impossible, for competitors to imitate the resources (Barney, 1991). The three conditions are presented below:

- The role of history. A firm may be in the right place at the right time for acquiring and developing an important resource. Some resources can also only be developed over longer periods of time. Ebay.com, for example, was the first major mover in the development of internet-based auction software and has become highly successful in this domain. Amazon.com developed auction software later and has struggled to compete with Ebay.

- Causal ambiguity. The resources can be taken for granted but are not codified. They are invisible assets and are therefore a tacit capability of the organisation. The resource can be made up of many small decisions and actions that are hard to monitor. Competitors will not know what to imitate.

- Social complexity. A resource may be so intertwined in social networks, cultures, relationships and so on, that it will be very hard for a competitor to deconstruct the social structures.

Extensions to this framework have been made in later years (Kalling, 1999; Kalling, 2003; Beard and Sumner, 2004; Lengnick-Hall et al., 2004). The extensions are aimed at organisational and business resources that can lead to a competitive advantage based on ERP systems. The framework has been widely used in earlier research and has proved its value in the field of ERP and IT in general (Kalling, 1999).

Kalling (2003) extended the framework with the question: Is the firm organised to exploit the full competitive advantage of the resource (e.g. an ERPs)? This extension focuses on the organisational fit and management issues that are needed to derive the benefits from the resource (an ERP system). This extra criterion has also found favour with other researchers (Beard and Sumner, 2004; Ciborra and Jelassi, 1994).

While we acknowledge the weaknesses of the resource-based view, we argue (above) that the framework is relevant for our paper and we will use it to define the term competitive advantage.

2.3 Managerial Issues Concerning ERP systems and Creating Competitive Advantage

There is a paucity of research on the topic of managerial issues arising from the deployment of ERP systems and creating a competitive advantage (Mata et al., 1995; Beard and Sumner, 2004; Kalling, 1999). The few studies that exist treat the issue of gaining competitive advantage in a relatively simplistic fashion (Kirchmer, 1998). Mata et al. (1995) used the resource-based view of the firm to find out if four proposed attributes of IT could be a source of a sustainable competitive advantage. The four attributes of IT are capital requirements, proprietary technology, technical IT skills and managerial IT skills. However, their study (Mata et al., 1995) was theoretical: it reviewed prior research. They argued that the only attribute that is expected to create a competitive advantage is managerial IT skills. Managerial IT skills include management's ability to conceive of, develop, and exploit IT applications to support and enhance other business functions. **Thus the real value is not the ERP system in itself, but the way the managers exploit it** (c.f. Barley, 1990).

Beard and Sumner (2004) also used a resource-based view when they attempted to see if an ERP system could create a competitive advantage in itself. Their conclusions using the four criteria in the framework are summarized next.

Is the resource or capability valuable? There was no evidence that showed that ERP systems reduced costs. Most of the benefits of the ERP systems were in the "value-added" category. *Is the resource or capability heterogeneously distributed across competing firms?* It was argued that ERP systems were heterogeneously distributed within some industries, but not in other industries such as oil, chemicals and technology, where ERP systems were becoming "standard" due to the common system approach. ERP systems could therefore be used to achieve a temporary competitive advantage at best, but most often they achieve competitive parity only. *Is the resource or capability imperfectly immobile?* Being an early adopter can give a temporary competitive advantage, but this benefit is eroded over time. This is due to the "lessons learned" by the pioneers of ERP implementation. ERP systems are increasingly imitable and create only a temporary competitive advantage at best. *Is the firm organized to exploit the full potential of the resource or capability?* Successful project planning, implementation, alignment and utilization of the ERP system may be a source of competitive advantage. This means that the management of the ERP project and subsequent operations should be in focus. Successful Business Process Reengineering (BPR) projects to facilitate the fit between the system and the organisation were also argued to be important. This conclusion by Beard and Sumner (2004) has been supported by other researchers on the topic (Mata et al., 1995; Somers and Nelson, 2003). Along these lines, ERP suppliers promote what they

claim to be “best practices” for a particular industry. These are process templates which, if followed carefully, are claimed to enable organisations to transform their businesses and become more effective (Ross, 1999). However, this “vanilla process” approach has recently been challenged as flawed (Van Stijn and Wensley, 2005; Wagner et al., 2006).

Lengnick-Hall et al. (2004) arrived at the same conclusions as Beard and Sumner (2004) considering the first three criteria in Mata et al.’s framework (1995, see figure 1). They extended the framework by analysing the robustness of the ERP system as a resource, the exploitation of the ERP system and the possibility to leverage other resources using an ERP system. They argued that an ERP system was a robust resource since it was strong on the implementation of short term tactics. This was enabled by the accurate, real-time assessment of organisational choices and activities produced by the ERP system. However, long-term tactics were often hampered by ERP systems, because of the strict formalization of processes (see also Newman and Westrup, 2006). They argued that mechanistic organisations dominated by programmed technologies and operations had the best fit. However, non-routine, learning and self organized organisations were the ones that benefit the most from the ERP systems’ output. To reconcile this paradox they proposed a dual core structure based on Daft’s (1978) earlier work. Daft argued that innovation arises from both the technical and the administrative (strategic) core. Lengnick-Hall et al., (2004) argued that ERP exploitation should focus on building new organisational structures, processes, procedures, policies and cultures based on the outcome of the ERP system. The outcome should enable the management to learn about the system and their organisation. This could be used to make adjustments which later could result in a competitive advantage.

Andreau and Ciborra (1996) focused on how learning took place within the organisational context of the business. A comprehensive learning process is hard to imitate. It will then be the basis for a sustainable advantage. Making this happen is a management activity. The authors developed their model, “The strategic learning loop” which consisted of three loops. The first loop explains how core capabilities, business mission, capabilities and competitive environment are linked together and affect each other. The second loop is the capability learning loop. The loop focuses on the need for new organisational routines and how work practices use existing organisational routines to develop new capabilities. The third loop is the routinisation learning loop which looks at the need for new resources by taking advantage of existing work practices. All these loops are linked together in an organisational context. The model (Figure 2) creates the basis for how IT can be developed from just being a resource to becoming a key component of core capabilities. It is especially related to Strategic IS as they could be part of shaping core capabilities in the organisations (Kalling, 2003).

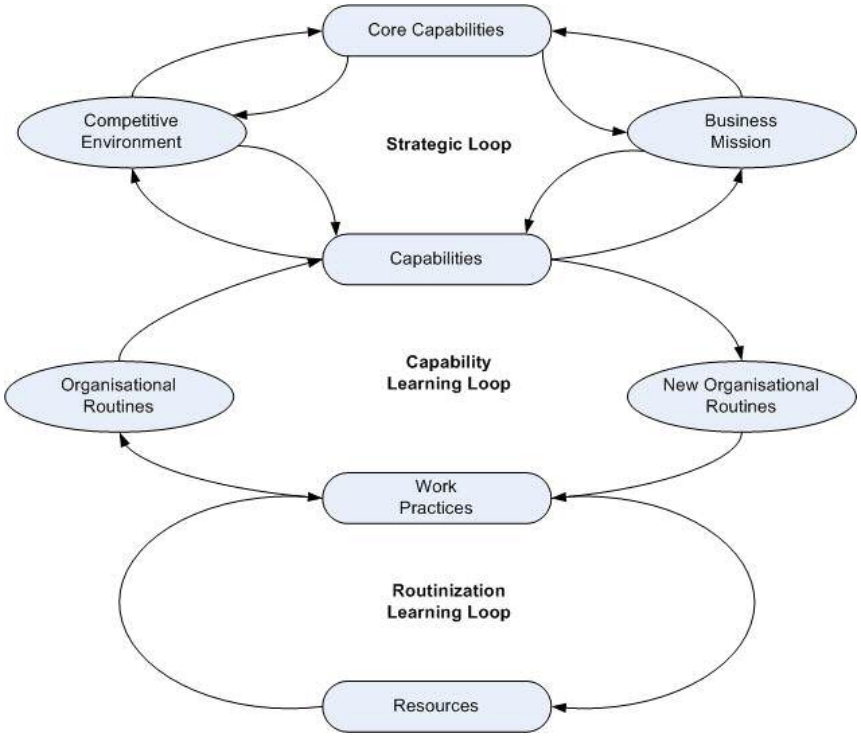

Figure 2: A simplified model of the strategic learning loop in an organizational context (Andreau and Ciborra, 1996)

The model can be used to explain how IT contributes to an organisation's competitiveness. Andreu and Ciborra (1996) present some guidelines to embed IT into core capabilities that are very alike the framework (Figure 1) used by many other researchers (Mata et al., 1995; Kalling, 2003; Beard and Sumner, 2004), and their conclusions are similar.

Powell and Dent-Micallef (1997) highlighted the importance of combining IT in general with human and business resources. They found that human resources are more important than business resources to leverage the potential of IT. The human resources described above look like resources that belong in the "non-routine, learning and self organized organisation" presented in Lengnick-Hall et al.'s (2004) dual core concept. Powell and Dent-Micallef's (1997) final conclusion was that the only way to achieve a competitive advantage is to leverage and exploit firm-specific, intangible resources like flexible culture, strategic planning, IT integration (human resources) and supplier relationships (business resource).

The field of knowledge management has also made some contributions to the debate (Hitt et al., 2000; Ndlela and du Toit, 2001; Gottschalk, 2003). While there is no focus on ERP systems or IT generally, there are many similarities with Kalling's (2003) sub processes, which are described below. Hitt et al. (2000) argued that organisations have to create, transfer and apply knowledge to achieve a competitive advantage. This view echoes the learning perspective of Andreu and Ciborra (1996). Hitt et al. (2000) claimed that creating core capabilities is the only way to deal with the uncertain, dynamic and volatile competitive landscape. Ndlela and du Toit (2001) and Gottschalk (2003) also identified the importance of recognising and rediscovering resources the enterprise already has, but which are not utilized to the full potential. Knowledge-based resources are also difficult to copy because of their complexity.

Kalling (2003) focused on how ERP systems and strategic management processes can lead to a competitive advantage. Again, the basis for this work is the *resource-based view*. The author suggested a framework to improve the understanding of the processes that

organisations initiate to achieve competitive advantage using an ERP system. It focuses on the process of building competitive advantage from the output of the system. According to Kalling, this is a process of five major tasks; identification, development, protection, internal distribution, and usage. Organisations should concentrate more on changing their strategy and structures, than focus explicitly on optimising the system. Kalling further claimed that ERP-based competitive advantages arise from both interdependent development of the system and the way it is used. The framework is presented below (Figure 3).

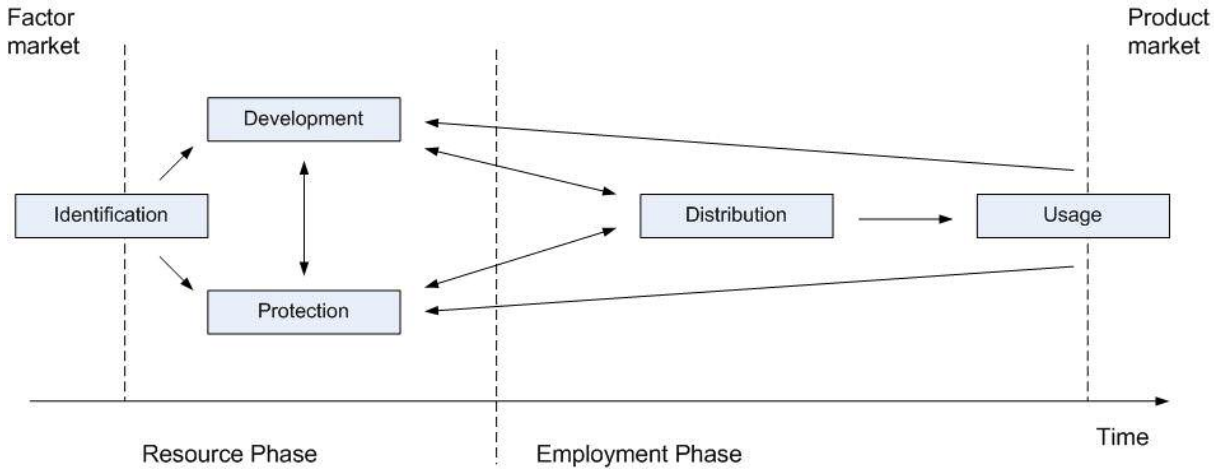

Figure 3: Conceptual framework for systems resource management processes (Kalling, 2003)

The framework was constructed from a case study where an organisation implemented an in-house developed ERP system. During a personal communication with Kalling (13.01.2005), he also argued that the framework could be seen as a life-cycle process. Changes to ERP systems have to be executed all along: both the system and the organisation are subject to management. He also argued that systems are not changed or modified in synchronization with the organisation to the extent that one would expect. Changes are constrained by rigid contracts with vendors and consultants – and by the inertia of the organization.

Kalling's (2003) contribution can be seen as vital since he described the entire process from identifying to using strategically important resources. Important managerial processes can be mapped and organised using this framework. However, this framework would be hard to test empirically (through interviews, for example): managers may not be able to see these processes *in situ*.

E-commerce, supply chain management (SCM), customer relationship management (CRM) and data warehousing are all concepts and technologies that are used to extend ERP systems. A combination of these concepts is often called an ERP suite. The combination of ERP systems, e-commerce and various extensions (so-called bolt-ons) offers the possibility of at least temporary competitive advantage (Shoemaker, 2001; Yen et al., 2002; Unal, 2000; Rich and Hines, 1997; Bendoly and Kaefer, 2004; Turban et al., 2004; Guptaa and Kohli, 2004; Vassiliadis et al., 2001) and should be included in frameworks for analysing competitive advantage from ERP systems.

3. Discussion and Developing a Framework and Research Questions

In summary, an ERP system alone does not create a sustainable competitive advantage (Mata et al., 1995; Beard and Sumner, 2004; Lengnick-Hall et al., 2004; Powell and Dent-Micallef, 1997; Holland et al., 1999). However, managers can initiate processes based on the output of

the ERP-system that can result in a competitive advantage (Beard and Sumner, 2004; Lengnick-Hall et al., 2004). These processes are driven by important resources to gain a sustainable competitive advantage (Kalling, 2003).

Many of the studies above argue that it is important to have an open environment built on trust in the organisation (Lengnick-Hall et al., 2004; Powell and Dent-Micallef, 1997). Ideally, the innovative organization which sits on top of the "mechanistic" ERP system should focus on open communication, consensus, alignment and flexibility (Powell and Dent-Micallef, 1997). This can lead to creative thinking and learning that again can foster new innovative processes and structures (Kalling, 2003; Ciborra, 1991; Andreu and Ciborra, 1996). However, this is rather a homogeneous solution to what is a complex and varied problem: organisations and contexts differ and solutions and adaptations of ERP systems will vary accordingly (Hardy, 1994; Grant et al., 2006).

Knowledge derived from the understanding of the two cores (Daft, 1978) could be used to create a competitive advantage (Hitt et al., 2000; Ndlela and du Toit, 2001; Gottschalk, 2003). Managers can foster an awareness of the creation, distribution and usage of this knowledge (Hitt et al., 2000; Kalling, 2003). The process of accumulating and understanding this knowledge can be seen as a learning process (Andreu and Ciborra, 1996). The notion that ERP systems can be merely configured is being challenged as simplistic (Light and Wagner, 2006; Grant et al., 2006). Learning through trial and error ("bricolage") and local tinkering has to be understood as strategically important (Ciborra, 1991; Ciborra and Jelassi, 1994; Powell and Dent-Micallef, 1997; Kalling, 2003).

To summarise the above discussion, we outline the components a framework based on our findings from the literature. We have categorised these concepts into ***four research domains***: competitive advantage, organizational capabilities for competitive advantage, system foundations for competitive advantage and processes. ***Competitive advantage*** includes findings concerning benefits and drawbacks of ERP systems, what has been termed the "common system paradox" and findings concerning whether ERP systems have impacted competitive advantage. ***Organizational capabilities for competitive advantage*** are to be understood as facilities that research has shown needs to be present to achieve competitive advantage with an ERP implementation. These include managers' knowledge of the organisation and the ERP system, top management support, open and flexible culture, training, learning (bricolage) and communication as well as a business competent IT/IS department and organisational structures and processes. ***A systems foundation*** includes the implementation and use of the system and includes topics such as creative usage, extraction of information and extensions or so-called "bolt-ons" to the system. Finally ***processes*** include planning for achieving competitive advantage, dealing with hurdles encountered including escalation of resources, focusing on the future and the managers' competitive advantage process in general. However, as most of this research is purely theoretical we need empirical data. A future article will therefore ground this framework through two empirical case studies in a part of the European food industry. For this our guiding research questions will be:

- *How do organisations achieve competitive advantage even if they use the same ERP-systems?*

- *What resources or capabilities do organisations use to achieve competitive advantages through ERP-systems with special attention to:*

    - *Managerial processes*
    - *Managerial skills*
    - *Strategies*
    - *System foundations?*

References

Andreu, R. and Ciborra, C. (1996). Organisational Learning and Core Capabilities Development: The Role of IT. Journal of Strategic Information Systems, Vol. 5, Issue 2, pp. 111-127.

Barley, Stephen R. (1990). The Alignment of Technology and Structure through Roles and Networks, Administrative Science Quarterly, 35, Issue 1, pp. 61-103.

Barney, J.B. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, Vol. 17, Vol. 1, pp. 99-120.

Beard, J.W. and Sumner, M. (2004). Seeking Strategic Advantage in the Post-Net Era: Viewing ERP Systems from the Resource-Based Perspective. The Journal of Strategic Information Systems, Vol. 13, Issue 2, pp. 129-150.

Bendoly, E. and Kaefer, F. (2004). Business Technology Complementarities: Impacts of the Presence and Strategic Timing of ERP on B2B E-commerce Technologies Efficiencies. The International Journal of Management Science, Vol. 32, Issue 5, pp. 395-405.

Carr, N. (2003) IT Doesn't Matter. Harvard Business Review, May, 81(5): 41-49.

Ciborra, C. (1991). From Thinking to Tinkering: The Grassroots of Strategic Information Systems. (Eds) Janice I. DeGross, Izak Benbasat, Gerardine DeSanctis, Cynthia Beath. International Conference on Information Systems. New York.

Ciborra, C. and Jelassi, T. (1994). Strategic Information Systems: A European Perspective. John Wiley and Sons Ltd., Chichester.

Daft, R.L. (1978). A Dual Core Model of Organisational Innovation. Academy of Management Journal. Vol. 21, Issue 2, pp. 193-210.

Gottschalk, P. (2003). Ledelse av Intelektuell Kapital. Universitetsforlaget, Oslo.

Grant, D., Hall, R., Wailes, N. and Wright. C.(2006). "The False Promise of Technological Determinism: The Case of Enterprise Resource Planning Systems." New Technology, Work and Employment 21(1): 2-15.

Guptaa, M. and Kohli, A. (2004). Enterprise Resource Planning Systems and its Implications for Operations Function. Technovation.

Hardy, C. (1994) Managing Strategic Action. London: Sage Publications

Hitt, M.A., Ireland, R.D. and Lee, H. (2000). Technology Learning, Knowledge Management, Firm Growth and Performance: An Introductory Essay. Journal of Engineering and Technology management, Vol. 17, Issue 3-4, pp. 231-246.

Holland, C., Light, B. and Kawalek, P. (1999). Beyond Enterprise Resource Planning Projects: Innovative Strategies for Competitive Advantage. Proceedings of the 7th European Conference on Information Systems, Vol. 1, pp. 288-301.

Holland, C. P. and Light, B. (1999). A Critical Success Factors Model for ERP Implementation. IEEE Software, 16 (3), 30-36.

Holland, W. & Skarke, G. (2001). Is your IT system VESTed? Strategic Finance, Vol. 83, Issue 6, pp. 34-38.

Kalling, T. (1999). Gaining Competitive Advantage through Information Technology: A Resource-Based Approach to the Creation and Employment of Strategic IT Resources. Lund Business Press, Lund.

Kalling, T. (2003). ERP Systems and the Strategic Management Processes that Lead to Competitive Advantage. Information Resources Management Journal, Vol. 16, Issue 4, pp. 46-67.

Kirchmer, M. (1998). Business Process Oriented Implementation of Standard Software: How to Achieve Competitive Advantage Quickly and Efficiently. Springer, Berlin.

Kumar, K. and van Hillergesberg, J. (2000) ERP Experiences and Evolution. Communication of the ACM, vol. 43, n 4, 23-26.

Kumar, V., Maheshwari, B. and Kumar, U. (2003). An Investigation of Critical Management Issues in ERP Implementation: Emperical Evidence from Canadian Organisations. Technovation, Vol. 23, Issue 10, pp. 793-807.

Lengnick-Hall, C.A., Lengnick-Hall, M.L. and Abdinnour-Helm, S. (2004). The Role of Social and Intellectual Capital in Achieving Competitive Advantage through Enterprise Resource Planning (ERP) Systems. Journal of Engineering and Technology Management, Vol. 21, Issue 4, pp. 307-330.

Light, B. and E. L. Wagner (2006). "Integration in ERP Environments: Rhetoric, Realities and Organisational Possibilities." New Technology, Work and Employment 21(3): 215-228.

Markus, M.L. and Tanis, C. (2000). The Enterprise Systems Experience – From Adoption to Success, Zmud, R.W. (Ed.) Framing the Domains of IT Research: Glimpsing the Future through the Past. Pinnaflex Educational Resources, Cincinnati.

Mata, F.J., Fuerst, W.L. and Barney, J.B. (1995). Information Technology and Sustaining Competitive Advantage: A Resource-based Analysis. MIS Quarterly, Vol. 19, Issue 4, pp. 487-505.

McKeen, J.D., Smith, H.A. and Parent, M. (1999). An Integrative Research Approach to Assess the Business Value of Information Technology. Mahmood, M.A. and Szewczak, E.J. (eds). Measuring Information Technology Investments Payoff: Contemporary Approaches. Iean Group Publishing, Hershey, USA.

Newman, M. and Westrup, C., (2006) "Making ERPs Work: Accountants and the Introduction of ERP Systems". European J. of Information Systems Vol. 14, Issue 3 pp. 258-272.

Ndlela, L.T. and de Toit, A.S.A. (2001). Establishing a Knowledge Management Programme for Competitive Advantage in an Enterprise. International Journal of Information Management, Vol. 21, Issue 2, pp. 151-165.

O'Leary, D.E. (2002). Enterprise Resource Planning Systems: Systems, Life Cycle, Electronic Commerce and Risk. Cambridge University Press, Cambridge.

Pearlson, K.E., and Saunders, C.S. (2004). Managing and Using Information Systems (2nd ed.). Leyh Publishing LLC, New Caledonia.

Porter, M.E. (1980). Competitive Strategy. Free Press, New York.

Porter, M.E. (1985). Competitive Advantage. Free Press, New York.

Powell, T.C. and Dent-Micallef, A. (1997). Information Technology as a Competitive advantage: The Role of Human, Business and Technology Resources. Strategic Management Journal, Vol. 18, Issue 5, pp. 375-405.

Rich, N. and Hines, P. (1997). Supply Chain Management and Time Based Competition: The Role of the Supplier Association. International Journal of Distribution and Logistics Management, Vol. 27, Issue 3-4, pp. 210-225.

Ross, J. (1999). Dow Corning Corporation: business processes and information technology. Journal of Information Technology, Vol. 14, 253-266.

Shoemaker, M.E. (2001). A Framework for Examining IT-Enabled Market Relationships. Journal of Personal Selling and Sales Management, Vol. 21, Issue 2, pp. 177-185.

Somers, T.M. and Nelson, K.G. (2003). The Impact of Strategy and Integration Mechanisms on Enterprise Systems Value: Empirical Evidence from Manufacturing Firms. European Journal of Operational Research, Vol. 146, Issue 2, pp. 315-228.

Turban, E., King, D., Lee, J.K. and Viehland, D. (2004). Electronic Commerce 2004: A managerial perspective. Prentice Hall, USA.

Unal, A. (2000). Electronic Commerce and Multi-Enterprise Supply/Value/Business Chains. Information Sciences, Vol. 127, Issue 1-2, pp. 63-68.

Van Stijn, E., and Wensley, A (2005): ERP's best Practices and Change: An Organisational Memory Mismatch Approach. Proceedings of the 13th European Conference on Information Systems, Regensburg, Germany, May 26-28.

Vassiliadis, P., Quix, C., Vassiliou, Y. and Jarke, M. (2001). Data Warehouse Process Management. Information Systems, Vol. 26, Issue 3, pp. 205-236.

Wagner, Erica L. and Scott, Susan V. and Galliers, Robert D. (2006) The creation of best practice software: myth, reality and ethics. Information and organisation, 16 (3). pp. 251-275.

Wernerfelt, B. (1984). A Resource-based View of the Firm. Strategic Management Journal, Vol. 5, Issue 2, pp.171-180.

Wernerfelt, B. (1995). The Resource-based View of the Firm: Ten Years After. Strategic Management Journal, Vol. 16, Issue 3, pp. 171-174.

Yen, D.C., Chou, D.C. and Chang, J. (2002). A Synergic Analysis for Web-based Enterprise Resources Planning Systems. Computer Standards and Interfaces, Vol. 24, Issue 4, pp. 337-346.