

Developing a “Better” ERP System: The Risk of Loosing Competitive Advantage

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Abstract. In this paper the resource-based view of the firm is used to describe and explain how organisations, which have different roles in the value-chain in an enterprise resource planning (ERP) system development/implementation project, receive competitive advantage from selling or using ERPs. This discussion relates to the on-going discussion about how organisations receive competitive advantage from information and communication technology (ICT), and from that and by the influence from the resource-based view a set of propositions related to ERP development and competitive advantage and what role different stakeholders play in the value-chain are presented. These propositions have the ambition of acting as a foundation for future research on development and implementation of ERPs and if and if so, how the different stakeholders’ different ways of receiving competitive advantage influence ERP development and especially when it comes to development of a more standardized or pre-customized ERP system. The propositions also act as a foundation for increasing the knowledge about reasons for why developing a future “better” ERP system is that hard.

Keywords: *Competitive advantage, Enterprise resource planning (ERP), ERP development, Resource-based view, Value Chain*

1. INTRODUCTION

The question whether if and how an organisation receives competitive advantage or not from information and communication technology (ICT) have been discussed a lot [1-3]. Another question that also have been discussed a lot is the problem with finding the “right” enterprise resource planning (ERP) or in other words finding an ERP that fits the organisation and its business processes [4-7]. The way end-user organisations have solved this problem has to a great extent been by customization of the ERP [8]. This customization can be said is in conflict with the initial idea of ERPs and what ERPs aim at. The basic idea of ERPs is that these should be standardized systems [9]. A reasonable suggestion for why ERPs customization has been done is the fact that customer so far have aimed at adopting a specific adjusted ERP that fits its specific business processes aiming at keeping or increasing its competitive advantage. It could be asked if and how the thoughts of competitive advantage have influenced this customization but also how the possibility to customize influences

competitive advantage for the different stakeholders in the value-chain for ERP development.

The paper uses the resource-based view of the firm to describe and explain how organisations, which have different roles in the value-chain in an ERP development/implementation project, receive competitive advantage from selling or using ERPs. In the value-chain for developing ERPs there are at least the following three stakeholders: ERP software vendor, ERP reseller/distributor and ERP customer. The question is how stakeholders' different base for receiving competitive advantage influences the base for developing a "better" ERP system. This relates to the on-going discussion about how organisations receive competitive advantage from ICT. In the paper a set of propositions related to ERP development and competitive advantage and what role the different stakeholder plays in the value-chain are presented. These propositions have the ambition of acting as a foundation for future research on development and implementation of ERPs and if and if so, how the different stakeholders' different ways of receiving competitive advantage influence ERP development and especially when it comes to development of a more standardized or pre-customized ERP system. The propositions also act as a foundation for increasing the knowledge about reasons for why developing a future "better" ERP system is that hard.

The rest of the paper is structured in the following way: the next section first defines ERPs and reports some findings about ERP and competitive advantage. This is followed by section three that describes the resource-based view of the firm, the VRIO framework, and gives a definition of competitive advantage. Section four describes the ERP development chain and stakeholders involved as well as what competitive advantage consists of for these stakeholders and how they receive competitive advantage. Section five then uses the resource-based view to discuss what have been presented so far. The final section then describes a set of propositions that should be seen as the conclusion from the discussion and also a direction of future research about competitive advantage and development of future ERPs.

2. ERPS AND COMPETITIVE ADVANTAGE FROM ERPS

Enterprise resource planning (ERP) systems had its introduction in the 1950s and 1960s when computers were introduced in organisations [10]. ERPs are often defined as standardized packaged software designed with the aim of integrating the entire value chain in an organisation [5, 11]. It has its origin in the manufacturing industry where the first generation of ERPs was introduced [12]. According to Kumar and van Hillebergersberg development of the first generation ERPs was an inside-out process going from standard inventory control (IC) packages, to material requirements planning (MRP), material resources planning (MRP II) and then further on expanding to a software package that aims at supporting the entire organisation (second generation ERPs). This evolved software package is then described as the next generation ERP labelled as ERP II which according to Møller is the next generation enterprise systems (ES). This development has increased the complexity both when it comes to usage as well as development of ERPs. The complexity comes from the fact

that ERPs are systems that are supposed to integrate the organisation and its business process in a one suite package. It can be stated that ERPs as well as how organisations uses ERPs have changed a lot. However, these changes have made that the interest in how to develop and sell ERPs also has changed. It can be stated that the ERP market is a market the changes a lot all the time and it also impact what stakeholders there are in an ERP value-chain but also how these different stakeholders receive competitive advantage from ERPs. So the question is if an organisation gets competitive advantage from ERP and in that case how it receives the competitive advantage.

Millman [13] states that ERPs are the most expensive but least-value-derived implementation of ICT support. The reason for this is according to Millman that a lot of functionality in the ERPs are either not used or implemented in the wrong way. That it is wrongly implemented is a result from that ERPs to often are customized to fit the business processes instead of changing the process so that it fits the ERP [13].

It can be proposed that just implementing an ERP hardly gives any competitive advantage any longer. The reason for this could be found in that the amounts of organisations that have implemented ERPs have exploded. Shehab et al., [14] claim that it more or less is in that way that the price of entry for running a business is to implement an ERP. However, what they state is that it can be a competitive disadvantage if not implementing an ERP. To further describe how different stakeholders in the value-chain of ERP development gets competitive advantage it would be interesting to theorize this using the resource-based view, which is introduced in the next section.

3. THE RESOURCE-BASED VIEW AND THE VRIO FRAMEWORK

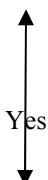
The resource-based view of the firm describes an organisation as a collection of productive resources, and have the central assumption that organisations gain competitive advantage by their internal resources [15]. The core issue in resource-based view is how to identify and exploit existing resources more effectively in the organisation [16].

The resource-based view focuses on resources and capabilities and the linkage between resources and capabilities in order to underlie persistent performance and in what way organisations differs from each other when it comes to performance. Persistent performance is described by Peteraf and Barney [15] as sustained competitive advantage. An important remark in the resource-based view is that it builds on assumptions about competitive advantage and heterogeneity of resources and if certain criteria of the resource attributes are fulfilled, the resources make it possible for organisations having control over the resources, to receive sustained competitive advantage. However, it is dependent to a high degree of organisation of resources, as shown in the value, rareness, imitability and organisation (VRIO) framework [17], which is described in Table 1.

The resource-based view suggests that a resource can provide organisations with sustained competitive advantage if different attributes for the resources are fulfilled. There is numerous resource attributes described in the resource-based view that give a

firm its competitive advantage. Barney [18, 19] as well as Cheon et al. [20] and Hedman and Kalling [16] identify the following four attributes as relevant: Valuable, rare, costly to imitate, and efficiently organized. The VRIO framework aims at identifying resources with potential for having sustained competitive advantage by answering the questions, is a resource or capability...If all answers are answered in the affirmative, the specific resource has the potential to deliver sustained competitive advantage to the organisation. However, to do that, it has to be efficient and effectively organized. Barney [19] describes this as exploiting the resource. In Barney and Wright [17] it is said that value is created by either decreasing the costs for producing the products or the services, or having the possibility of increasing the price for its products or services. This is very much in line with the basic thoughts about the value-chain as described by Porter [21].

Table 1. The VRIO Framework [19]

Is it a resource or capability...				Competitive Implications	Economic Performance
Valuable?	Rare?	Costly to Imitate?	Exploited by Organisation?		
No	---	---	No  Yes	Competitive Disadvantage	Below Normal
Yes	No	---		Competitive Parity	Normal
Yes	Yes	No		Temporary Competitive Advantage	Above Normal
Yes	Yes	Yes		Sustained Competitive Advantage	Above Normal

Rareness is defined as scarcity of resources according to Barney [19]. It is not enough with rareness for a specific resource to deliver competitive advantage. According to Peteraf and Barney [15], the cost of using that specific resource could be so high that the costs exceed the potential benefits. It could also be that the specific resource could be used in another context that provides that organisation with a higher net benefit. Important to remember when it comes to rareness is that if a specific resource is not rare, it cannot provide the organisation with sustained competitive advantage. But, it can provide the organisation with competitive disadvantage if the organisation chooses not to use that specific resource if the organisation's competitors do so. ERP usage is probably one occasion where this could happen. Web-sites for organisations could exemplify this, having a web-site does not always gives a competitive advantage but, it can do, on the other hand not having a web-site could provide the organisation with disadvantage since, more or less, all organisations have a web-site, the same could probably to some extent be said about ERPs.

If a resource is found valuable and rare, it is not evident that it provides sustainable competitive advantage, it could be temporarily. To deliver sustained competitive

advantage, the resource needs to have the attribute of being difficult to imitate. Barney [19] describes two different ways for an organisation to imitate resources. It is a little bit unclear if Barney means the imitation of usage of resources or strictly imitation of the resources as such. The two ways for imitation proposed by Barney are duplication or substitution. Duplication means strictly that the organisation uses the same "type" of resource in the same way. If the organisation will be successful depends on the cost of duplication, meaning that if cost for duplication is higher than the potential benefits from usage of that specific resource the competitive advantage will be "wiped out". The competitive advantage for the organisation that first implemented the resource will thereby sustain. The opposite is if development of the resource was more costly than duplication the competitive advantage will only be temporary. The other way of imitating a resource is by substituting the resource with another "type" of resource. This happens when it is too costly to imitate by duplication. Substituting means that a resource is used as a replacement of other resources that competing organisations use and have control over. This means that if a substitute exists and at the same time are not too costly to obtain, then the competitive advantage will only be temporary.

However, the discussion above about competitive advantage depends to a great extent on how competitive advantage is defined. A common definition of competitive advantage is that it is defined as superior financial performance on a given market, meaning that organisations that have above-normal returns also have competitive advantage. The definition Peteraf and Barney provide is as follows:

An enterprise has a competitive advantage if it is able to create more economic value than the marginal (breakeven) competitor in its product market [15].

The concept of competitive advantage also needs to be understood from the perspective of sustainability. Understanding sources of sustained competitive advantage is, according to Barney [18], a major area in strategic management research. A common approach to do this is to use the strengths, weakness, opportunities and threats (SWOT) framework. There are according to Barney two assumptions in the SWOT framework that is important to take into account when using it for analysing competitive advantage. First, it suggests that all organisations within the same area are identical when it comes to what strategic resources they have and can control as well as what strategies they practise. Second, it also suggests that if resource heterogeneity is developed, that heterogeneity would be short lived because resources are highly mobile. This differs from the resource-based view that suggests, first, that organisations within the same area can be heterogeneous regarding the resources they have control over. Second, the resource-based view assumes that resources not are perfectly mobile and therefore can heterogeneity be long lasting.

According to Porter [22], success in organisations are dependent on that new positions are created or that new values are found independent on whatever starting position the organisation has. Relating this to the resource-based view and ERP development it is of interest to look into what stakeholders there are in the value-chain and what it is that gives them competitive advantage.

4. THE ERP VALUE-CHAIN AND ITS STAKEHOLDERS

ERPs are developed in what could be described as a value-chain, consisting of different stakeholders as described in Figure 1. The value-chain can be described as the ERP business model, and it can be stated that the ERP business model at least involve three different stakeholders, who can be labelled as: ERP software vendor, ERP reseller/distributor, and ERP customer or end-user of ERP.

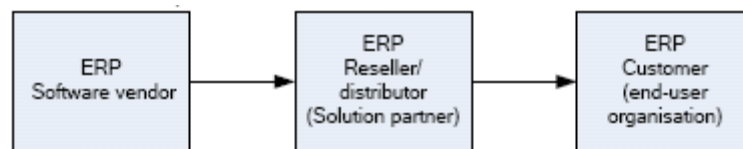


Figure 1. Stakeholders in the ERP Value-Chain

It can be stated that the stakeholders in the value-chain all further develop the ERP. 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 on the system or develop what could be labelled add-ons to the ERP core. These changes or add-ons are then implemented in order to customize the ERP to a specific customer. In some cases also the customer develops its ERP system further. At this stage of the value-chain it can be stated that the “original” ERP have changed a lot. The value-chain makes that the ERP software vendors seldom have connection to the end-user and they do not always know what functionality that are added to their specific ERP system.

Table 2. ERP Value-Chain Stakeholders and Competitive Advantage

Stakeholder	Competitive Advantage	Gained by
ERP Software Vendor	High level of market share in the ERP market (a lot of software licenses sold)	Cheap software High flexibility in the software Easiness to implement the software High possibility to customize the software
ERP Reseller/distributor	High level of market share in the consultancy market of ERP (a lot of consultancy hours delivered)	Knowledge about the customers business High competence in development of add-ons Good at customization Add-ons that are seen as attractive by customers
ERP Customer	High level of market share in the customer specific market (a lot of products or services sold)	Competitive on its market A unique ERP system that supports the ERP end-user organisation’s business processes

The question is then what the competitive advantage for the different stakeholders consist of and how they gain competitive advantage. Quinn and Hilmer [23] argue

that organisations can increase the competitive advantage by concentrating on resources which provide unique value for their customers. Table 2 describes competitive advantage and how it is gained for stakeholders in the ERP value-chain.

There are not any conflicts between stakeholders’ competitive advantage if looking at market share between the different stakeholders. The reason is that they all act in different markets and thereby do they not compete with each other, since they have different customers. However, it can be stated that further development of ERPs done by the vendors could result in that they in a higher degree sell directly to the end-customer, or that other ways of delivering ERPs to end-customers makes that the partners will be wiped out of business, and replaced by for instance, application service provision (ASP) or software as a service (SaaS). The first way to go in this direction is probably that more of the add-ons that partners deliver to the end-customer are implemented in the core product. This means that it can be concluded that there seems to be a conflict between different parties in the value-chain when it comes to how different stakeholders receive competitive advantage.

The ERP customer wants a “cheap” system that they could use so that they differ compared to other organisations in the same industry. The basic thoughts among customer organisations are that they need to have a system that not is the same as their competitor. This is then in line with what the partners want to have. The partners receive their competitive advantage by offering their customers the knowledge of how to customize an ERP using industries best practices and at the same time implement functionality that makes that their customers ERP system differs from the system competitors’ to the partners’ customer uses.

4. ERP AND COMPETITIVE ADVANTAGE SEEN FROM THE RESOURCE BASED VIEW

As Mata et al. [2] describe it, whether an organisation gains competitive advantage from software applications depend on how organisations manage these resources. The conclusion Mata et al. give is that among the attributes of software applications – capital requirements, proprietary technology, technical skills, and managerial software applications skills – it is only the managerial software applications skills that can provide sustainability of competitive advantage. Barney [18] concludes that sources of sustained competitive advantage are and must be focused on the heterogeneity and immobility of resources. This conclusion is made from the assumption that if a resource is evenly distributed across competing organisations and the resource is highly mobile, the resource does not influence sustained competitive advantage.

Whether an organisation has competitive advantage or not from ERP can to a great extent be said depends on the definition of competitive advantage. There are a lot of different definitions on competitive advantage, however, a basic definition is that the organisation gets as described above economic performance that are above normal. If this situation can be kept the competitive advantage are said being able to become sustained competitive advantage. It can be stated that there are some conflicts between attributes for gaining competitive advantage such as developing “cheap” software with high flexibility and developing a software that are easy to customize and at the same time gain competitive advantage on developing exclusive add-ons.

If the organisation is a first-mover in the sense that it is the first organisation that uses this type of resource in that specific way, it can quite easily receive competitive advantage, but, it can be temporary. How long time the competitive advantage lasts is a question of how hard it is for others to imitate the usage of that resource. This means that the question of how resources are exploited by the organisation is the main factor when it comes to if the competitive advantage becomes sustainable or not. When it comes to usage of ERPs the conclusion is that exploited by organisation could be seen as how the usage are organized, and could be seen as having effective governance and/or control over ERP usage.

The evolution of ERPs has made these resources easier to imitate, but at the moment a major hindrance in the possibility to imitate is probably the cost of implementation. This discussion can be compared to Carr's [1] statements about receiving competitive advantage by software applications.

The resource-based view says that a resource has to be rare if it should be able to provide competitive advantage. In the case of ERPs it can be said that this kind of resources are not rare. There are a lot of different possibilities for organisations to implement ERPs and the evolution of ICT has made it more feasible for more organisations to implement ERPs, by decreasing the costs for usage of ERPs. However, as described by Barney [19] as well as by Shehab et al., [14] not implementing an ERP can give an organisation competitive disadvantages.

6. CONCLUDING PROPOSITIONS

ERP solution partners often develop add-ons which have a specific functionality solving a specific problem for their customer. This can be seen as customization, where solution partners use their knowledge about the customers industry in addition to their knowledge about the specific customer. This is one way for a solution partner to have or increase their competitive advantage and earning more money. Another way is that the solution partner sells the add-on to other partners. This could result in that the solution partner decreases its competitive advantage in the long run, but, most probably solution partners do not see this as a risk of decreasing their competitive advantage. The reason is most probably that the selling solution partners see it as that will not influence their possibility to have competitive advantage since the solution partner they sell to sells the add-on to customers already using the same ERP system and this will not make end-user change solution partner. It could be asked if then the same could apply for if the solution partner sells the add-on to the software vendor. The answer to that question depends on the incentives the solution partners have for doing that. The risk of selling the add-on to the software vendor is that it thereby will directly influence the customer base the solution partners have. If the add-on is implemented in the basic software both the possibility to sell the add-on to end-customers as well as to other solution partners will disappear. Competitive advantage of ERPs is probably wiped out by duplication as well as by substitution. If for instance the ERP reseller sells their add-on to the ERP software vendor the duplication of that add-on will be quicker and the competitive advantage that the ERP reseller had on being the one that delivered this add-on will be wiped out. However, if

they keep the add-on as “their” solution other ERP reseller or the ERP software vendor will probably substitute the add-on. One way for the reseller to earn some money on the add-on could be to sell it to other resellers, and if they do so they probably builds up a market for the add-on that they be competitive in.

The discussion in the paper can be concluded in the following propositions:

Proposition 1: Since both partners as well as end-users in the ERP value-chain see customization as a way of having competitive advantage they both have resistant of providing software vendors with the information necessary for them to develop the future ERP that could be so standardized that it does not have to be customized.

This conflict of interest can probably also result in:

Proposition 2: The conflict between different parties in the ERP value-chain and how they think they receive competitive advantage makes that the cost for both development as well as maintenance of ERP is higher than it otherwise had to be.

The reason for why this is the case can be described as:

Proposition 3: End-users of ERPs and their basic thoughts about how they receive competitive advantage are supported by the delivering partners of ERPs and that partners want to sustain their competitive advantage by delivering and suggesting high grade of ERP customization.

This can also be described as:

Proposition 4: The end-user wants to make sure that they can compete and the thoughts they have of being able to do so is by having an ERP that differs from their competitors.

And this results in that:

Proposition 5: The ERP software vendor need to be extremely careful when developing a system that have functionality that the partners deliver since it otherwise could be that the partners chooses another ERP in their portfolio.

From this the main conclusion can be formulated as:

Proposition 6: A highly customized ERP delivers better opportunity for competitive advantage for the delivering partner in the ERP value-chain while it makes the opportunity for both ERP software vendors as well as end-users to receive competitive advantage worse.

The discussion and the propositions suggest that decision-makers in organisations and their thoughts about how gain and sustain competitive advantage by a customized ERP is a major hindrance for development of future ERPs. This conclusion is made from the assumption that organisations protect what they have customized as well as why they have customized their ERPs, based on the thinking that they thereby will sustain the competitive advantage gained by their customized ERP.

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