Competitive Advantage and Enterprise Resource Planning Systems: Some Conflicts in the Value-Chain

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ABSTRACT

Whether an organization gains a competitive advantage (CA) from an enterprise resource planning (ERP) system is a topic of much debate in the literature. However, when we differentiate between the stakeholders in the ERP value-chain and their relative CA positions, the literature is curiously silent. We depict the ERP value-chain as having three stakeholders: an ERP vendor, an ERP partner or re-seller, and the ERP end-users or client. The paper suggests how the interests these stakeholders have in maintaining or improving their CA in their own markets is complex and in some circumstances may hinder the development of future ERPs. This paper formulates a set of propositions to address this gap in our knowledge. We close the paper by proposing eight scenarios and suggesting how these and our propositions may be explored empirically.

Keywords

Competitive Advantage; Enterprise Resource Planning (ERP); ERP Development; Resource-Based View; Value-Chain.

INTRODUCTION

Competitive Advantage and how organizations gain CA from information and communication technologies (ICTs) are subjects that have been discussed extensively. There are different opinions on the answer to the question as to whether ICTs enable organizations to gain CA. Some proponents, such as Carr (2003), claim that the technology is irrelevant since it can be treated as a commodity. Others, such as Tapscott (2004), states its importance while others say it depends on how the technology is used and that it is business processes that that are primary (Smith et al. 2003). However, reviewing the academic literature there seems to be a common understanding that it is not the technology as such that eventually provides organizations with CA but how the technology is used (Mata et al. 1995).

However, in this paper we discuss another perspective of CA in relation to ERPs, and that is how the ERP value-chain stakeholders’ interest in maintaining or improving their CA may hinder the development of future ERPs. When we differentiate between the stakeholders in the ERP value-chain and their relative positions the subject becomes more complex. We develop a set of propositions and a table suggesting what it is that gives stakeholders in the ERP value-chain their CA. The table and the propositions are then discussed using some preliminary findings from a larger empirical study. The rest of the paper is organized as follows: The next section defines ERPs and describes the ERP value-chain and its stakeholders. We then define CA and describe ERPs and CA from the resource-based view of the firm perspective. This is followed by a presentation of the propositions and a table suggesting CA scenarios in relation to the different stakeholders in the ERP value-chain. Finally we present eight scenarios and suggest directions for future research.

ERPs, THE ERP VALUE-CHAIN AND ITS STAKEHOLDERS

ERPs are often defined as standardized packaged software designed with the aim of integrating the entire value-chain in an organization (Lengnick-Hall et al. 2004; Rolland et al. 2000). Wier et al. (2007) argue that ERPs aim at integrating business processes and ICT into a synchronized suite of procedures, applications and metrics which transcend organizational boundaries. Kumar and van Hillegersberg (2000) claim that ERPs that originated in the manufacturing industry were the first generation of ERPs. Development of these first generation ERPs was an inside-out process proceeding from standard inventory control (IC) packages, to material requirements planning (MRP), material resource planning (MRP II) and then eventually expanding it to a software package to support the entire organization (second generation ERPs). This evolved software package is then described as the next generation ERP labeled as ERP II which, according to Møller (2005), could be described as the next generation enterprise systems (ES).
This evolution has increased the complexity not only of usage, but also in the development of ERPs. The complexity comes from the fact that ERPs are systems that are supposed to integrate the organization (both inter-organizationally as well as intra-organizationally) and its business processes into one package (Koch 2001). It can be assumed that ERPs as well as how organizations use ERPs have evolved significantly from a focus on manufacturing to include service organizations (Botta-Genoulaz et al. 2006). These changes have created a renewed interest in developing and selling ERPs. Thus, the ERP market is a market that is in flux. This impacts not only the level of stakeholder involvement in an ERP value-chain (Ifinedo et al. 2007; Somers et al. 2004), but also how these different stakeholders gain CA from developing, selling, or using ERPs. It is clear that a user organization no longer achieves CA just by implementing an ERP (Karimi et al. 2007; Kocakulah et al. 2006). Fosser et al., (2008a) present evidence that supports this and at the same time show that for some organizations there is a need to implement an ERP system for at least achieving competitive parity. They also claim that the way the configuration and implementation is accomplished can enhance the possibility to gain CA from an ERP system, but an inability to exploit the ERP system can bring a competitive disadvantage. This is in line with the assumption from the resource-based view that it is utilization of resources that makes organizations competitive and just implementing ERPs provides little, if any, CA at all (Mata et al. 1995). One reason for this could be that the number of organizations that have implemented ERPs has exploded. Shehab et al. (2004) claim that the price of entry for running a business is to implement an ERP, and they even suggest that it can be a competitive disadvantage if you do not have an ERP system. Beard and Sumner (2004) argue that through reduction of costs or by increasing organizations revenue, ERPs may not directly provide organizations with CA. Instead, they suggest that advantages could be largely described as value-adding through an increase of information, faster processing, more timely and accurate transactions, and better decision-making.

The development of ERPs can be described as a value-chain consisting of different stakeholders, as shown in Figure 1. The value-chain can be seen as the ERP business model that has at least three different stakeholders: ERP software vendors, ERP resellers/distributors, and ERP end-user organizations (or ERP customers). It can be said that all stakeholders in the value-chain, to some extent, develop the ERP further. The software vendors develop the core of the system that they then “sell” to their partners that act as resellers or distributors of the specific ERP. These partners quite often make changes to the system or develop what could be labeled as add-ons to the ERP core. These changes or add-ons are then implemented in order to customize the ERP for a specific customer. In some cases the customer develops the ERP system further either by configuration or customization. At this stage of the value-chain it can be argued that the “original” ERP system could have changed dramatically from its basic design. This ERP development value-chain may result in the ERP software vendors not having as close a connection to the end-user that they would choose and do not always understand what functionalities are added to the end-users’ specific ERP systems.

The stakeholders in the ERP value-chain have different roles; accordingly, they have different views of CA gained from ERPs. One way of describing this is to use a concept from the resource-based view: core competence (Javidan 1998). Developing ERPs are normally the ERP software vendors’ core competence. The ERP reseller/distributors’ core competence should also be closely related to ERPs, but it is unclear if development should be their core competency. Their core competences could or should be marketing and implementing ERPs. However, this probably varies between ERP resellers/distributors; for some it could be development of add-ons that constitute one of their core competences. When it comes to end-user organizations, it can be said that ERP development definitely does not constitute their core competence. However, they are involved in the ERP development value-chain. To further discuss this we describe ERPs and CA from the resource-based view of the firm in the next section.

Figure 1 Stakeholders in the ERP value-chain

The stakeholders in the ERP value-chain have different roles; accordingly, they have different views of CA gained from ERPs. One way of describing this is to use a concept from the resource-based view: core competence (Javidan 1998). Developing ERPs are normally the ERP software vendors’ core competence. The ERP reseller/distributors’ core competence should also be closely related to ERPs, but it is unclear if development should be their core competency. Their core competences could or should be marketing and implementing ERPs. However, this probably varies between ERP resellers/distributors; for some it could be development of add-ons that constitute one of their core competences. When it comes to end-user organizations, it can be said that ERP development definitely does not constitute their core competence. However, they are involved in the ERP development value-chain. To further discuss this we describe ERPs and CA from the resource-based view of the firm in the next section.

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1 This is the MicroSoft business model. While SAP does not use resellers, they use partners that provide, in some cases, extensive support for ERP customers.
ERP AND COMPETITIVE ADVANTAGE SEEN FROM THE RESOURCE BASED VIEW

As Mata et al. (1995), as well as Kalling (1999) claim, whether an organization (the customer in figure 1) gains CA from software applications depends on how these resources are managed. The conclusion Mata et al. (1995) draw is that among attributes related to software applications – capital requirements, proprietary technology, technical skills, and managerial software applications skills – it is only the managerial software application skills that can provide sustainability of CA. Barney (1991) concludes that sources of sustained CA are and must be focused on heterogeneity and immobility of resources. This conclusion is made from the assumption that if a resource is evenly distributed across competing organizations and if the resource is highly mobile, the resource does not produce a sustained CA.

Mata et al., (1995) suggested the diamond diagram, Figure 2, using Barney’s (1991) notions about CA and ICT in general. The framework has been used extensively (Beard et al. 2004; Fosser et al. 2008b; Kalling 1999; Lengnick-Hall et al. 2004) What the research implies is that CA can be difficult but not impossible to achieve if the resource is difficult to reproduce (e.g. the role of history, causal ambiguity and social complexity). Fosser et al., (2008b) conclude that the real value of the resource is not the ICT in itself, but the way the managers exploit it. We will explore this in more depth in relation to ERP by describing the resource-based view of the firm and the value, rareness, imitability and organization (VRIO) framework.

Quinn and Hilmer (1994) argue that organizations can increase the CA by concentrating on resources which provide unique value for their customers. Based on the discussion above and the statement made by Quinn and Hilmer (1994), Table 1 suggests what the CA is and how it is gained by different stakeholders in the ERP development value-chain including the end-user.

There are many different definitions of CA; however, a basic definition is that the organization achieves above normal economic performance. If this situation is maintained, the CA is deemed to be sustained. There are some conflicts between attributes for gaining CA, such as developing competitively priced software with high flexibility and developing software that is easy to customize and, at the same time, achieve CA by developing exclusive add-ons.

If the organization is a first mover in the sense that it is the first organization that uses this type of resource in a specific way, it can quite easily gain CA, but it will probably only be temporary. The length of time that the CA lasts depends on how hard or expensive it is for others to imitate the usage of that resource. This means that the question of how resources are exploited by the organization is the main factor when it comes to whether the CA becomes sustainable or not.

Levina and Ross (2003) describe the value proposition in outsourcing from a vendor’s perspective. They claim that the value derived from vendors is based on their ability to develop complementary core competencies. From an ERP perspective, we suggest that vendors, as well as distributors (Figure 1) provide value by delivering complementary core competencies to their customers. The evolution of ERPs has made these resources easier to imitate. However, a major barrier to imitation is the cost of implementation.
Table 1 ERP value-chain stakeholders and competitive advantage

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Competitive Advantage</th>
<th>Gained through</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ERP Software Vendor</strong></td>
<td>High level of market share in the ERP market (e.g. the number of software licenses sold)</td>
<td>Competitively priced software</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Highly flexible software</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ease of implementing the software</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ease of customizing the software</td>
</tr>
<tr>
<td><strong>ERP Resellers/distributor</strong></td>
<td>High level of market share in the ERP consultancy market (e.g. consultancy hours delivered)</td>
<td>Knowledge about the customer’s business</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High level of competence in development of add-ons that are seen as attractive by the ERP end-user organization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High level of competence at customization</td>
</tr>
<tr>
<td><strong>ERP end-user organization</strong></td>
<td>High level of market share in the customer-specific market (e.g. products or services sold; rising market share; lower costs)</td>
<td>Being competitive in its market</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implementing an ERP system that supports its business processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implementing an ERP system that is difficult for competitors to reproduce</td>
</tr>
</tbody>
</table>

The resource-based view claims that a resource has to be rare or, as described by Mata et al., (1995) in figure 2, be heterogeneously distributed, to provide CA. In the case of ERPs, this kind of resource is not rare. There are a lot of different possibilities for organizations to implement ERPs, and the evolution of ICT has made it more feasible for more organizations to implement ERPs, that is, by decreasing the costs of using ERPs. However, as described by Barney (2002) and Shehab et al. (2004), failure to implement an ERP can also lead to an organization suffering competitive disadvantages.

The CA from ERPs would probably be negated by duplication as well as by substitution. If, for instance, the ERP resellers sold their add-ons to the ERP software vendor, the duplication of that add-on would be quicker and the CA that the ERP reseller previously had would be gradually eroded. However, if they kept the add-on as “their” solution, other ERP resellers or ERP software vendors would probably find a substitute to the add-on or develop their own.

This implies a conflict between vendors and resellers when it comes to CA and the development of “better” ERPs. This can be explained by realizing that ERP resellers/distributors often develop add-ons which have a specific functionality for solving a particular problem for their customer. This can be seen as one way of customization, where resellers/distributors use their domain knowledge about the customers’ industry in addition to their knowledge about the specific customer. This, in effect, allows resellers to increase their CA and earn abnormal returns. Another way is for resellers to sell the add-on to other resellers resulting in the resellers decreasing their CA in the long run. It is probable that resellers who sell their add-on solutions to other resellers would see it as not influencing their CA since they sell the add-on to customers already using the same ERP system and this would not make ERP end-user organizations change resellers. However, the question remains whether the same would apply if the resellers sold the add-on to the software vendor. The answer would depend on the incentives that the resellers had for doing that. If the add-ons were to be implemented in the basic software, the possibility of selling the add-on to client organizations, as well as to other resellers, would disappear.

Beard and Sumner (2004) investigate whether a common systems approach for implementing ERPs can provide a CA. The focus of their research was to investigate what happens when a variety of firms within the same industry adopt the same system and employ almost identical business processes. Their conclusion is that it seems that ERPs are increasingly a requirement for staying competitive (i.e. competitive parity), and that ERPs can yield at most a temporary CA. From this it can be suggested that ERP end-user organizations want a “cheap” system that they can use to improve their business processes, thereby making a difference compared with other organizations in the same industry. But, since ERPs encourage organizations to implement standardized business processes (so-called “best practice” Wagner and Newell, (2004)), organizations get locked in by the usage of the system and then, depending on whether they are a first mover or not, they receive only a temporary CA. This implies that the ERP end-user organization often implement an ERP with the objective of having a “unique” ERP system. But does the ERP customer want a unique ERP system? If the customer believes they have a unique business model, it is likely they would want a unique ERP system. However, they also want a system with high interoperability internally, as well as one compatible with external organizations systems. It is likely that end-user
organizations have a need for a system that is not the same as their competitors. This is congruent with the ERP resellers/distributors. They receive their CA by offering their customers the knowledge of how to customize an ERP using industries’ best practices and, at the same time, how to implement functionality that makes ERP system uniquely different from their competitor’s system.

PROPOSITIONS

Proposition 1: Both resellers and end-users (encouraged by resellers) in the ERP value-chain see customization as a way of achieving CA. This results in resistance to providing software vendors with the information necessary for them to develop ERPs further in the direction of standardization, thereby decreasing the resellers’ need to customize the system.

Kalling (1999) suggested that the literature on resource protection focuses, to a large extent, on imitation, trade and substitution. He proposed that development of a resource can also be seen as a protection of the resource. Referring to Liebeskind (1996), Kalling posited that the ability to protect and retain resources arises from the fact that resources are asymmetrically distributed among competitors. The problem, according to Kalling, is how to protect more intangible resources such as knowledge. Relating this to ERPs, it follows that knowledge about a specific usage situation of an ERP would be hard to protect by legal means, such as contracts. Another way of protecting resources is, as described by Kalling, to “protect by development.” This means that an organization protects existing resources by developing resources in a way that flexibility is increased by adjusting and managing present resources. In the ERP case this could be described as customizing existing ERPs, thereby sustaining CA gained from using the ERP system. Kalling describes this as a way of increasing a time advantage. From the different ERP stakeholders’ perspectives, it could be argued that both protection by development, as well as trying to increase time advantage, influences the direction in which ERPs are developed.

Proposition 2: The conflict between different parties in the ERP value-chain and how they think they will gain CA decreases the feedback in the ERP value-chain. This tends to increase the cost for both development as well as maintenance of ERP systems.

The discussion and propositions so far suggest that decision-makers in organizations and their beliefs regarding how to gain and sustain CA by customization of ERPs, are a major hindrance to the development of future ERPs. This emanates from the assumption that organizations (end users and resellers) protect what customization they have made. The reason why they do so is based on their belief that they will sustain a CA gained by developing, selling or using customized ERPs. However, returning to Table 1 and the suggestion as to what it is that constitute CA for the different stakeholders, it can be concluded that there are some generic influencing factors. The conflicting goals of the three parties in the ERP value-chain increases complexity in the market place. From a resource-based perspective, first mover advantage could be seen as something that influences all stakeholders and their possibility to gain and to some extent sustain CA. The same could also be said about speed of implementation. The main suggestion is that even if the role of history, causal ambiguity and social complexity influences the organizations’ possibility to gain CA, the management skills that the organizations have is crucial.

When looking what improves their market share of the three different stakeholders in the ERP value-chain, it can be proposed that there are no direct conflicts amongst stakeholders. The reason is that they all have different markets and different customers; therefore they do not compete directly with one other. In reality, they have each other as customers and/or providers, as described in Figure 1. It is suggested that further development of ERPs carried out by vendors could result in a higher degree of selling directly to end-customers or other ways of delivering ERPs to end-customers so that the partners will be driven to insolvency and replaced by, for instance, application service provision (ASP) (Bryson et al. 2003) or software as a service - SaaS (Jacobs 2005). The first step in this direction would probably be signaled if the add-ons that partners currently deliver to end-customers are implemented in the core product. It can be concluded that there is a potential conflict between the different parties in the value-chain when it comes to how different stakeholders gain CA and how that influences future ERP development.

ERP software vendors become competitive if they utilize their resources to develop ERPs that are attractive to the market. ERP resellers/distributors thus need to utilize their resources to become attractive partners when implementing ERPs. Furthermore, ERP end-users need to use the ERP system so that it supports their businesses. In other words, it is how end-user organizations employ the ERP that is of importance, and it could be that having a unique ERP system (Table 1) is not as important as has previously been believed. In other words, while customization is in the interests of the resellers this may not be the case for the end users.

Millman (2004) posits that ERPs are the most expensive but least value-derived implementation of ICT support. The reason for this, according to Millman, is that a lot of ERPs functionality is either not used or is implemented in the wrong way. That it is wrongly implemented results from ERPs being customized to fit the business processes, instead of changing the process.
so that it fits the ERP (Millman 2004). However, according to Light (2005), there are more reasons for customization than just the need for achieving a functionality fit between the ERP and the organization’s business processes. He believes that from the vendors’ perspective, customizations might be seen as fuelling the development process. From an end-user’ perspective, Light describes customization as a value-added process that increases the system’s acceptability and efficiency. He further reasons that customization might occur as a form of resistance or protection against implementation of a business process that could be described as “best practices.” One reason why end-user organizations get involved in ERP development is that they want to adjust their ERPs so that it supports their core competence.

Proposition 3: End-users of ERPs and their basic assumption about how they receive CA are encouraged by resellers of ERPs. Resellers want to sustain their CA by suggesting and delivering high levels of ERP customization.

The main conclusion so far can be formulated as follows: Highly customized ERPs deliver better opportunities for CA for the resellers in the ERP value-chain while they decreases the opportunity for both ERP software vendors as well as ERP end-user organizations to attain CA.

To discuss this further, in the next section we propose various scenarios supported by some early empirical data.

SCENARIOS DESCRIBING ERP RELATED COMPETITIVE ADVANTAGE

In this section we sketch out how a newly released ERP system could be described from a CA perspective as eight possible scenarios. The description is based on initial interviews done with ERP vendors and ERP reseller consultants. Our ambition is to conduct more interviews and to use our findings to flesh out the content of table 2.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Vendor</th>
<th>Re-Seller</th>
<th>Client (end user)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Win</td>
<td>Win</td>
<td>Win</td>
</tr>
<tr>
<td>B</td>
<td>Win</td>
<td>Win</td>
<td>Lose</td>
</tr>
<tr>
<td>C</td>
<td>Win</td>
<td>Lose</td>
<td>Win</td>
</tr>
<tr>
<td>D</td>
<td>Win</td>
<td>Lose</td>
<td>Lose</td>
</tr>
<tr>
<td>E</td>
<td>Lose</td>
<td>Win</td>
<td>Win</td>
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<tr>
<td>F</td>
<td>Lose</td>
<td>Win</td>
<td>Lose</td>
</tr>
<tr>
<td>G</td>
<td>Lose</td>
<td>Lose</td>
<td>Win</td>
</tr>
<tr>
<td>H</td>
<td>Lose</td>
<td>Lose</td>
<td>Lose</td>
</tr>
</tbody>
</table>

Table 2 Scenarios describing win or lose relationship

Scenario A: It can be said that this is probably the situation that all stakeholders in a business relationship ideally want. However, to have a win-win-win situation in an ERP development value-chain is not straightforward. From the vendors’ perspective it means that they should develop an ERP system that is both so generic that the re-seller could sell it to a lot of different clients to generate licenses and at the same time it is so specific that the end users could gain a CA. However, if the vendor manages to develop such a generic form of ERP it is likely that end user would demand an extensive customization effort. The result could then be that the re-seller could sell a lot of consultancy hours for adjusting the software to the business processes in the client’s organization. This could then result in the situation described in scenario B, in which both the vendor and the re-seller have a win-win situation while the client have a negative position situation especially if they do not customize the software to the extent that they gain CA. Another reason why the situation could result in scenario B is that it is shown that if clients customize to a high extent, the long-term maintenance costs of the ERP system becomes so great that the benefits are lost. In the long run this could also result in scenario F. Scenario F describes the situation where the vendor starts to lose market share because clients have problems achieving CA resulting in a bad reputation for the ERP product. In scenario C, we see a vendor by-passing the reseller and working directly with the client enabling them both to gain a CA. Scenario D is then an interesting scenario since it is only the vendor that shows a win situation, it could be explained by the fact that if the vendor manages to develop a generic ERP system and thereby gain a more or less monopoly status they will have the possibility to sell many licenses. It could also be that the client needs to buy and implement the ERP since it more or less a necessity to implement an ERP to obtain competitive parity. Scenario E is then the situation when

2 While the data from our study is currently limited and anecdotal we will be conducting extensive empirical work with the three stakeholder groups in the future.
vendor loses and the re-seller and clients win. We see this as a possibility if the re-sellers spend so much time with clients developing ERP systems offering CA while generating large consultancy hours but at the cost of not marketing the base ERP system to new clients. Our early data gathering suggests this scenario is common among the stakeholders. With scenario G it is probably a situation that the vendor would not allow to continue. Similarly, it is difficult to believe that scenario H is sustainable in the long-run.

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