

## E-BUSINESS AS A SOURCE OF COMPETITIVE ADVANTAGE

Vaida Pilinkiene<sup>1</sup>, Ralph-Jörn Kurschus<sup>2</sup>, Goda Auskalnyte<sup>3</sup>

<sup>1</sup>*Kaunas University of Technology, Lithuania*

<sup>2</sup>*Kurschus, Lawyers and Managers of Bankruptcies, Germany*

<sup>3</sup>*JSC Project Consultation and Research, Lithuania*

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### Abstract

*The article presents the analysis of the relationship between e-business benefits and competitive advantage. Different approaches of authors towards e-business and competitive advantages have been analyzed and summed up, the analysis of the e-business impact on usual business processes has been outlined, resource-based as well as M. Porter's approaches to competitive advantage were compared. The model relating positive impact of e-business on nine different business processes and competitive advantage was developed. The model may be integrated into broader research framework constructed for the analysis of e-business development and its role in gaining competitive advantage in any industry. Although many studies confirmed that e-business solutions have a positive impact on various business processes e-business benefits do not necessarily lead to the increased profits and/or sales, thus the association of e-business value with the competitive advantage should be made with caution.*

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**Keywords:** *e-business, competitive advantage, resource-based approach.*

**JEL Classification:** *M21, L20.*

### 1. Introduction

**Problem.** E-business is understood as the processes and tools that allow companies to use internet-based information technologies to conduct business internally and externally. Lately company's investments into e-business infrastructure and e-business solutions have been considered to be of primary importance for the companies seeking to compete successfully in any industry and market. As Rodgers *et al.* (2002) argued, companies attempting to be competitive can barely manage without e-business. Though e-business is considered to be very important and beneficial for companies, there is growing concern about the payoff of the investments into e-business. As Soto-Acosta *et al.* (2008) states, "in recent years, scepticism about the value of e-business and information technology (IT) at the level of an individual firm has been renewed" (p.49). These growing concerns mainly stem from the fact that the materialization of e-business impact on the improved financial performance of the company is not obvious.

**Background.** Various studies (Craig, 2000; Christensen & Methlie, 2003; Zhu, 2004; Dadzie *et al.*, 2005; Soto-Acosta & Meroño-Cerdan, 2008; Jensen, 2008), seeking to examine the e-business's impact on the usual business processes, claimed that e-business improves business processes through the automation and optimisation of usual business processes. The main benefits associated with e-business solutions are increased efficiency and effectiveness of various business processes, improved internal and external communication, reduced costs and the like (Porter, 1998; Oliver, 1997; Christensen & Methlie, 2003; Chong, 2010). Those benefits in the academic literature (Akkermans, 2001; Mooney, 2007; Newbert, 2007; Sila, 2012) are often related to the competitive advantage of the company, which suggests that company competes successfully. However the meaning of competitive advantage is too often used as self-evident. Although the benefits created by e-business solutions are being related to competitive advantage, there is lack of empirical studies analyzing the relationship between e-business benefits and competitive advantage.

Thus, *the purpose of the article* is to find out the relationship between e-business benefits and the competitive advantage. The scientific research methods applied in the article, include systemic, comparative and logical analysis.

## 2. The Impact of e-business on the Usual Business Processes

E-business is based on information technologies, which as a research topic had been analysed since 1980's. With the spread of internet usage, e-business has gained huge attention in the academic literature. However the definition and understanding of e-business is not fully developed and means different thing to different researchers. E-business is very often understood just as the financial and commercial transactions online (Aston and Schwarz, 1992, Cronin, 1994), thus using the definition of e-business interchangeably with e-commerce concept. The broader definition of e-business term covers all business processes which also include e-commerce (e.g. Craig, 2000; Graaf & Muurling, 2003). The second approach to e-business has been applied in this research and in order to make the definition fully clear, the definition was adopted from e-Business w@tch<sup>1</sup>, which defines e-business as an “automate business processes (both intra-and inter-firm) over computer mediated networks“. Similar definition of e-business has been developed by the Government of the Republic of Lithuania in the document “Lithuanian e-business concept”, accepted in 2001, which also takes business processes oriented view to e-business.

Literature on e-business impact focuses on the application of various e-business solutions and their impact on the business processes. Drawing on various studies, key application areas of e-business solutions may be inward oriented (internal business processes) and outward oriented (to the external environment oriented business processes). Concrete outward oriented application areas of e-business are value system integration achieved by closer cooperation between different players in the industry, customer-oriented activities and supply chain integration. Main e-business solutions for the described application areas are e-procurement solutions, e-commerce, order management systems, Customer relationship management (CRM), e-invoicing and the like. Key inward e-business application area is management of internal work processes with the help of such e-business solutions as Enterprise resource planning (ERP), Knowledge management system, Enterprise document management system (EDM), e-learning applications and the like.

A substantial set of literature on e-business focuses on the various aspects of the improvement of business processes through the application of e-business solutions in those processes. Croom (2000) used Delphi method to find out the impact of Web-based order processing system for the procurement of management, repair and operation items. The study was exploratory in nature was directed to the exploration of the opportunities and benefits of web-based procurement application. Study result showed that web-based procurement lead to reduction of administration costs, improved expenditure control.

Further, Soto-Acosta and Meroño-Cerdan (2008) attempted to identify e-business resources and capabilities and to find out the relationship between those two separate variables and firm's performance. 1010 randomly selected companies in the territory of Spain participated in the study. Data in the research was analyzed and hypotheses tested using structural equation modelling. The result showed that IT resources (in this study understood as e-business infrastructure) was not related with e-business value (measured as the impact on procurement). However e-business capabilities (actually measured as e-business solutions) had a positive impact on procurement (procurement costs, cost of logistics and inventory and relation to suppliers).

Dadzie *et al.* (2005) using survey methodology analyzed customer service in the internet-enabled supply chain and claimed that loyalty may be achieved through personalization of the customer service more than through operations improvement. Barnes *et al.* (2003) using cross-comparison analysis categorizes motivations for e-business applications through the prism of perceived efficiency and effectiveness. Case study methodology was used in the research. The main

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<sup>1</sup> The e-business market watch is initiative of the European Commission set up to study the usage and impact of e-business in enterprises from different sectors.

research instrument was in-depth interviews with the representatives from seven companies operating in manufacturing and financial service sectors. Sanders (2007) analyzed the benefits of e-business technologies from the supplier perspective. 241 suppliers in the computer industry were involved in the study. Study results showed the association of e-business with strategic and operational benefits.

The generic value chain model proposed by Porter (1998) is most suitable for manufacturing companies. Using value chain model, various activities of the company are divided into primary and supportive activities. According to Porter (1998), the primary activities are directly related with the value of the manufactured goods and encompass inbound logistics, operations, outbound logistics, marketing/sales and services. Those primary activities are supported by supportive activities, which may support one primary activity and entire value chain. Supportive activities are important for smooth operation of the company and cover such activities as firm infrastructure, human resource management, technology development and procurement (Porter, 1998).

Regarding the primary activities such as inbound and outbound logistic, e-business solutions enable companies to atomize processes and effectively monitor and control inventory, which improves planning and the effectiveness of those processes. Atomization of the processes enables to save time and thus increase effectiveness. In another primary activity – operations, applied e-business solutions improves flexibility and the production of goods, which meet demand more accurately. Marketing and sales through e-business solutions provides new marketing and sales channels, enables to receive clearer picture of the market. In the primary activity such as service, e-business enables enterprises to spread information to their clients much faster. Further, for the procurement processes e-business may be beneficial by enabling companies to minimize the number of transactions and reaching the suppliers much faster. In the area of human resources management, e-business through e-learning enables companies to develop new capabilities faster. To sum up, e-business value may be created by e-business application through several broad areas: knowledge management, information management, atomization, coordination and faster processes. By applying e-business into usual business processes, companies may improve various business processes by shorter shipping time, faster response to demand, much faster exchange of information in the whole value system, which is very important because the communication between the suppliers or manufacturers abroad might be very complicated and very time-consuming process.

In answering the question whether its worth to invest in e-business solutions and other e-business activities or not, many scepticism arises from studies, which find no relationship between IT investments and firm's financial performance (e.g. Strassmann (1997), Salmela (1997)). This scepticism in the literature is very often related with the "IT productivity paradox" described by Brynjolffson (1993). As it was already mentioned, though IT value is discussed widely, there is quite few studies on the evaluation of e-business impact on firm's financial performance. One of the first attempts to evaluate e-business impact on firm's performance was made by Zhu and Kraemer (2002), who expanded the literature about IT impact on the companies by introducing into the analysis internet and e-commerce. The authors tested the interaction between e-business capabilities and IT intensity and the associations of the interaction between those variables with the improved supply chain efficiency, profitability and lower cost measures. Data on 260 manufacturing companies was collected and analyzed. Results showed that there was not significant relationship between e-commerce capability and supply chain efficiency. However, the research results showed the significant relationship between e-business capabilities and inventory turnover.

Further, Christensen and Methlie (2003) conducted a survey in Norwegian enterprises seeking to find out if e-business had a significant positive impact on sales, profits, return on investments and return on equity. 330 companies actively engaging in e-business participated in the survey. Survey results were analyzed using descriptive statistics, cross tabulations and exploratory factor analysis. The results showed that 21,4 % of companies reported increase in sales, 14,8 % reported increase in profits, 13,1 % - return on investment, 10,8 % - return on equity. Based on the results, authors argued that usage of e-business in most cases had no significant impact on firm's financial and economic indicators. The study also revealed that e-business in Norwegian enterprises is in its

infancy and that the companies “put all their efforts into relatively simple and primitive e-business solutions” (Christensen & Methlie, 2003, p. 27). Based on the findings authors stressed the role of management in the development and implementation of appropriate e-business model in order to create competitive advantage.

In the study on the interaction of e-commerce and IT on firm performance, Zhu (2004) found the positive relationship between e-business capabilities and company’s improved financial performance. Zhu (2004) replicated in previous study developed conceptual framework relating two set of variables – e-commerce capabilities and IT infrastructure with firm performance. Several specific hypotheses were related with the exploration of the relationship between e-commerce and performance, i.e. “sales generation, cost reduction, asset return and inventory turnover” (Zhu, 2004, p. 178). Results showed that e-commerce capabilities in combination with IT infrastructure significantly correlated with improved performance measures of the firm. Based on the findings, the author provided the explanation of “IT productivity paradox” stating that “ignoring the complementarity in business value measurement implies that the impact of IT was seriously underestimated” (Zhu, 2004, p. 167).

Sanders (2007) used confirmatory factor analysis to analyze the association of e-business with the strategic and operational benefits from the supplier perspective. The target population of the research was 1000 U.S. companies. Operational benefits in this research was the construct of three variables- cost efficiencies from higher sales volumes, improvement to current processes, increased profitability. A strategic benefit was constructed from three variables as well – learning about customers and markets, creation of new products and product enhancement and development of business opportunities. The results demonstrated that the integration of buyer-supplier achieved through e-business had both strategic and operational benefits for the supplier companies. Based on the findings, Sanders (2007) claimed that supplier companies gain when using various e-business technologies.

Based on the literature review it may be concluded that integration of e-business solutions in the usual business processes may improve all activities throughout the value chain however e-business impact on the improvement of firm’s financial performance of the company is debatable. In many studies when analyzing e-business impact on business process from the benefits perspective, the benefits created by e-business are very often associated with the value creation and competitive advantage of the firm. Relating the benefits created by e-business with the competitive advantage in a way suggest that investments in e-business solutions may generate better performance and thus lead to better financial performance. However, there is also lack of empirical studies analyzing whether positive e-business impact (benefits) really lead to the competitive advantage, what is usually claimed in various studies.

### **3. Competitive advantage: theoretical approach**

The concept of competitive advantage is used very often in economic literature without clear definition what does the author mean by applying this concept in his or her research thus leading to the situation that the meaning of competitive advantage is “taken for granted but not fully understood” (Mooney, 2007). Though there isn’t one clear definition of competitive advantage, the creation of value is the milestone of any definition of the concept. Given the different theoretical approaches to the value creation the approach to competitive advantage may be segmented into two dominant approaches – resource based view approach to competitive advantage and approach to competitive advantage developed by M. Porter. In an effort to develop appropriate conceptualisation of competitive advantage, previous studies on the subject are reviewed in the following sub-parts.

**Resource-based approach to competitive advantage.** The beginning of the theory of competitive advantage is related with the industry focused approach, developed in 1960’s which rested on the logic that competitiveness of the company in the market depends on the structure of external environment and on the company’s action by which company attempts to adapt to the

environment. The main weakness of industry focused approach to competitive advantage was its limitation to explain diversity because all companies operating in the same industry based on its logic were forced to choose the same strategy in order to be competitive.

Contrary to the industry focused approach to competitive advantage, models developed by the approach known as resource based view became established and accepted approach to competitive advantage in the academic literature. Studies grounded on resource based view focus on the firm's internal resources and capabilities, which are analysed with the references to firm's external environment. The possession of specific resources, which are the main source of competitive advantage, and the issue of the successful deployment of those resources are the cornerstones of the resource based view. Resource based view of the firm were thoroughly represented by scholars Day and Wensley (1988), Barney (1991), Oliver (1997), Aaker (1989) and others.

One of the most important concerns of the various resource based view studies are to identify what resources and capabilities are necessary to create competitive advantage in the company. Some of the resource based view scholars concentrated their attention on the definition of the resources, which are necessary to create competitive advantage (Barney (1991); Amit & Schoemaker (1993); Collis & Montgomery (1995)). Other authors focused their attention on the capabilities and certain competences, which are necessary for the successful exploitation of the possessed resources (Mahoney & Pandain, 1992). Further the combination of resources which are important in creating competitive advantage and the capabilities, which are necessary to exploit the important resources were discussed in the academic literature (Lippman & Rimmelt (2003)).

Barney (1991) was among the first scholars to formalise resource based view into theoretical framework (Newbert, 2007). Barney (1991) argued that resource has to be valuable, rare, imperfectly imitable and not substitutable to enable the creation of competitive advantage, which is expressed as an improved performance of the company. Contrary to Barney (1991), Grant (1991) attributed following characteristics to the resources as the most important - durability, low-transferability, low-replicability and low transparency. Further study by Amit and Schoemaker (1993) summarised previous research on the characteristics of the resources and developed eight desired characteristics of the company's resources and capabilities, which are responsible for creating economic rent – “durability, appropriability, limited substitutability, inimitability, low trade ability, scarcity, complementarity and overlap with strategic industry factors” (p. 38). Similarly to the previous studies on the resources, Collis and Montgomery (1995) proposed such characteristics of resources as inimitability, durability, appropriability, non-substitutability and competitive superiority to be the most important in creating value, understood as financial returns and performance.

Studies of Lippman and Rimmelt (2003), emphasised the importance of combining company's resources and capabilities in creating competitive advantage. Authors related competitive advantage with the economic and simple rents and argued that the only source of it is the possession of valuable resources.

As follows from the literature review on the resource-based view, e-business solutions could be analyzed as a resource of the company, which influences company's activities and has a potential to create competitive advantage which leads to successful financial performance due to the involvement into e-business. However, despite the fact that the resource based view to competitive advantage is widely accepted in the academic literature, several weaknesses of this approach may be identified:

- The resource based view approach to competitive advantage doesn't provide clear explanation and empirical evidence which resources and what combination of resources creates competitive advantage;
- Difficult to apply the approach to the real strategy, because too much emphasis in the literature is focused on the definition of resources;
- The resource based view could be also criticized for circular reasoning, because resources may lead to competitive advantage, but this in turn defines relevant competitive structures, which in turn defines what a valuable resource is and so on.

**M. Porter's approach to competitive advantage.** Another important approach to competitive advantage is the one, developed by Porter (1980, 1998), who stressed the importance of industry structure and the firm's activities (as opposed to resources). In the early stage of the development of his approach to competitive advantage, Porter (1980) developed industry-focused perspective to competitive advantage which in the later stage was modified and combined with the firm-focused perspective.

Back in 1980's M. Porter suggested that competitive advantage may be regarded as the function of the industry attractiveness and company's competitive position in the market (Porter, 1980). According to Porter (1980), company's position in the market has influence on competitors, which changes the industry structure and vice versa. After competitor's reaction, changed industry structure may force company to change its actions and the strategy. Porter (1980) identified five forces, which form firm's competitive advantage in the industry: threat of new entrants, threat of substitutes, bargaining power of suppliers, bargaining power of buyers and competition between competitors.

Later on, Porter (1998) argued that "competitive advantage cannot be understood by looking at the firm as a whole. It stems from the many discrete activities a firm performs in designing, producing, marketing, delivering, and supporting its product" (p. 33). That's why he introduced the value chain model, discussed earlier, which is important when analyzing the sources of competitive advantage. Though Porter didn't provide the clear definition of competitive advantage, he noted that: "Competitive advantage is at the heart of a firm's performance in competitive markets"(p. xxi, Porter, 1998). He identified two types of competitive advantage – cost advantage and differentiation. Porter (1998) also proposed three generic strategies "for achieving above-average performance in the industry: cost leadership, differentiation and focus "(p. 11).

Both types of competitive advantage Porter related with the ability to create superior performance and suggested that "the difference between value, that is, what buyers are willing to pay for a product or service, and the cost of performing activities involved in creating it, determines profit" (Porter, 1998, xvi). Thus Porter's approach to competitive advantage is directly related to the firm's profit and by this logic, increase in profits could be understood as the firm's success in gaining competitive advantage.

#### **4. Conceptualization of e-business benefits and competitive advantage**

As the literature review suggests, e-business may be understood as one of the IT-dependent strategic choices to create value and competitive advantage. However, more developed research field is in evaluating the IT impact on competitive advantage rather than e-business impact on competitive advantage. Approach to e-business as a value creation source in the company have been analyzed by Akkermans (2001), Christensen and Methlie (2003), Barnes *et al.* (2003) and other authors who related the benefits of e-business with value creation. However there are not clear evidence that the benefits created by e-business really lead to competitive advantage, which following the resource-based view and Porter's approach to competitive advantage is related to firm's financial performance.

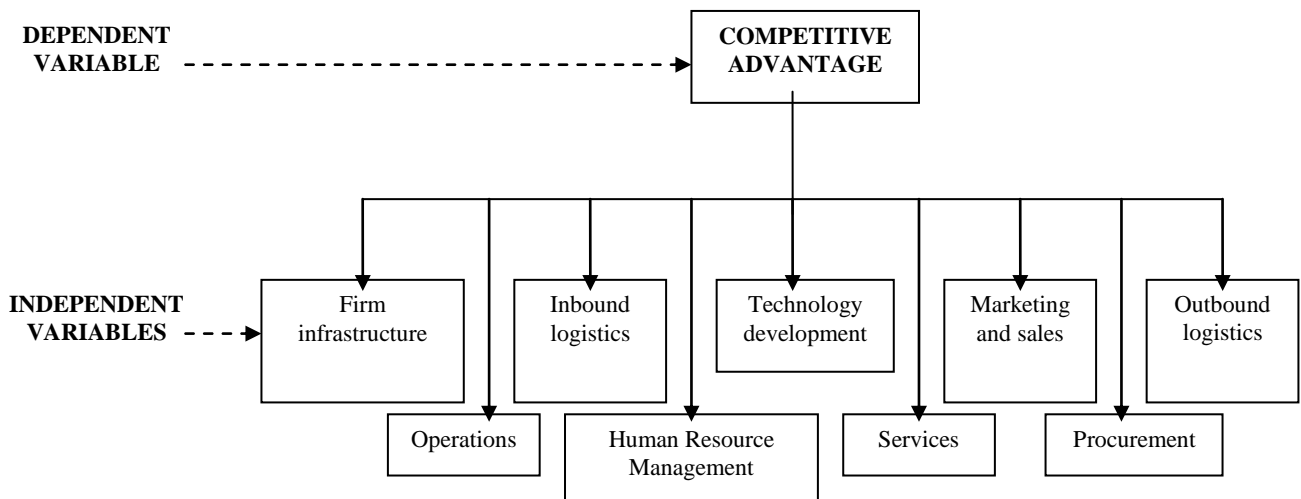
Drawing on the literature review, e- business benefits in this research is understood as the positive impact of e-business solutions on various business processes or in other words – the improvement of these processes. The processes on which e-business impact was measured were identified using value chain model, which divides business processes into four supportive activities (i.e. firm's infrastructure, human resource management, technology development, procurement) and five primary activities (i.e. inbound logistics, operations, outbound logistics, marketing/sales and service) (Porter, 1998). Thus the improvement of value chain activities was the main indicator of e-business benefits. Based on this, variable representing e-business benefits was divided into nine independent variables representing the e-business impact on each process of the value chain.

The benefits induced by e-business solutions are often associated with the competitive advantage in various studies, but the concept of competitive advantage is usually applied as a self-evident. Though the approaches of competitive advantage doesn't provide with the clear definition

of the concept, they are useful in developing the indicators for the competitive advantage. Based on the literature review on competitive advantage, the term is interchangeably related with the company's financial performance, however the financial indicators differs across various studies. It's known that the ultimate goal of any company is to generate profits, by which the success of company is usually measured. Thus, following this logic, profitably working company in any industry has a competitive advantage, which defines company's good performance.

The critique of linking competitive advantage with the performance was expressed in the work of Hao (1999), who criticised previous studies on competitive advantage; especially the resource based view approach, for the interchangeable use of competitive advantage concept and improved financial performance of the company. He argues that competitive advantage is relational term and defines it as a "comparison drawn between a focal firm and its rival(s) on certain dimension(s) of concern in competition" (Hao, 1999). Drawing on Hao's perspective, the analysis of competitive advantage is possible only when comparing different companies on the certain dimension, which might be different in each case. Seeking to find out whether one company has a competitive advantage over the other there is necessary to define the reference point or put in other words, to answer the questions on what several rivals are being compared. Though it seems promising conceptualisation of the term, it raises the problem when there is a need to identify competitive advantage upon one dimension in a big sample. Hao's approach to competitive advantage differs from the developed approach to competitive advantage in a sense that it is a relative position oriented and not the result oriented (e.g. improvement of the financial results due to the possession of certain resource). However, the relative better position or resource possessed by one company is also an important stimulus for the improvement of financial results. Thus, the logic of linking certain resources with the improved financial performance and claiming that certain resource is important in gaining competitive advantage seems to be appropriate when analysing whole industry.

In this research following the studies on competitive advantage, competitive advantage was measured by the increase in profit and/or sales due to e-business applications. The model linking e-business benefits with the competitive advantage is presented in *Figure 1*.



**Figure 1.** The model linking e-business benefits with the competitive advantage

The increase in sales due to the usage of e-business solutions was included in the measurement of competitive advantage with the assumption that the assessment of profitability takes more time than the assessment of increase in sales, which is also important indicator of improved firm's position in the market, which is an important aspect of competitive advantage. Thus the two indicators for competitive advantage used in this research were increase in profits and increase in sales.

## 5. Discussion

E-business solutions such as supply chain management, resource planning system, e-commerce and others create diverse benefits for the business. Although the integration of e-business solutions in the usual business processes may improve all activities throughout the value chain, e-business impact on the improvement of firm's financial performance of the company is debatable. Most of the studies analysing e-business impact on the usual business processes emphasize e-business benefits understood as the improvement of those processes and relate them with the competitive advantage. Put in other word, studies on the e-business benefits regard e-business solutions as an important source of competitive advantage; however, the empirical research exploring the relationship between e-business benefits and competitive advantage is limited.

E-business benefits based on the literature review were conceptualised the positive impact of e-business on different business processes. The competitive advantage was conceptualised as the increase in profits and/or sales due to e-business solutions. The model relating positive impact of e-business on nine different business processes and competitive advantage was developed. Although many studies confirmed that e-business solutions have a positive impact on various business processes e-business benefits doesn't necessarily lead to the increased profits and/or sales, thus the association of e-business value with the competitive advantage should be made with caution.

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