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The Role of Trust in Business-to-Business Electronic Commerce

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Abstract

Lack of trust is a major reason for many companies to take a cautious stance towards business-to-business electronic commerce. Especially innovative business models such as online business-to-business marketplaces face the task of not only having to give their members and partners faith in their own capabilities and reliability, but also to ensure that the respective parties interacting through them have trust in each other. Therefore, we develop a framework of analysis that serves as a means to discover holes in the trust landscape of such marketplaces. This framework is based on a thorough discussion of the notion of trust, that of trust-related trends as well as an analysis of the roles and objects of business-to-business electronic commerce. This discussion shows the challenge but also the opportunity for marketplaces as intermediaries in virtual relationships that lies in a comprehensive understanding of the concept of trust. Furthermore, we believe that it gives a foundation for transferring the general understanding of trust not only to our application for a framework for business-to-business marketplaces but also for other online intermediaries.

Introduction

Trust plays an essential role in business. It is part of every structure, business process and transaction. Without trust these mechanisms would be far more venturous for every party (Das and Teng 1998). The internet is now changing these structures, business processes and transactions. It is situated in internet that the nature of trust seems to be more difficult in these media than in "ordinary" business. New media is mostly anonymous and impersonal, without receiving visual signals of its gene, which we regard in our conventional communication as a natural part.

Until now, the problem of trust in the digital economy has been understood primarily as one of how to guarantee the security and privacy of transactions. But trust in the digital economy is not just about bits or bytes. It is about social relationships, and about building networks that deliver what they promise, be it a product, a collaboration, or simply reliable information. Online trust, like everything else online, is constantly evolving in how it is created and how it is used. We found extensive research on individual determinants of trust, but we did not find frameworks for managing trust in a special business context for example business to business (b2b) e-commerce. A new study by market research firm Jupiter Media Metrix Inc. released in March 2001 found that 45% of managers blame the lack of trust as a reason for the slow acceptance of b2b e-commerce (Computerworld 2001). Therefor the research question of this paper is how management can study the problem of trust in the b2b business context systematically and efficiently and initiate suitable measures to establish a trustful business environment. With a valid framework for managing trust, one could identify which determinants of trust to stress, detect white spots, and integrate different tools and methods to an overall trust strategy (Birkhofer 2000). The goal of this research paper is to provide a framework for managing trust in b2b e-commerce.

The paper starts with an analysis of trust in the field of e-commerce, beginning with some media trends of the digital economy culminating in a working definition for trust in the field of e-commerce. Then we provide a deeper insight in the elements that have an influence on trust in b2b e-commerce. As a result of this analysis we span a framework for managing trust in this business context.

Trust and B2B E-Commerce

Trust Related Trends of the Digital Economy

The underappreciation of trust in management literature in the past and the overwhelming interest in trust nowadays could lead to the assumption that the major trends of the digital economy and non-trust or distrust are directly related vulnerabilities (Barney and Hansen 1994). To show a correlation between the digital economy and trust, we begin by studying some exemplary trends of the digital economy and examine their influence on trust (Zerdick et al. 1999).

The first trend we study is the mega trend of globalization, which is accelerated through new media (Zerdick et al. 1999). Communication around the world and around the clock is possible at marginal costs. But this connected world is lacking of a consistent basis for doing business globally. Technical standards, especially necessary for business-to-business (b2b) e-commerce are evolving now. But global transactions between businesses without consistent business behavior patterns, like a legal framework that serves as a solid basis, are risky for both partners. A surrogate is needed for this lack of the basis. We believe that trust can serve as such a surrogate, to fill up the gaps in business behavior pattern.

Another trend, that seems to be important investigating the role of trust are shortened life cycles in the digital economy (Schmid 2001). Especially the tremendous shortening of the time-to-market, the time span from the idea of a product or service until its realization, is pointed out in literature. Where years where necessary in the past, months are necessary today. Companies that enter the market in the mature-stage of the life cycle are most disadvantaged. These entrants have a relative low response to their marketing, grow more slowly and have a lower response to their product quality, compared to earlier entrants (Shankar at al. 1999). The speed, that is required from companies in order to enter as a first mover or in the growth stage, leads to necessity of taking expeditious business partnerships. The lack of reputation from long term business partnerships requires a surrogate again and trust could serve like this.

The last trend we study is the convergence of different industries. It is an evolutionary process, in which the formerly independent media, telecommunication and information technology sector are melting together (Zerdick et al. 1999). This merging process is affecting technologies as well as value chains. The digitalization of information is the basis and the driving force behind this development (Zimmermann 2000). As a result of this convergence the companies have to deal with new business partners more than in the past (Evans and Wurster 1997). Due to the rapid evolution, business partners sometimes have not perceived any reputation. Therefore the business partners need to minimize the risk of being tricked. In many cases the transactions can be secured by impersonal, third-party institutions (Smith Ring 1997). These third party institutions are reducing the risk and serve as trust catalysts.

Definitions

The further investigation of trust begins by searching for a definition of trust that provides a conceptual foundation for a discussion of the role of trust in b2b e-commerce. Due to its complexity, the concept of trust was picked-up and conceptual defined by a number of research disciplines for long time (Misztal 1996). Currently the concept of trust receives a renaissance. Both, in the U.S. and in Europe, governments are establishing a legal basis for a trust certification infrastructure and organizations assigning seals of approval for internet business are founded. A query in the Business Source Premier database, which provides full text for 1,685 scholarly business journals, regarding the term trust provides 5773 search results within the last 5 years, where the term trust is part of the header. Another query at the Forrester Research institute provides 50 search results for the term trust. Although this is a non-representative snapshot, the results are showing a lively interest and a variety of definitions on trust.

Beginning, independent from the research discipline, at Seligman, where trust is defined as an essential component of all enduring social relationships (2000), touching Arrow, more business specific, where trust is seen as a part of every commercial transaction (1972), we are approaching the term trust in the context of business and management. There, trust has commonly been defined as positive expectations about another party's motives in situations entailing risks (Das and Teng 1998), a venturous pre-effort (Luhmann 1989), "the mutual confidence that no party to an exchange will exploit another's vulnerabilities (Barney and Hansen 1994) and an instrument to reduce information complexity in an uncertain situation (Einwiller et al. 2000). We approve these definitions of trust and stress the attribute, that most definitions have in common: The situation of uncertainty or risk. As many other authors we believe that the notion of risk and uncertainty is at the core of the trust concept (e.g. Deutsch 1960, Wicks et al. 1999).

In the context of b2b e-commerce, the definitions have to be adapted by the specifics of media. Business media are serving as a basis for economic value creation and contain rooms, platforms, and mechanisms, realized by information and communication

technology (ICT), enabling communication or exchange between agents (Schmid 1998). Namely electronic markets are manifestations of business media (Schmid 2001). Again, trust plays a major role in transactions, where uncertainty and risk is involved. If a transaction is realized virtually with the help of business media, the chance of information asymmetries is even higher than in a traditional transaction, because the players do not have the chance to inspect the partner, product, or service physically. This lack of physically inspected information compared to traditional face-to-face relationships has the consequence that electronic transactions are more risky. In addition to these information asymmetries the rapid technical and organizational evolution of solutions in b2b e-commerce is leaving the user acceptance behind. While the development of the products has been shortened tremendously and the productivity increase is an order of magnitude, the user acceptance is still function as slowly or as quickly as in the past (Schmid 1999). Trust in the opportunities, new media is providing, seems to be a critical factor. Therefore we define trust as an effort of the actors of an electronic transaction that they have to bring up regarding the partners, products, or services. This effort is associated with taking risks and dealing with uncertainties. A lack of trust would be a barrier inhibiting transactions between actors who are unfamiliar to each other.
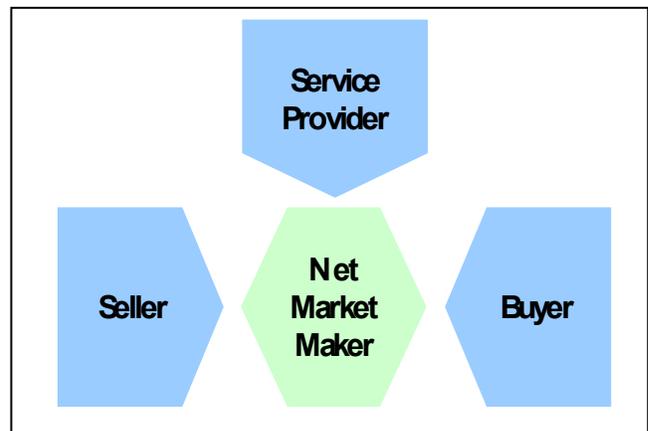
Elements for a Framework on Trust in B2B E-Commerce

Roles in B2B E-Commerce

The next step is to take a closer look at the roles taking part in an ordinary electronic transaction between companies. We define roles as a task profile aligned with certain rights and liabilities. The different roles in a business transaction determine its organization structure.

The simplest form of an electronic transaction would be a buyer-seller constellation without an involvement of other participants. Goods, services, information and probably rewards would be exchanged only between one buyer and one seller. Both the seller and the buyer have to generate an effort. Therefore both sides have to trust each other. The one who is awaiting the effort of the partner in the transaction takes the role of the confider.

Today, a part of b2b commerce is handled through electronic marketplaces, whose agents take up an intermediary role in the value chain between the buyer and the seller. These new electronic marketplaces are supporting the electronic market transaction in several ways. With the aggregation of the buyer and/ or the seller side, today's benefits of electronic marketplaces are in the information phase of a buyer-seller transaction. The market action, especially finding a business partner, is getting more transparent. More benefits are to be expected when the intention phase, the contracting, and the

Figure 1. Roles in b2b E-Commerce

settlement phase are realized electronically. The role of the electronic market maker and its relations to the buyer and the seller have to be reflected, because they could have a major impact on aspects of trust.

Furthermore other roles, commonly called service provider play a role in b2b e-commerce. They are providing a service to support the electronic transaction between the partners. They can either be fully integrated in the electronic marketplace without being noticed as an independent service or support the electronic transaction as a stand alone service without any connection to an intermediary market maker. A lot of alternatives on a continuum between the described extremes are possible. Examples for service provider can be banks as payment provider, handling the financial flows, logistic service provider, managing the physical flow of the product, insurance companies covering parts of the transaction or other types of service companies adopting related tasks. Their influence on trust in b2b e-commerce has to be taken into account, too.

All these different roles, the buyer, the seller, the market maker, and the service provider can be performed by identical or different agents (Schmid 1999). I.e. one company as an agent can take different roles, for example the role of a market maker and the role of a seller. On the other side the seller role can be represented by a real or a virtual sales representative of the company that is selling the product or service (Urban 1999). The same example is conceivable with the buyers role with a real purchaser or a shopbot, and with the market maker and the service providers and their different agents handling different tasks.

We believe that the concept of trust in b2b e-commerce has to take account of both. The roles and the agents performing theses roles in the special electronic transaction case.

Objects in B2B E-Commerce

After investigating the roles and agents of b2b e-commerce the next logical step is to take a look at the objects, that are handled electronically between businesses. To understand the connection between Trust and the objects, we apply a two-way classification. The strategic importance and the quality cognition of traded objects.

Commonly, the purchases of businesses are classified in manufacturing inputs and operating inputs. Manufacturing inputs are from a strategically high importance because they go directly into a product, service or process. At the end these inputs are part of the finished product or service. Manufacturing goods and services are industry specific. Operating inputs, in most cases, are not industry specific and include things like office supplies, travel documents, or related services. These inputs are called maintenance, repair and operating (MRO) goods. These goods and services are supporting the processes in the company and will not be part of the finished product or service (Kaplan and Sawhney 2000).

Another classification of goods and services handled electronically between businesses is the distinction between inspection, experience and reliance goods and services. The criteria of this differentiation is if it is possible to inspect the quality of the good or service. In the case of an inspection good, it is easy to verify the quality before it is purchased. These inputs include things like software products where the buyer gets a full trial version of the software for testing purposes. With an experience good or service, only restricted testing of the quality is possible before buying. But while using this good or service, the real quality will be discovered. An example for a product like this are computers, a company is purchasing online. The buyer does not have an idea of the quality of the components and their co-operation, but as he uses the computer the quality can be inspected. In the case of a reliance good there is whether a chance to inspect the quality before purchasing nor while the buyer is using the good or service. An airbag, as a car component, is a typical reliance good. The buyer does not have the chance to inspect any quality aspects of this product while he is driving the car with an airbag. Only in case of an accident, quality aspects of the airbag will be able to inspect.

By applying this two-way classification scheme - manufacturing inputs versus operating inputs and inspection goods versus experience goods versus reliance goods – we can classify the objects of the b2b e-commerce into six categories (see figure 2). We argue that the relative importance of trust is varying depending on the category, because the risk, involved in a business transaction, is varying, too. Transactions with strategically important goods and services are chancier, than those without any strategic importance. The ease of the quality inspection is influencing the risk, too. If a good is hard or unable to inspect, in terms of quality, it will be more risky for the buyer than with a easy inspection. The more risky a transaction is the more trust is needed.

Figure 2. Objects in b2b E-Commerce

Therefore inspection-operating goods and services (category I) are requiring less trust in business transactions than reliance-manufacturing goods and services (category IV). Generally the risk is steady rising from category I to category IV, and therefore the need for trust in business transactions is rising from category I to category IV, too.

Framework for Management of Trust

Based on the elements is possible to built a framework, that takes a business oriented perspective on the trust aspects. It is built by desk research and with the cooperation of e-commerce experts we met at workshops regarding trust. It is not empirically tested so far but we intend to test our framework with our business partners in Switzerland and Germany and expect an important contribution to knowledge in terms of advancements.

The framework relates and interprets the elements, thus providing an instrument for management of trust in a special business context. The framework specifies what has to be considered, when trust is managed in the b2b e-commerce context and provides an according structure. Overall, the framework should give first answers to the research question of this paper which is, how management can study the problem of trust in the b2b business context systematically and efficiently and initiate suitable measures to establish a trustful business environment.

On the horizontal view, we distinguish between agents and objects. We studied these elements in the previous chapter. Vertically we assign the agents to the different roles and the task profiles respectively, namely the buyer, the seller, the market maker and the service provider. The whole model is surrounded an open or closed e-commerce system (see figure 3).

Horizontal view: As each of the agent types provides some rudimentary object necessary for transactions to take place on this type of media, we distinguish between trust in the agents and in the objects they contribute. For example, buyers and sellers contribute the products, services and finances for exchange as objects. The market maker and the service provider supply the underlying infrastructure as objects for the marketplace by forming the supportive network. Both categories have to be filled up with trust bringing instruments or methods, the category of the agent and the category of the object.

Vertical view: Vertically we assign the agents to the different roles, namely the buyer, the seller, the market maker and the service provider. This differentiation enables the trust builder to dispose the different trust requirements of every agent or role. If for example the market maker wants to attract more buyers, he has to focus on the trust that he puts into the seller, the service provider and of course himself. With the framework t market maker he is able to manage his trust building activities

Figure 3. The Aspects of Trust on a b2b Marketplace

efficiently. He needs tools and methods, that support the trust building process between the buyer and the seller, e.g. seals of approval for the sellers, he has to take care of the trust towards the service provider, e.g. through a restricted connection only to service providers with a strong brand name, and he of course has to ensure the trust of the seller in himself, e.g. through a combination of several instruments (e.g. brand building, certifications, seals of approval). Every agents has to distinguish between the agents and the objects themselves and their virtual representations. For example, trust in the seller has the aspects of trust in the agent himself as well as his representation on the platform, and also in the goods he is offering as well as in the representation of this offer on the platform. Any actor on a marketplace has to consider these perspectives when judging the level of trust a marketplace is offering.

System: The horizontal view, the vertical view and the layers are surrounded by the e-commerce system, which is influencing trust. The system is of importance, if for example a market maker wants to attract customers, who are doing their business not electronically but traditionally. Then, no matter how trustful the agents are, the first task will be to convince the business to do some of the b2b trading electronically.

The result is a matrix of relevant aspects of trust on online b2b marketplaces. Especially market makers have to think through this conceptualization from the point of view of all parties involved in the marketplace. But not only for market makers this framework can serve as a managerial grid regarding trust. The management of trust with the given framework denotes a proactive systematic approach. This includes the identification and classification of existing tools and methods, the detection of white spots, and the initialization of selective measures for every role of a business transaction.

Conclusions

Every determinant of trust is important for itself but only an extensive approach will be successful in engendering trust in b2b transactions. We found various instruments which are bringing trust to some objects and agents in the b2b transaction. A public

key infrastructure is suitable for secure transaction of information, a strong brand name to get a good reputation, certifications to ensure good product quality. These examples show the huge variety of trust bringing measures but still management has to follow economic principles when investments are taken. Like in other investments decision makers have to trade off the potential benefits against the costs. Our examination of the products, handled in b2b e-commerce can serve as a basic principle for those decision. Not every product requires the same amount of trust in order to be successfully transacted between business partners. To ensure a trusting transaction environment, a full picture of trust bringing possibilities combined with economic considerations is necessary.

As with any other research, this paper has its limitations. There are a number of issues that we have not been able to address in this research so far. A research task for the future is to determine the correlation between the aspects of trust in b2b e-commerce. We, in our research, did not make any assumption about any existing correlation between several trust aspects in b2b e-commerce. However, there are certain trust aspects that have positive or negative impacts on other aspects. A factor analysis would support a transformation from correlated factors into not correlated ones. With network techniques like the critical path method, it would be possible to show the correlation of a certain transaction. A map of existing instruments, that promise to bring trust into b2b e-commerce, would also be useful. We hope that the our framework could serve as a grid for mapping the existing instruments and this research will stimulate both managers and researchers to think about the wide range of trust managing trust in the b2b environment.

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