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Value Creation in eBusiness: Exploring the Impacts of Internet-Enabled Business Conduct

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Abstract

This research seeks to explore value creation through e-business by emphasizing the impacts of Internet-enabled business conduct. We assume that firms may reap the benefits of engaging in e-business only if they are able to develop, adopt and use Internet-enabled business models (e-business models). Moreover, e-business value is created only if firms adopt e-business models that respond to relevant value drivers. Value drivers are certain key aspects of the business model that play a key role and possess the power of directly influencing e-business value creation. In this study, several economic and financial performance measures were used as value indicators. A survey was conducted in Norwegian enterprises. This research confirms that e-business is in its infancy. Moreover, in addition to a fairly limited e-business experience, the participating enterprises seem to have put all their efforts into relatively simple and primitive e-business solutions. Hence, the power of the Internet is wasted on solutions that basically support the automation of existing and traditional business processes. For a vast majority of the enterprises participating in this study, there have been no significant changes in key economic and financial indicators since they took up e-business. However, our research demonstrates that there is an association between value creation and e-business conduct. E-business value creation is associated with relevant e-business value drivers, namely efficiency, complementarities, customer retention, and innovation.

1. Introduction

Electronic business (e-business) is a major force in the global economy. Businesses and consumers alike increasingly engage in e-business, particularly Internet commerce which entails selling and buying of goods and services over the Internet.

Today, e-commerce in and between enterprises (B2B) accounts for more than 80% of the e-business volume. It is expected that B2B e-commerce will continue to increase faster

than B2C e-commerce. Forrester Research holds that B2B e-commerce within the EU will increase from one percent of the total trade volume in 2001 to 22% in 2006.

Potentially, future developments in e-commerce and e-business will have some significant and major implications for value creation in enterprises. There is a need for research to describe and explain the economic impacts of these changes for managers and policy makers. The research reported here seeks to address some of these needs. Specifically, our research objectives are to explore key characteristics of e-business conduct, and examine the value impacts thereof. We hypothesize that firm performance, and thus value creation, to a large extent is determined by the structure and relevance, i.e., the appropriateness, of the business models employed by enterprises. More specifically, we assume that firms may reap the potential benefits of engaging in e-business only if they are able to develop, adopt and use appropriate Internet-enabled business models. We will refer to such Internet-enabled business models as *e-business models*.

2. Theoretical Foundation

The use of the Internet as a technological platform in business enterprises is fostering changes in business models. The Internet has considerably changed the costs of gathering information, as well as controlling and coordinating market transactions. Electronic market places, electronically connecting buyers and sellers through a central database, reduce transaction costs for both buyers and sellers. Transactions are transferred from internally coordinated activities to market exchanges (Malone *et al.*, 1987). Value chains are disintegrated by outsourcing activities (Evans and Wurster, 1997), and distribution channels disintermediate by eliminating intermediaries or reintermediate by existing intermediaries migrating to the electronic market places as market makers (Amit and Zott, 2001). To understand value creation in this business environment, a theoretical foundation building on several perspectives is called for. We build our conceptual research framework of e-business value creation on three theoretical perspectives. Similar multi-perspective views are offered by Child and Faulkner (1998) on networks in general, and by Amit and Zott (2001) on e-business value creation in particular.

Cost reduction is the major source of value creation in *transaction cost economics (TCE)*. TCE focuses on minimizing costs for the two parties involved in a commercial relationship. Cost reductions are achieved by lower search costs, less asymmetric information between suppliers and buyers, scale economies of production, etc. Moreover, reputation, trust, and transactional experience can lower the costs of idiosyncratic exchanges between firms (Williamson, 1985). Transacting over the Internet may have significant effects on transaction costs. Direct costs, such as search costs, and indirect costs, such as the costs of adverse selection, will decrease as a result of an increasing frequency of transactions (due to open standards), a reduction in uncertainty (by providing more transaction-specific information), and a reduction in asset specificity (lower site specificity) (e.g., Amit and Zott, 2001).

TCE describes the firm in organizational terms as a governance structure where firm (hierarchy) and market are the two extreme modes. In e-business, however, we can observe new business models such as affiliate and associate programs, and syndication models (Werbach, 2000). Few of these models seem to be based on TCE. Rather, they are more easily explained by resource sharing objectives, where a firm maximizes its value by getting access to other firms' valuable resources. *The resource-based view of the firm (RBV)* explicitly looks at resources and capabilities as the principal basis for competitive advantage (Grant, 1998). While TCE emphasizes cost minimization in dyadic inter-firm

relationships, RBV emphasizes value maximization through pooling of valuable resources.

RBV views the firm as a bundle of resources and capabilities. Firms that are able to accumulate resources and capabilities that are rare, valuable, non-substitutable, and difficult to imitate, will achieve a competitive advantage over competing firms (Barney, 1991). Hence, RBV postulates that the services rendered by a firm's unique bundle of resources and capabilities, may lead to value creation (Amit and Zott, 2001). A firm's resources and capabilities are valuable if, and only if, they reduce costs or increase revenues compared to what would have been the case if the firm did not possess those resources (Barney, 1997).

The resource-based view can be extended to deal with inter-firm network relationships, especially resource complementarities. Das and Teng (2000) have developed a resource-based theory of strategic alliances in which they suggest that the rationale for alliances is the value creation potential of firm resources that are pooled together. They note that certain resource characteristics, such as imperfect mobility, imitability, and sustainability, promise accentuated value creation, and thus facilitate alliance formation.

However, as the importance of information-based resources and capabilities increase within e-business firms, accessing such resources through partnering and resource sharing agreements is more viable (Amit and Zott, 2001). These resource sharing organizational forms are commonly denoted *strategic networks*. Strategic networks are "...stable inter-organizational ties, which are strategically important to participating firms. They may take the form of strategic alliances, joint ventures, long-term buyer-seller partnerships, and other ties" (Gulati *et al.*, 2000:203). Networks have been studied from several perspectives. Sociologists have focused on network structures in terms of density and centrality (Freeman, 1979); strategic management has been concerned with trust (Lorenzoni and Lipparini, 1999) as well as resources and capabilities (Gulati, 1999); and economists have studied network effects such as indirect network externalities (Gupta *et al.*, 1999) and direct externalities (Shapiro and Varian, 1999).

Network effects and complementarities have been found to be important in the context of value creation through e-business (Shapiro and Varian, 1999). The strategic network perspective has been fostered by the economics of information of electronic networks where the cost of gathering information, controlling, and coordinating transactions with other economic actors, has been significantly reduced (Malone *et al.*, 1987). Networks emerge from disintegrated value chains (Evans and Wurster, 1997). In recent years, the concept of *value networks* has gradually replaced that of value chains to describe value creating systems. Sequential relationships connecting value-adding activities along a linear value chain are always present. However, these relationships have to span activities across firms and industries to encompass the whole value creating system of the final product or service, i.e., all activities that collectively are engaged in providing the ultimate customer value (Parolini, 1999).

Complementarities are present whenever having a bundle of goods together provides more value than the total value of having each of the goods separately (Amit and Zott, 2001:504). Complementarities define the horizontal scope of a provider, and change the value creating system from a linear value chain focusing on profit maximization within a firm to a network of interrelationships that focuses on maximizing the ultimate customer value, as well as a mechanism for sharing the generated revenues among the participant of the network. Complementarities have an exponential effect on the demand. Thus, demand increase is a function of the number of complimentary components of the product or service. This supply side effect on demand is called indirect or market-mediated *network externalities* (Gupta *et al.*, 1999). Complementarities also occur vertically - upstream or downstream.

E-business firms leverage the potential for value creation by offering bundles of complementary products and services to their customers in the new electronic market places. They are often related to the core transaction enabled by the firm. Due to open, standardized platforms, it is technically easy to link activities and integrate services across value chains on a web site.

3. Conceptual Research Framework

While there is a rich body of research on the relationship between firm performance and ICT investments in general, there is little evidence that Internet-based e-business practices have had significant bottom line impacts on firms.

The performance and ultimate success of business firms are normally expressed in terms of financial measures such as profits, cash flow, economic value added (EVA), market valuation, earnings per share, sales, return on investments, etc. Obviously, value creation is closely related to the concept of business performance. We should, however, not forget the customers. A study of value creation through e-business should recognize that the total value created is the sum of the value accrued to end customers and the value accrued to all the actors (mostly enterprises) taking part in the value creation process throughout the value system.

A limitation of the present study is that we have left out the end customer by not collecting data on value creation as perceived by customers. Hence, our empirical data are incomplete and insufficient and do not allow us to draw *overall* conclusions as far as value creation through e-business is concerned. In our study, we focus on changes in businesses' financial performance. Thus, we are able to draw some conclusions about how business value creation is affected by e-business efforts. We shall refer to this as *e-business value*.

E-business value is to a large extent determined by the specific *e-business model* employed by the enterprise. Specifically, we think that certain key aspects of the business model will play a key role and possess the power of influencing e-business value directly and significantly. We shall refer to those aspects as *e-value drivers*.

Business Value

In this study, e-business value refers to the value accrued to the economic players of the value system, i.e., mostly business firms. Hence, we constrain our measurements of value creation through e-business to changes in the economic and financial indicators of enterprises. This is consistent with the approach taken by Barua *et al.* (2001). They developed a model of business value for Internet enabled business transformation. The model suggests that Internet enabled business performance is judged by traditional *financial performance measures* such as revenue per employee, gross profit margin, return on investments, etc. Furthermore, the model posits that improved financial performance is a result of *operational excellence* in business conduct.

Business Models

The concept of a *business model* has been broadly defined as the way of doing business (Ovans, 2000). Others more explicitly relate the business model concept to the value creating system. A business model is a description of all the activities or key business processes, and the flows of products, services, and information associated with these processes. Also, it describes all the actors participating in the business venture, including the roles and relationships as well as transactions completed between those actors – with or without the associated revenue models (e.g., Timmers, 1999; Weill and Vitale, 2001).

Some experts are more explicit about economic and financial aspects. While Kim and Marbourgne (2000) define a business model as the firm's price and revenue model, Elliot (2002) holds that a business model specifies the relationships between different participants in a commercial venture, the benefits and costs to each and the flows of revenue.

The success of a firm's business model derives from a fit not only between the firm and its customers, but also the fit between the firm and its collaborating partners. The fit is all about defining the firm's boundaries horizontally and vertically, deciding on collaboration governance, and determining the commercial relationships between the partners of the network (Methlie and Pedersen, 2002).

Value Drivers

E-business value rests on a business model that responds to relevant value drivers. We think that certain key aspects of the e-business model will play a key role and possess the power of influencing e-business value directly and significantly. We have adopted a framework of value drivers in e-business developed by Amit and Zott (2001). Empirically, they identified four interrelated value drivers: Efficiency, Complementarities, Lock-in, and Novelty.

New transaction mechanisms in the markets are based on lower transaction costs and improved market efficiencies. These efficiency gains affect delivery times of both resources from suppliers and partners upstream, and finished goods to customers downstream. Disintegration of the value chain, e.g., with more business activities outsourced, taking advantage of economies of scale in production or eliminating intermediaries in the delivery channels (disintermediation), also leads to efficiency gains. *Efficiency* is our first category of value drivers.

Horizontal integration of products, services and information based on complementary components leads to increased convenience and lower transaction costs for the customers. Complementarity values may occur in channel options in which customers for instance are given the possibility of browsing through product catalogs online, and buy offline. Furthermore, horizontal integration on the demand side, e.g., by creating virtual communities of customers, may create demand externalities. *Complementarities* constitute our second category of value drivers.

Communication in electronic networks creates opportunities for new types of interactions and relationships. It enables both sellers and buyers to play new roles, and it enables both parties to collect and store more information about each other. It has been claimed that due to lower search costs on the Internet, customers will shop more for the best buy. Thus, it will be difficult to build long-term customer relationships. However, the Internet offers other opportunities for relationship building, e.g., personalized web sites, customized products based on stored profiles, proactive customer support through all

phases of the product life cycle, and through branding and trust building. Our third category of value drivers is entitled *customer retention*.

The e-business environment embedded in the new business models should be the basis for strategic consideration of any business firm. Only through explicit choices can value creation through e-business be exploited. The positioning of the firm in the value creating system is a result of creative and innovative decisions. These innovations include the development of new products and services, new production processes, as well as new transaction exchange mechanisms. Our last category of value drivers corresponds to the novelty concept of Amit and Zott (2001). We call this category *innovation*.

The value drivers represent the key opportunities for creating new values in e-business and are derived from the new relationships among participants in the value network, including suppliers, partners, competitors, and customers.

Research Framework

Research contributions and theories in the areas of e-business-related value creation, business models and value drivers, provide us with the basis for suggesting the following research framework based on which we investigate value creation through e-business. Much like Earle and Keen (2000), we posit that value in e-business is created if and only if firms adopt e-business models that respond to relevant e-value drivers. Our research framework is depicted in Figure 3.1. We should stress that the four value drivers are interrelated.

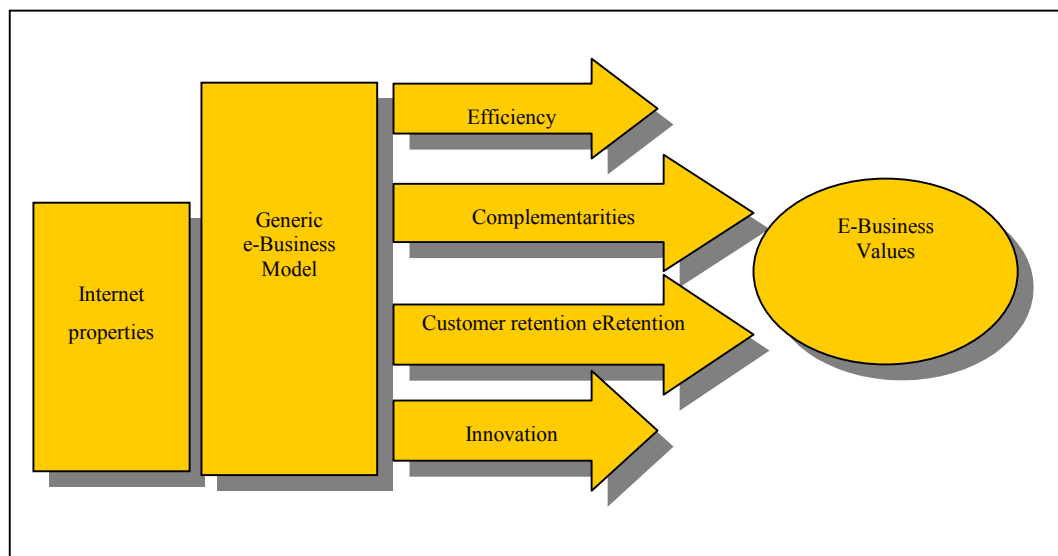


Figure 3.1: Research Framework

4. Methodology

In order to get insights into e-business value creation across industries, enterprise sizes, and geographical locations, a survey was conducted in Norway in 2002. A web-based questionnaire was designed to collect empirical data of current e-business practices and e-

value creation. The questionnaire was constructed with our conceptual research framework in mind. Relevant parts of the questionnaire are provided in Appendix A.

Some 4,500 enterprises were invited to participate in the survey. Only enterprises actively engaged in e-business were asked to fill in and return the questionnaire. According to Statistics Norway¹, only about 13% of Norwegian enterprises were involved in or had plans to take up e-business in 2001. Consequently, we could not expect that many of the 4,500 enterprises to respond to our invitation. We ended up with 330 analyzable questionnaires. Generally, a response rate of less than 10% does not seem sufficient. However, considering the fact that perhaps only 600 to 700 of the enterprises are actively engaged in e-business, the response rate appears to be quite satisfactory.

Due to the fact that so few Norwegian enterprises have documented e-business experience - let alone being involved in e-business at all - our data analysis is strictly exploratory in that we refrain from drawing firm conclusions. Our exploratory data analysis is based on common statistical procedures such as descriptive statistics, cross tabulations, and exploratory factor analysis. All in all, even though we refrained from formal analysis of correlations, and therefore were unable to test our (multivariate) research model, we think we have exploited the data to a satisfactory extent.

Our sample consists of small, medium-sized as well as larger enterprises from all industries and from all over Norway. Close to half of the responding firms report annual sales of 100 million NOK or less. Almost two thirds of the enterprises are truly medium-sized. The average annual sales revenue of the total sample is about 1 billion NOK.

Generally speaking, the participating enterprises have fairly limited experience with e-business. More than one third of the enterprises have conducted e-business for one year or less, and some 60% have been involved in e-business for two years or less. On the other end, 14% of the enterprises report that they have more than four years of e-business experience.

Most of the enterprises are typical “clicks-and-bricks”, i.e., companies for whom e-business count for only a certain percentage of the total business. Generally, a rather small portion of business activities appears to be conducted online. For example, about two thirds of the enterprises report that 5% or less of their revenue is generated online. More than 20% of the enterprises report that all their revenue is generated offline. The average is 11.6%. Apparently, online business is not particularly widespread among the responding enterprises.

5. Results and Analysis

Value Indicators

The enterprises were asked if they had experienced significant changes in key economic and financial indicators since they took up e-business. More than 75% of the companies in our study report no sustainable changes in such indicators as sales, sales per employee, and number of employees. Similarly, about 85% of the respondents report no changes in gross profit margins, return on investments (ROI), and return on equity.

¹ Statistics by subjects: 10.03, Technological Indicators, Statistics Norway, Oslo (www.ssb.no).

This may suggest that economic and financial indicators are influenced by many factors that work in different directions. Also, it may reflect that many companies in our study have a fairly limited experience with buying and selling online. In fact, many companies have just started on the e-business track. Consequently, it is probably too early to draw conclusions with regard to value creation stemming from online business. Apparently, significant changes in economic and financial indicators are not manifested overnight.

Table 5.1: Change in Economic and Financial Indicators

	%	Increase (1-2)	No change (3)	Decrease (4-5)	Aver. score
Sales revenue		21.4	75.9	2.7	2.77
Sales per employee		20.9	77.4	1.7	2.77
Number of employees		9.0	76.8	14.2	2.85
Gross profit margin		14.8	83.5	1.7	3.04
Return on investment		13.1	84.7	2.2	2.88
Return on equity		10.8	86.9	2.3	2.90

Value Drivers

The respondents were asked if e-business had contributed to the achievement of *efficiency* gains. Specifically, they were asked to indicate whether e-business had increased sales volumes, the products and services varieties, and geographical reach. Likewise, they were asked if e-business had led to a decrease in lead times, the number of intermediaries, the number of errors and/or returned goods, and – perhaps most importantly – costs.

Table 5.2: E-business Efficiency Gains

<i>E-business leads to (%)</i>	Increase (1-3)	No change (4)	Decrease (5-7)	Aver. score
Sales volumes	23.8	74.9	1.3	3.68
Product varieties	29.1	68.9	2.0	3.60
Geographical reach	30.5	68.2	1.3	3.57
Lead times	13.2	70.2	16.6	4.01
No. of intermediaries	8.0	80.0	12.0	4.02
Errors/returned goods	5.3	81.5	13.2	4.10
Costs	15.2	57.6	27.2	4.17

Between 68% and 75% report that e-business has not led to any increases. Likewise, between 70% and 82% indicate no changes in the latter group of indicators. Costs seem to be an exception. About one fourth of the enterprises have seen cost reductions due to e-business. On the other hand, as many as 15% report that costs have increased, whereas the remaining 58% do not attribute cost increases or decreases to e-business, or simply have not seen any notable changes in costs.

Cost increases are generally attributed to the development, implementation, operation and maintenance of new computer systems. In this regard, expensive consultants are mentioned in particular. This may be due to the fact that many enterprises have implemented integrated enterprise systems such as SAP or dedicated solutions such as e-procurement, each requiring extensive consultant assistance and support. Also, general IT costs have increased in some firms.

Cost reductions are mostly related to transaction costs. Typically, many firms have reduced their costs by implementing electronic procurement, sales order processing, invoicing, etc. For instance, EDI contributes to significant reductions in administrative costs. In banking, cost reductions are achieved through online banking, i.e., customers do most of the work associated with a transaction.

Our investigations of the associations between efficiency and the financial value indicators show that the few enterprises that report improved efficiency in terms of increased sales volumes, product varieties, and geographical reach, also report a general increase in sales revenues and profitability. Furthermore, the few enterprises that report improved efficiency in terms of a reduced lead times, number of intermediaries, returned goods, and costs, also tend to report some increase in sales revenues. These enterprises also report a reduction in number of employees. The remaining measures of profitability, however, are generally unchanged.

Our next group of indicators pertains to *complementarities* as a value driver. Specifically, respondents were asked to indicate whether e-business to any degree had contributed to such things as a wider product variety, product bundling, a simpler buying process for the customer, collaboration between partners (inter-firm transactions), and integration of activities in the value chain.

The general impression is that enterprises have failed to exploit the opportunity to create complementarities. For all five indicators, the “1” mark (“to a very small degree”) was checked more often than any other alternative. “Simpler buying process” represents an exception in the sense that as many as one fourth of the respondents reported that e-business had contributed to a simpler buying process. However, we have no possibility to verify this perception with the customers themselves.

Generally speaking, collaboration in e-business is rather limited. Typically, less than 12% of the firms have extensive collaboration with business partners, while more than half the sample indicate collaboration within certain limits.

Table 5.3: E-business Effects on Complementarities

<i>E-business leads to (%)</i>	To a small degree (1-2)	To some degree (3-5)	To a large degree (6-7)	<i>Aver. score</i>
Wider product variety	41.1	51.4	7.5	3.15
Bundling of products	40.4	50.0	9.6	3.23
Simpler buying process	28.8	47.2	24.0	3.92
Partner collaboration	35.9	52.4	11.7	3.43
Integrated value chain	37.2	53.8	9.0	3.33

A closer look at the complementarities value driver and the financial value indicators reveals a strong association between a large degree of e-business enabled complementarities and a general increase in sales revenues, sales revenue per employee,

gross profit margin, and return on investments, respectively, as well as a general reduction in number of employees. This may suggest that there is a positive outcome from creating and exploiting complementarities.

As far as *customer retention* is concerned, respondents were asked to indicate whether e-business had contributed to such things as personalization of products and services, easy access to information about individual customers, customers' access to more information or knowledge, making it harder to switch supplier, customization of products and services by customers themselves, bonus or loyalty programs, and virtual communities.

Consistent with the previous discussion of complementarities, the responding enterprises indicate that e-business has created added value for the customers. A majority of the enterprises report that e-business has given customers access to more information about products and services. Previously, this information had to be collected by the supplier and made available to customers via telephone, facsimile, direct mail, etc. For the other six indicators, the pattern is somewhat different. Personalization is still rather uncommon. The same goes for loyalty programs and virtual communities. Perhaps this is because these efforts work in some industries and not in others?

A closer look at customer retention and the financial value indicators reveals a relatively strong association between a large degree of e-business enabled customer retention initiatives and a general increase in sales revenue per employee, gross profit margin, and return on investments, respectively. Again, this may suggest that efforts in the area of e-business enabled customer retention bring about positive outcomes for the enterprise.

Finally, respondents were asked to indicate whether e-business had created opportunities for *innovation* in terms of new products and services, new product features, customer-driven pricing, first mover advantages, new transaction mechanisms, customized information directly to customers, and interactive dialogue with the customer.

Table 5.4: *E-business Effects on Customer Retention*

<i>E-business leads to (%)</i>	To a small degree (1-2)	To some degree (3-5)	To a large degree (6-7)	<i>Aver. score</i>
Personalization	40.8	51.5	7.3	3.12
Customer information	30.5	51.1	18.4	3.64
Information to customers	16.4	44.3	39.3	4.61
Ease of switching supplier	39.7	53.9	6.4	3.11
Customization	36.4	51.5	12.1	3.30
Bonus/loyalty programs	50.0	44.3	5.7	2.68
Virtual communities	48.6	44.2	7.2	2.83

The statistics indicate that e-business only to a limited extent has fostered innovation. A notable exception is the ability to customize information and present it directly to the customer.

Table 5.5: E-business Effects on Innovation

<i>E-business leads to (%)</i>	To a small degree (1-2)	To some degree (3-5)	To a large degree (6-7)	<i>Aver. score</i>
New products/services	40.6	46.8	12.6	3.33
New product features	39.2	46.8	14.0	3.36
Customer-driven pricing	50.0	44.4	5.6	2.75
First mover advantages	49.3	43.0	7.7	2.82
Transaction mechanisms	48.2	42.6	9.2	2.87
Customized information	32.4	44.4	23.2	3.76
Interactive dialogue	41.5	44.4	14.1	3.23

We looked at the relationship between innovation and the financial value indicators. The analysis revealed a strong association between the degree of e-business enabled innovation and a general increase in sales revenues, sales revenue per employee, gross profit margin, return on investments, and return on equity, respectively. Thus, our research indicates that those enterprises able and willing to exploit new business opportunities enabled by e-business, stand a good chance of reaping some significant financial benefits.

To summarize, we find that, only with a few minor exceptions, the e-business value drivers are clearly associated with the financial value indicators.

6. Discussion

For most of the enterprises participating in this study, there have been no significant changes in key economic and financial indicators since they took up e-business. A solid majority of the firms also report that their involvement in e-business has not led to improvements in such indicators as sales volumes, lead times, number of intermediaries (between manufacturer and customer), and costs. Apparently, e-business value creation has been – and is - slow. Our research offers a few potential explanations, some of which are:

- E-business value creation, like all business value creation, takes time. Payoff from investing in e-business does not come easy, and definitely not instantaneously.
- E-business value creation depends on what enterprises intentionally do with regard to what, where and how they conduct e-business. Strategic alignment of Internet properties with new and creative business processes is called for.

In general, the “bricks-and-clicks” has a somewhat limited e-business experience. Consequently, it is probably too early to draw conclusions with regard to e-business value creation. The future, however, holds a lot of promise. Our research indicates that the more e-business experience an enterprise has, the more substantial benefits are reaped and the more e-business value is created. This is not only because there always is a time lag between investment and payoff. Also, experience makes enterprises more e-business mature and, subsequently, more capable of exploiting the benefits of online business.

Our research has been preoccupied with the value impacts of e-business conduct. Our hypothesis was that e-business value is created if and only if enterprises adopt business models that respond to relevant e-business value drivers – irrespective of the size of the enterprise and the industry it belongs to. For example, involvement in cross-industry value networks together with other firms, small and large, may in some cases be the appropriate basis for an e-business model.

To the extent that enterprises report value creation through e-business, our research clearly suggests that there is a relatively strong association between value creation and e-business conduct. Specifically, we have analyzed the value impacts of the four e-business value drivers.

As far as *efficiency* is concerned, we find that those enterprises reporting that e-business has led to increases in sales volumes, product varieties, and/or geographical reach, also demonstrate a general increase in the economic and financial indicators, most notably the profitability measures. Those same enterprises also tend to be more involved in online business, i.e., they are scoring high on the percentage of total business that is transacted online. Our findings leave the impression that more online business – both absolutely and relatively – is associated with economies of scope, that is, efficiency gains obtained by increasing the variety of goods and services offered by the firm, or increasing the market size. This in turn impacts the firm's profitability.

Those enterprises that report that e-business has led to reductions in lead times, number of intermediaries, erroneous or returned goods, and/or costs, also report some increase in sales revenues, as well as reduction in number of employees. Profitability, however, is generally unchanged in these firms. Our findings suggest that efficient online business, combined with a wider market scope, tends to improve the competitiveness of enterprises, both in terms of prices and the ability to deliver to the customers' satisfaction. Thus, sales will increase whereas the firm's profitability may not be affected.

In particular, costs may serve as a primary e-business value driver. It is generally believed that online business will lead to significant changes in the firm's cost structure. Our research indicates that online business is associated with reductions in transaction costs but, for the time being, these benefits are overshadowed by development and implementation costs associated with new and upgraded application systems.

Complementarities are key features of any e-business model. The Internet presents opportunities for both horizontal and vertical integration. Firms with a proven record as far as complementarities are concerned, also report a general increase in sales revenues and profitability. Moreover, these firms have seen a general reduction in the number of employees. We may assume that horizontal integration in terms of a wider product variety and bundling of products, combined with a more convenient buying process, help to meet the requirements of more customers, thus increasing sales at an ever decreasing average cost.

Actions and initiatives directed at *customer retention* are quite rare. Undoubtedly, the opportunities are of high potential. In the future, we will most likely see a significant increase in initiatives such as personalization, customization, loyalty programs, and virtual communities. A large degree of customer retention initiatives is associated with a general increase in sales per employee as well as profitability. Much like complementarities, however, a larger degree of customer retention initiatives is associated with increased costs. This may be due to the fact that enterprises would have to develop new systems to support these initiatives. For most firms, these costs still exceed any direct payoffs.

Our research leaves the impression that e-business only to a limited extent has fostered *innovation*. As with the other value drivers, prospects for the future are promising. It

takes time to implement such novel actions as customer-driven pricing, interactive dialogue with customers, and new transaction mechanisms such as auctions or exchanges.

It turns out that a large degree of e-business enabled innovation is strongly associated with a general increase in sales and profitability. Most likely, new products and services as well as new product features lead to increased sales. Customized information pushed directly to customers probably has the same effect.

To summarize, our research reveals a relatively strong relationship between the creation of e-business value and e-business conduct. Also, our *a priori* value drivers represent key aspects of e-business conduct. Consistent with the findings of Amit and Zott (2001), value creation through e-business can be achieved only by continuously developing and improving business activities associated with these particular value drivers. Success in this respect requires some thorough rethinking on part of responsible managers. In particular, it should be recognized that e-business conduct is not like regular business conduct. Among other things, key value drivers are different.

7. Conclusions and Implications

This research confirms the fact that e-business is in its infancy. Moreover, in addition to a fairly limited e-business experience, the participating enterprises seem to have put all their efforts into relatively simple and primitive e-business solutions. Hence, the power of the Internet is wasted on solutions that basically support the automation of existing and traditional business processes, cf. the phrase “paving cow paths” (Hammer and Champy, 1993). Good examples of enterprises that are using the Internet to create new and innovative business processes and procedures, i.e., business transformation, are rare.

E-business value creation is slow because enterprises, even though they took up online business quite early, have failed to emphasize strategic alignment, business transformation, and business process redesign. This is probably somewhat counterintuitive because most respondents seem to have the impression that they are pretty much well off as far as effective use of ICT and the Internet are concerned. Participating enterprises report that they are fairly advanced in terms of web-based information systems. They have been on the SCM, CRM, and ERP bandwagon for several years, and some of them are in the process of developing and implementing new and upgraded applications in these same areas.

It is our contention that many enterprises have been preoccupied with the technology *per se*. Apparently, it is more convenient to focus on readily available software and hardware than asking question about what creative and innovative initiatives one could take. Likewise, it can be argued that politicians and policy makers have been equally concerned about technological issues, e.g., convergence, security, authentication, international standards, bandwidth and other issues related to ICT infrastructures. In sum, too much attention has been paid to technologies and applications and, unfortunately, too little attention has been paid to the commercial conditions for success and, ultimately, value creation and competitiveness.

Surely, it takes time to reap the benefits of Internet-based business conduct. Pay off from investments in e-business typically takes some two to four years to materialize. Therefore, enterprises and their managers should be both committed and patient.

The most important factor, however, has been and is e-business conduct. If business managers are interested in creating sustainable business value, they should do their utmost to exploit all those Internet properties that have the potential to impact business

models and the subsequent value creation. Hence, the main challenge for managers is to design, develop, implement and operate appropriate e-business models, i.e., business models built up around the properties of the Internet, and with the potential of having significant impacts on the key value drivers.

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Appendix A: The Web-based Questionnaire

Session 1 – eBusiness, Results, and Profitability

Session 1, devoted to the enterprise's size (sales), e-business experience, share of online business, general results, and profitability, provided the following questions:

<ul style="list-style-type: none">• The enterprise's annual sales revenue in 2001 (a measure of size)
<ul style="list-style-type: none">• How long the enterprise has been involved in e-business (a measure of experience)
<ul style="list-style-type: none">• Share of (percentage of total) online revenue
<ul style="list-style-type: none">• Sustainable changes in total sales revenues since the enterprise took up e-business• Sustainable changes in total sales per employee since the enterprise took up e-business• Sustainable changes in total number of employees since the enterprise took up e-business• Sustainable changes in gross profit margin since the enterprise took up e-business• Sustainable changes in return on investment since the enterprise took up e-business• Sustainable changes in return on equity since the enterprise took up e-business

Session 2 – eBusiness Impacts

Session 2, focusing on e-business impacts, consists of questions related to the four value drivers (efficiency, complementarities, customer retention, innovation):

EFFICIENCY Has e-business led to an increase or a reduction in:
<ul style="list-style-type: none">• Sales volumes• Product and services varieties• Wider geographical market reach• Lead times (from order to delivery)• Number of intermediaries (from manufacturer to customer)• Errors and/or returned goods in conjunction with transactions• The enterprise's costs (to be specified separately)
COMPLEMENTARITIES To what degree has e-business contributed to:
<ul style="list-style-type: none">• A wider product variety• Complete product solutions (bundling)• Simpler buying process• Partner collaboration (inter-firm transactions)• Integration of the value chain
CUSTOMER RETENTION To what degree has e-business contributed to:
<ul style="list-style-type: none">• Personalization of products and services• Access to more information about customers• More information and knowledge available for customers• More difficult for customers to switching supplier• Customers can customize products and services• Bonus and loyalty programs• Virtual communities (e.g., for experience sharing)
INNOVATION To what degree has e-business contributed to:
<ul style="list-style-type: none">• New products and services• New product (or services) features• Customers may indicate their needs and what they are willing to pay• First mover advantages• New transaction mechanisms, e.g., auction, market place, etc.• Customized information directly to the customer• Interactive dialogue with the customer (decision support, etc.)