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The future role of banks in electronic commerce – trust as the crucial factor of success in "business enabling"

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Abstract – This paper is based on the hypothesis that digital business can only be conducted once the necessary institutional framework has been put in place. Trust – the cornerstone of all business activity – is an indispensable prerequisite to such a framework. This trust is created on the one hand by technology and, on the other hand, by institutions such as banks. And trust is one area in which the banks in particular – despite the threat of disintermediation and their precarious position in the world of e-commerce, brought about by services with such a substantial information content – can tap a vast store of marketing potential. The original reason why banks emerged several hundred years ago was an attempt to mediate between certain market imperfections and conflicts of interest. Banks are, therefore, institutions whose position in society has been built on precisely these imperfections. Accordingly, the banks in today's digital economy will only be able to escape the threat of disintermediation if they once again adopt the role of "business enabler". They will be able to hold their own on the market only if they assume the function of a "trust mediator". This hypothesis derives from analyses of transaction cost theory, but is also based on two empirically representative studies conducted on the subject and which, given a conjoint analytical approach, permit concrete market simulations to be derived. From the point of view of Internet users, such simulations describe the role of the banks as trust mediaries who will in future operate in three dimensions: transformation, transaction cost reduction and trust.

INTRODUCTION

The phenomenal pace of Internet development and the transaction contents now made possible by innovative technologies leave the Internet in its present form poised to enter the digital economy. In this economy, the aim is for all phases of a transaction (inquiry, contractual agreement and processing) to be mapped to a single medium which guarantees the necessary confidentiality, integrity, binding legal nature and traceability. From a rational point of view, the Internet will only take over from "real transactions" if it either adds value for the user or significantly lowers the cost of transactions.

An appropriate legal framework must, however, be flanked by a broad mix of institutional/economic tools and technical instruments whose primary goal is to engender trust in the conduct of transactions and in transaction partners.

This paper begins by outlining the imperfections of electronic marketplaces (chapter 1), from which the need to reduce existing complexities will become apparent. Chapter 2 then describes banks as a form of institution which, since their

very inception, have sought to do just this, but which now find themselves in a very vulnerable position in the electronic marketplace. For the banks themselves, therefore, the issue of disintermediation dominates the current discussion. Chapter 3 goes on to deal with the need for trust, showing how trust evolves and what impact it has. The empirical studies needed to test the theory that "banks will become the business enablers in e-commerce thanks to their role as a bearer of trust" are presented in chapter 4. Finally, the notion of "trust mediation" is introduced both as a concept to enable digital business and as an orientational strategy for banks in the field of e-commerce.

I. DIGITAL BUSINESS – A NEW CHALLENGE

A. *The complexity of electronic markets*

Contrary to the assumption that electronic marketplaces are tending toward market perfection in the sense of the neo-classical microeconomy, closer analysis of the peculiarities of open electronic marketplaces reveals the existence of imperfections (or frictions) which can be seen as a hindrance to the digital economy:

1) *Inherent behavioural frictions:* Given three recognised forms of human behaviour – bounded rationality [1], opportunism [2] and a limited ability to engage in associative thinking in complex situations – human decision-makers are unable to comprehend all the possibilities open to them in the context of e-commerce.

2) *Inherent technological frictions:* The open, decentralised nature of the Internet means that the integrity of every transaction – even a transaction between parties known to each other and who have maintained a long-standing business relationship – is exposed to threats from potential intruders [3].

3) *Frictions inherent in certain types of goods:* On the Internet, a large number of goods are progressing from being goods bought on approval to goods bought on the basis of experience and trust [4] – goods whose quality cannot be verified in advance.

A crucial factor here is the asymmetric distribution of information about transaction costs between all players in open networks; this asymmetry is due essentially to the fact that such marketplaces are not bound to any one physical location or to any given time. As a general rule, the greater the asymmetry in information distribution, the greater the tendency toward opportunistic behaviour and bounded rationality. In other words, the less the transaction partner knows about either the properties of goods and transactions or the legal conditions by which they are governed, the greater is the danger that individuals, as decision-makers of last resort in e-commerce, will make suboptimal choices.

In summary, when they operate as players in the world of electronic commerce, people pose a major and intrinsic threat to the fairness of transactions owing to their limited cognitive capacities and their inability to cope with complex decision-making situations [5]. It follows that not even an "absolutely secure" technology (which, in any case, is not feasible in practical terms) can resolve this problem in isolation. Rather, the said players need to be given a technology they can readily cope with, and one which protects them from potential dangers (resulting from their own actions) by using institutional arrangements to warn them of such threats and offer effective decision support. The objective here must be to foster a sense of trust and security on the part of the users: a trust in and substantiated by the technology placed in their hands, supplemented by economic and legal tools designed to reduce the inherent complexity of e-commerce transactions.

B. Effects of electronic commerce: disintermediation versus intermediation by the banks

Networks and electronic marketplaces typically effect a migration from hierarchic 1:1 relationships to market-like n:m relationships, which juxtapose a number of autonomous suppliers and demanders and permit the "free" exchange of goods and services within a given network. On the network, information and communication (I&C) technology handles the functions of coordination, cooperation and communication between the relevant parties in digital form, in (near) real-time and multilaterally.

Malone/Yates/Benjamin, who apply the transaction cost theory to electronic communication, illustrate the effect of lower transaction costs resulting from I&C technology [6]. More efficient transactions cut the cost of coordination, thereby resulting in the vertical "de-integration" (and, hence, disintermediation) of companies. On this basis, the following effects of the use of I&C technology can be predicted, whereby direct connectivity will cause the tasks and roles performed by the various players to change:

1) *Integration effect*: Concerns the integration of hitherto separate subprocesses in electronic procedures;

2) *Substitution effect*: Concerns the substitution of previous transaction partners by alternative partners (usually more suited to one's preferences);

3) *Intensification effect*: Concerns the intensification of existing interactive relationships by means of an additional (electronic) delivery channel;

4) *Knowledge effect*: Concerns the global availability of knowledge more or less in real time for all market players;

5) *Communication effect*: Concerns the ability to access and process information more quickly, at lower cost and in a more distributed manner;

6) *Broker effect*: Concerns the option which connectivity affords to market players of establishing direct contact with one another, without the need for a broker or intermediary. This effect is also referred to as disintermediation.

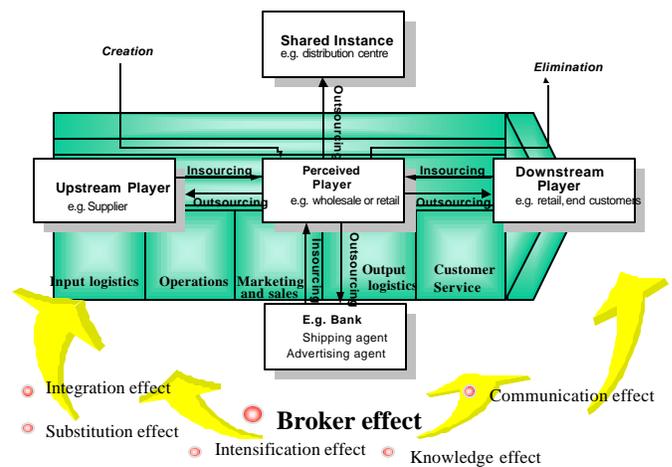


Figure 1: Changing functions in the value chain

The disintermediation argument, postulated above all on the grounds of the increasingly widespread use of digital media as a result of the lower coordination costs afforded by IT [7], primarily affects industries whose products and services have a high information content (e.g. banks, travel agencies, stock exchanges).

In certain submarkets, this may render obsolete the practice of brokering trades on behalf and for the account of third parties, since end customers are now able to contact product suppliers directly. As a result, (trading) functions such as the reclassification of goods, adjustments to meet demand, maintaining market equilibrium and the preparation of physical assets are tasks no longer performed by classical trading companies, but can instead be handled autonomously by each and every transactor within the network. Equally, the geographic venue of a trade, an important factor in physical markets, loses its relevance; nor is the number of transactions now bound by transaction costs associated with the physical distance between the supply and demand sides. The dependent transaction frequency thus takes on the nature of a

"flat line" [8]. Since the spatial dimension has effectively been eradicated, monopolistic intermediaries "in the middle of the market" cease to exist. The function of intermediaries between original suppliers and end customers is thus being transformed by links in the value creation chain such as outsourcing, insourcing, creation and elimination (cf. figure 1). In the same way, the spatial intermediary function of stationary brokers or dealers is rendered obsolete by direct contacts between suppliers and consumers. Retail chains, too, are being modified and, in extreme cases, reduced to a minimalist 1:1 relationship.

Paradoxically, however, it is possible to adopt two opposing lines of argument when using the transaction cost theory to explain the organisational implications of digital business [9]:

1) The falling cost of coordination strengthens market forces, leads to de-integration and, hence, eliminates the intermediaries between the supply and demand sides;

2) The falling cost of coordination makes it cheaper to outsource (sub)processes and therefore reinforces intermediate structures.

In an analysis of various scenarios for the transition from a physical to an electronic market, it is striking to note that only one of four possible scenarios leads to actual disintermediation. In the other scenarios, the existing forms of coordination are merely supported by electronic means. As a result, existing intermediaries can consolidate their position by arguing that the use of I&C technologies has made their "internal" service provisioning more efficient (e.g. by exploiting economies of scale and synergistic benefits), or by providing add-on services that could not be rendered (efficiently) in the absence of I&C technologies. It is even conceivable that dedicated electronic intermediaries (known as "cybermediaries") will emerge (e.g. direct banks). Here, the critical factor will ultimately be the relative information asymmetries that exist between the parties to transactions [10].

Especially in the business-to-consumer sector, and even more so in the case of products with a high information content, the widespread use of digital media is indeed fuelling a tendency toward disintermediation. Notwithstanding, the many and varied frictions in these electronic marketplaces constitute barriers that will militate against the "broker effect". These barriers can be overcome by technological instruments on the one hand and institutional arrangements on the other; a mixture of the two will be indispensable. Even so, whether the broker effect can be deemed generally valid for all industries and both for the business-to-consumer and business-to-business sectors is more than questionable.

II. BANKS AS "BUSINESS ENABLERS" IN IMPERFECT MARKETS

A. *The function of the banks*

Ever since their inception as a special form of financial intermediary, banks have played a dominant role in the "real world". The fact that they exist at all is ultimately the result of information asymmetries or conflicts of interests between the players on capital markets – asymmetries that are intrinsically associated with deficits in the area of trust and security. In the markets in which they operate, banks assume the role of intermediary between the originating transactors.

Rooted in the complexity of the financial markets and in the incompatible interests of the respective players, the key transformation functions performed by a financial intermediary can be subsumed under the following headings [11]:

- Information requirements transformation
- Lot size transformation
- Term transformation
- Risk transformation
- Spatial intermediary function

The object of these transformations is to cut the cost of transactions for the players concerned such that, based on the underlying model theory, the bank would become obsolete if two or more other players could conduct a transaction with less frictional losses (i.e. with lower transaction costs) than the bank, or if the transaction costs were lower than the fees charged by the bank for the exercise of its function as intermediary. Banks handle a very large number of transactions because, in the context of relationships between companies and private and public households, it is exceedingly rare that the tensions between income and expenditure, and hence between opportunity and risk, trust and mistrust, and opportunism and inopportunism, can be brought into equilibrium in respect of a given period. Risk situations and situations where information is unequally distributed are commonplace. This is why the success of banks in e-commerce will crucially depend on whether they can offer a higher quality of products and services with lower transaction costs than other financial service providers.

III. TRUST AS A FACTOR IN TRANSACTION RELATIONSHIPS

Trust is a ubiquitous feature in the life of transactors, and one that is essential to all forms and types of transaction [12]. Particularly in the context of winning new customers and

cementing customer loyalty, as well as in the maintenance of interactive relationships characterised by pronounced information asymmetries, trust is an extremely important economic factor [13].

In the first place, trust is a necessary precondition to overcoming temporal, spatial and preference-based differences (all of which are typical of e-commerce): trust enables business decisions to be made in situations of uncertainty [14]. To put it another way: where there is no trust between parties seeking to deal with one another, it is very probable that a trade will not come to fruition, especially if the transaction partners are unknown to each other [15].

At the same time, however, the evolutionary nature of trust means that is always susceptible to abuse. Such abuse in turn erodes trust. Contrary to the thesis (broadly advocated in scientific discussions) that trust is merely a transient phenomenon, it can therefore be concluded that trust – even in situations where modern technologies are used – must be viewed as an iterative, assimilative process whose historic development will experience highs, lows and turning points [16]. The greater the use of innovative – i.e. as yet unfamiliar – technologies, the more important trust becomes.

Trust develops when individuals (have to) rely on statements by experts, for example, and are themselves unable to verify the conclusions drawn. In this situation, the role played by the organs of state is of paramount importance. For instance, studies indicate a positive correlation between the perceived benefit of genetic engineering and the level of confidence in the legislative regulation of this discipline, and vice versa [17]. Nevertheless, the same example also implies that such confidence is based primarily on evolutionary trust – trust in government institutions and legislation – and is subsequently transferred onto innovative technologies (in this case, genetic engineering). Trust in a service can thus be upheld by appropriate barriers to entry, such as government legislation. One example is the the German Digital Signatures Act (SigG).

The other side of the "perceived benefit" coin is that trust – the assimilation, storage and retrieval of empirical knowledge – can only be nurtured at an (opportunity) cost: capacity must be invested to this end which could have been put to alternative uses [18]. This is why it makes economic sense to establish instances of trust that are involved in transactions and are on hand to assist the players on the Web.

Accordingly, such neutral, trustworthy instances must command twofold trust:

- (1) They must be trusted by the originating supplier, in order to be able to conduct successful evaluations;
- (2) and they must serve as a "trusted third party" (TTP) to customers in order to secure the confidence of the latter.

Satisfying the former requirement has a spill-over effect on the latter: Where a TTP is licensed or accredited by a certified public watchdog organisation, this very fact both documents and communicates quality (in the sense used in

security concepts) to the end customer, who is thus in a position to distinguish between different quality levels and, ultimately, to exercise trust.

Given the necessary dimension of trust and the fact that bank/client relationships are one of the few such relationships that have evolved in the course of history, this paper postulates that the banks, of all players, are ideally placed to engender trust between the various players on open electronic marketplaces. Moreover, this paper further asserts that, precisely because of this situation, the market imperfections discussed above have recently opened up a new opportunity for banks to play a leading role in the economy in the position of trust mediaries, and thereby to ward off the threat of disintermediation.

A key aspect in this process is the modified role of the banks. Their historic origins led them to focus on preparing transactions, seeking out lenders and borrowers and executing capital transactions on their behalf. By contrast, in the electronic marketplace, they will rather play a monitoring and screening role, accompanying transaction partners through their dealings with one another (figure 2).

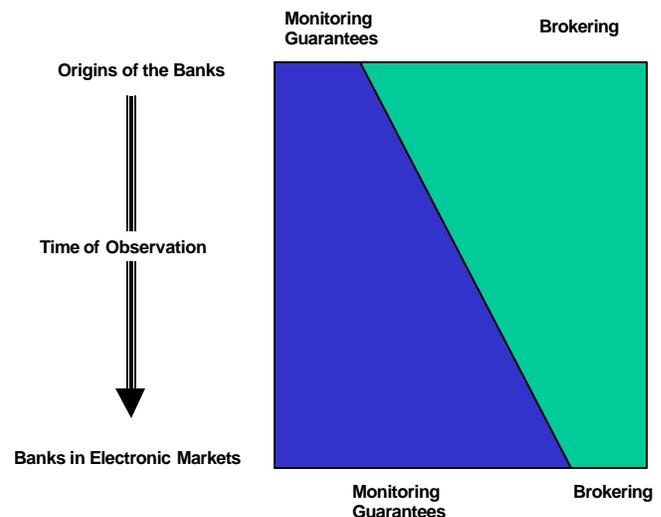


Figure 2: The modified role of the banks

This development can be attributed to the attenuated transaction costs for the actual transaction partners resulting from the use of information and communication technologies. These costs are far lower than in physical markets, such that the intermediary bank has no room to create significant added value through its "agency" function alone. On the other hand, the potential benefit of intermediate structures to the transaction partners is now enhanced owing to the imperfections of electronic marketplaces identified earlier: the banks can now "accompany" transactions, i.e. by covering the risks inherent in electronic transactions. Hence, the core function of banks will be to bring the historic relationship between bank and customer and the trust that has evolved

over time to bear on the interactive relationship between the actual transaction partners in the form of applications and services to accompany their transactions.

IV. EMPIRICAL FINDINGS

A. Motivation for and structure of empirical studies

To test the hypotheses formulated above, two empirical studies on the subject of security and trust in e-commerce were conducted in 1998 and 1999 with the support of Commerzbank AG, Infratest Burke and the Institute for Computer Science and Social Studies (IIG) [19]. These empirical studies were motivated by the need for an in-depth analysis of those factors which affect the concepts of security and trust in the context of the Internet. The overriding goal was to furnish empirical validation for the hypothesis that "banks are the bearers of trust in e-commerce", based on the assumption that a Public Key Infrastructure could be a first technical step towards this function. Further it was a goal to document bank's position in the arena of e-commerce. Furthermore, the studies aimed to identify demand for such bearers of trust from the perspective of private individuals, and to outline the market potential for trusted third parties, encryption technologies, based on digital signatures and certificates and their respective fields of application. An additional objective was to reveal background variables and correlations, and also to simulate specific market scenarios.

An analysis of previous empirical studies in relation to electronic commerce found that the questioning techniques used made it impossible to eliminate the problem of social desirability. As a rule, this mode of questioning precludes satisfactory conclusions about the genuine preferences of respondents. The need is instead for a comprehensive catalogue of questions which embraces a variety of interrogative techniques [20], [21], [22]: a decompositional approach to questions about marketing policy in relation to technology design is absolutely indispensable. This paper can therefore be seen as an attempt to record and evaluate preferences with regard to security technologies for digital networks on the compositional, multidimensional and decompositional levels. Trust, and the need of Internet users for security in electronic networks, formed the central focus of these studies.

The research method used for the first of the two studies was a one-off, primary-source survey in the form of an anonymous "classroom questionnaire" filled in by 220 selected retail customers and customers of high net worth at Commerzbank AG. Having the questionnaires filled in under supervision combined the benefits of written and oral questioning techniques and permitted a quantitative representation of more complex questions. The standardised survey was made up of two parts: a compositional part based on a written questionnaire; and a decompositional (conjoint

analysis) part based on the use of 18 stimulus cards. The overall survey comprised 493 questions. The use of the "limit conjoint" analysis technique also enabled conclusions to be drawn about the size of the market for certificate-based services as a indicator of demand. The idea of using a "limit conjoint analysis" [23] in the context of e-commerce was born at the Institut für Informatik und Gesellschaft and was used in a former research project [24], to show the demand of intermediation in security-services [25], [26].

The results of this study (which should be confirmed by a more diversified panel) were fed into a further study to be presented to an extended random sample (representative for Germany and involving 1016 people). The objective of this second study was to provide a more in-depth analysis of concrete products and applications in the area of certificate-based services: The focus was on specific application clusters (e.g. e-mail, online-banking, online-shopping, online-auctions, local citizen services etc.), within the certificates could be used and on the prices that respondents would be willing to pay for trust-solutions. Here again, a conjoint analysis was performed to enable conclusions to be drawn about specific strategy and product options and to permit product simulations.

Whereas the first of the studies had centred primarily around the issues of sensitivity to market imperfections and the security needs, knowledge and general willingness of respondents to buy, the second study sought to lend a more concrete form to the results of its predecessor, translating generic results into practical scenarios and to confirm the generic results.

B. Selected empirical findings

Conducted on two levels, this research identified both considerable ignorance and a pronounced aversion to risk in relation to technology-assisted forms of transactions (especially payment transactions), particularly among less technologically inclined people. At the same time, a level of trust (presumably based on the reputation of the transaction partner and ignoring the transaction medium) that can only be categorised as "blind faith" was apparent, a finding which proved that respondents were indeed "out of their depth" in the context of dynamic systems [27], and which, surprisingly, occurred irrespective of the respondents' familiarity or otherwise with the use of innovative digital media. Despite these results, there was a clearly discernible trend – with regard both to transactions already conducted over the Internet and to the respondents' preferences – toward products and services which fall into the category of commodities and goods on approval. These results are equivalent to the fact that people strive for security and uncertainty in the same way [28]. Likewise there is a discrepancy between the means of payment used and the preferred means of payment – a clear indication that goods-for-cash transactions like a money transfer or writing a check (postpaid after receiving the goods) are far preferred to digital systems (such as cybercash

or e-cash), where the initializing of the payment-transaction happens before the delivery of the (physical) goods.

At the same time, the threat of fraud, opportunistic behaviour and inadequate data integrity was rated as high across the board; and the need was expressed for instruments and institutions to lower the cost of transactions, to "simplify" the transaction process itself (e.g. transfer speeds, Internet payment systems, agents) and to raise the user's subjective sense of security (trusted third parties, encryption technologies). As a general statement, greater importance is attached in comparative analyses to security-related factors (e.g. confidentiality, integrity) than to economic factors (e.g. transaction costs, availability). One result of a simulated transaction (signing a contract via e-mail) is that the demand for trust centres and the likelihood of unsigned and unencrypted contracts being concluded over the Internet (e.g. by e-mail) can be correlated in part to the individual's personal disposition of risk, which consists of the factors control and risk inclination [29].

The following factors and characteristics can be identified as critical factors of success for a trusted third party:

- Supplier's trustworthiness and reputation
- Supplier's discretion
- Possibility of applying "physical sanctions" in a face-to-face dialog
- Range of banking services on offer
- Internet service providing
- Decentralised service and branch network

Both from a descriptive and from a structural point of view, it was possible to confirm the hypothesis that banks (of all the potential providers of trust centre services) enjoy the greatest trust and are at once most preferred and best suited to fulfil this role. This is due to a variety of factors, of which two in particular stand out: trustworthiness and discretion. The study did not permit a definitive interpretation of the causative reasons for this trust; further research work would be needed on this issue. Notwithstanding, the respondents evidence a substantial affinity to the position occupied by the banks and state institutions, a fact which fundamentally sets them apart from other potential trust centres (figure 3).¹ An definitive interpretation of the dimensions in figure 3 is not possible [22], but nevertheless you can see a "geographical" distance between the group *Telcos/ Others* and *Bank/ Government*.

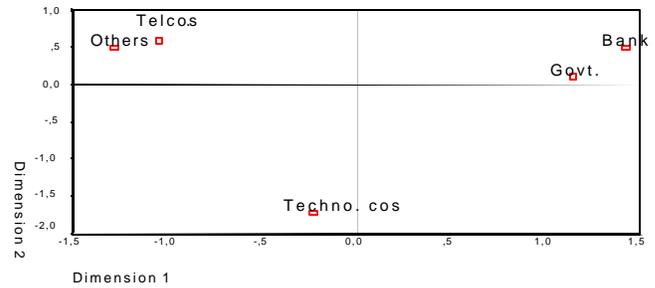


Figure 3: Confidence in potential trusted third parties in the perception of the respondents

Furthermore, the analyses show that the question of liability (in case of technical bugs and/ or fraud in result of loss or theft) is the most elementary and important product characteristics for the product "certificate", but that considerable weight is also attached to the issue of the suppliers and their reputation – over and above the significance of price in relation to such services. In this context, the importance of banking applications as complementary products and the need for means of applying physical and personal contact – in the form of personal contact with the staff of a decentralised branch office structure – also came to light. Similarly, it became apparent that, in the first case study, the volume of effective market demand is influenced predominantly by the way in which liability is regulated and by complementary products. With regard to the issue of certificates, the market simulations performed on the basis of the conjoint analysis gave banks and public institutions a considerable competitive edge (cf. figure 4). Given their core functions and the marked sensitivity of respondents to the issue of liability and to banking applications, the banks also enjoy a strategic advantage.

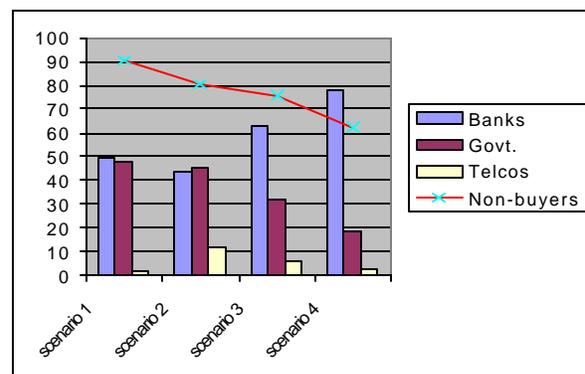


Figure 4: Market simulations and market size for certificates and alternative product packages²

In view of this situation, the willingness of customers to pay a surprisingly high price for elements of a – the SigG considering - public key infrastructure (PKI) in the form of chipcard readers (ø = 81 DEM) and chipcards (ø = 42 DEM

¹ As potential trust centres were considered: Telcos = Telecommunication Companies; Banks, Governmental Institutions, Technocos = Companies of the Technological Sector (e.g. Siemens, Microsoft, IBM) and Others = Companies which are licenced by a authorized trust centre.

² For the definition of the scenarios see appendix.

annual fee). At the same time, banks meet with greater acceptance the greater the personal value of the transactions in which certificates are used and the higher the average price level of smart cards and smart card readers. This trend is probably attributable not least to the signal impact of price and to the reputation of the institutes.

In general terms, the segmentation of benefits enabled clearly delimited target groups to be identified for different potential TTPs. These target groups can be addressed both on the basis of price and with regard to the range of applications for certificates – and, by association, based on the requisite partners. The data material used provides an initial indication that the banks will still be able to assert themselves on the market despite higher prices. Telecommunications and technology providers, on the other hand, are more attractive to the price-sensitive segment of the market. Even here, however, they will only be able to corner a significant share of the market if suitable certificate-based services are provided. Besides certificates, the following factors can also be seen to have an influence on demand: the value of transactions; the purported potential for reducing transaction costs; the confidentiality of communications; the option of personalising and tracing transactions; and convenience. An analysis of the preferred services, where citizens could use certificates, – both from a descriptive and from a structural perspective – reveals a trend toward services of a high-value, personalised and convenient nature should they be offered over the Web: Major preferences centre around municipal services (e.g. requesting a new passport), wealth-creation programmes (e.g. brokerage and banking) and intracompany authorisation and authentication mechanisms (e.g. giving somebody power of attorney). By contrast, the encryption and signing of private e-mails does not constitute a market for smart card based certificates.

The analysis of the banking industry indicates that offering trust centre services would indeed be a useful means of attracting new customers and securing their loyalty. There is also a noticeable trend in favour of privately-owned large banks; the Deutsche Bank brand achieved the highest scores. The benefit segmentation revealed by a (conjoint) analysis of preferences nevertheless found that those institutions in particular that have traditionally been seen as "second banks" (Commerzbank and Dresdner Bank) harbour considerable potential for cementing customer loyalty and that, for this reason, it would be advisable for precisely these institutions to position themselves strategically.

Based on these findings, the multitude of variables can be narrowed down to three key factors which argue in favour of the banks as the bearers of trust in a digital economy and which, hence, can be identified as "critical factors of success". These same factors also represent the starting point for strategic considerations concerning the future role of banks in the electronic marketplace.

V. CONCLUSION: TRUST MEDIATION AS A CONCEPT FOR DIGITAL BUSINESS

Even against the background of these empirical results, the core functionality of a bank – as an intermediary which reduces transactional complexity – coupled with the insights gained from recent institutional economics regarding intermediation and disintermediation shows that banks (as well as public institutions) have the wherewithal to diminish the complexities which currently confront users in the arena of e-commerce. At the same time, the transformation functions that the banks have performed to date give them a competitive advantage over public institutions – and leverage to match.

In view of the technical feasibility of providing trust functions based on digital certificates and a public key infrastructure (PKI) in an online context, banks already have the option of positioning themselves as trust mediaries (i.e. as process entities interposed between the supply and demand sides in order to foster and transform the trust needed for transactions and to provide services which reduce the cost of transactions) thanks to their existing customer base and the leadership and control functions inherent in the nature of corporate customer business [30]. In order to survive in the digital world, this kind of trust mediary must far surpass the efficiency of other (financial) intermediaries. As far as electronic commerce is concerned, this implies the need to exploit economies of scale and synergistic benefits to the full when evaluating the transaction partners involved, in addition to a need for high-quality monitoring. It follows that the future role of a bank need not consist of offering e-commerce because other institutions are doing likewise, nor because of the threat posed by non-banks and near-banks. Instead, the banks should be taking what they already "produce" successfully in the real world and transferring it to the virtual world. The role of the banks in e-commerce can thus be defined in the following points:

- "Enabling business" by exercising transformation functions
- Preparing their clients for the digital economy and thereby safeguarding their own business base
- Distributing "enabling technologies" which diminish risks, such as certificates and PKIs
- Reducing transaction costs across all phases of market transactions
- Cultivating trust in a world of perceived "uncertainty".

The banks' existing strategies for e-commerce, which were originally designed to combat disintermediation, are merely delaying the process that will ultimately erode their business

base; they offer genuine solutions neither to the problems of electronic commerce nor to the threat of disintermediation.

Success in e-commerce will be enjoyed by those institutions who define an electronic business strategy that is function-oriented rather than product-oriented. The focus must be on three complementary functions. A bank cannot position itself as a *trust intermediary* unless it satisfies all the functions illustrated in what is defined as the “T³ model” (figure 5) with consistently high quality: it must offer *transformation* functions, provide *transaction cost reductions* to the originating parties and command the *trust* of the same. Only then will the bank be able to defend itself successfully and over the long term against spread of alternative suppliers.

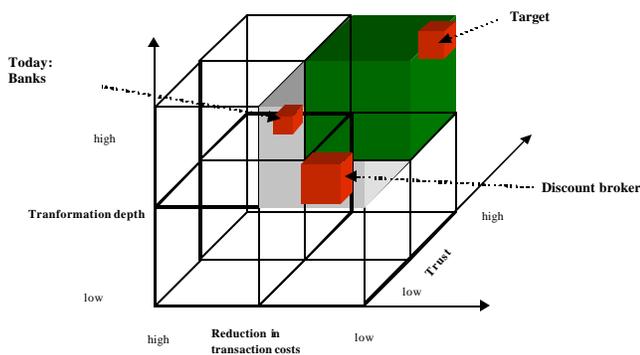


Figure 5: The concept of trust mediation

From a strategic point of view, e-commerce therefore requires the banks to think back to their primary functions: not as a "one-size-fits-all" modern service provider, but starting from the origins of the banking industry and from developments in industry around the turn of the century. On this basis, a functional service can then be developed whose content and function will, in all probability, largely resemble traditional banking business: the transformation of trust, maturities and risks. Sure: there is a kind of chicken-and-egg problem, because the transaction partners need matching technologies and codes. But banks with their inter-bank relationship and the evolutionary bank-customer relationship should have a large potential to penetrate this market. Despite all the technological advances, the laws of economics and their implications ultimately remain unchanged. Tomorrow's banks will be obliged to assume (core) functions that can be subsumed under the heading of "trust mediation". Ideally, their position as "trust intermediaries" will offer the market something that rarely ever exists in practice: a genuine "win-win" situation for the originating transaction partners and the intermediaries alike.

Scenario 1:

	<i>Banks</i>	<i>Government</i>	<i>Telcos</i>
<i>Annual fee</i>	30 DEM	30 DEM	30 DEM
<i>Liability of...</i>	Customer	Customer	Customer
<i>Integrated Payment System?</i>	No	No	No

Note: In the following scenarios the features, written in ***bold italic*** letters, are the changed features in contrast to the scenario before – the other features are static.

Scenario 2:

<i>Liability of...</i>	<i>Until 100 DEM claim: Customer³</i>	<i>Until 100 DEM claim: Customer</i>	<i>Until 100 DEM claim: Customer</i>
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Scenario 3:

<i>Annual fee</i>	<i>60 DEM</i>	30 DEM	30 DEM
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Scenario 4:

<i>Integrated Payment System?</i>	<i>Yes</i>	No	No
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³ Analogous to the rules of the Eurocheque-card.

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