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THE IMPACT OF EBUSINESS ON THE ORGANIZATION OF THE GERMAN AUTOMOBILE SUPPLY INDUSTRY[1]

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The automotive industry is considered a pace-maker in internet-based „Business to Business": On the one hand, the requirements of modular production benefit from intensive utilization of the internet: especially the typical complex value chain within automobile production requires a high degree of coordination between OEM and first-tier suppliers, but also increasingly between the first-tiers and their suppliers (see Lung/Volpato, 2002). On the other hand, and by far more frequently as compared to inter-firm cooperation issues, firms make use of the internet in a competitive, market-spreading way. Especially the purchasing and sales departments use web-based IT technology for their supplier or customer management, or to support strategic sourcing activities (see Chanaron, 2001). Developments in the branch point to long-range variations in inter-organizational structures, internally-operational flows and of the work organization due to the forced utilization of eBusiness-technology.

In the context of the sociological research project „eBusiness in the German Automobile Supply Industry"[3], the utilization of eBusiness technologies in the automobile branch is being examined. The project aims at analysing the primary zones of internet use, as well as the effects on organization and employment. Accordingly between November and December 2002, approximately 2000 German supplier plants were interviewed about their web utilization by means of a representative telephone survey. The study focuses on the fields of application as well as the identification of problems concerning introduction, utilisation

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and organization. In addition, the project investigates six firms by means of intensive case studies.

In this paper we will, based on both quantitave and qualitative data, examine the following questions:

- ✓ On the inter-organisational level, which effects on inter-firm relations are to be expected? Given the lead role of procurement technologies in the automotive supplier industry, what effects can be drawn for the division of labour along the supply chain, in particular, for the decisions concerning "make or buy"?
- ✓ How do enterprises deal with eBusiness? In particular, how do they implement eBusiness-tools and what results can be drawn from the specifics of that process? On the intra-organisational level we will investigate how the implementation of eBusiness is being shaped in those enterprises which initiate eBusiness on an "voluntary" basis as compared to those firms which are being forced to participate.

This paper consists of two parts. First (Chapter 2), we will take a short glimpse at the structure of the supplier industry. In a second step (Chapter 3), the effects of eBusiness will be examined with respect to firms' communication and interaction.

THE GERMAN AUTOMOBILE SUPPLY INDUSTRY

Specifically due to the differentiation of the value chain as it is typically found in automobile production, the question arises how internet utilization differs within the supply industry. Which strategies do the different businesses in the supplier industry pursue, given the background of organisational change? Before we discuss that question, let us briefly summarize the structure of the supply industry. Afterwards, we will suggest a typology of supplier enterprises.

THE STRUCTURE OF THE SUPPLY INDUSTRY BY SIZE

An analysis of the structure of the supply industry has to face the basic problem that this economic sector can hardly be defined. One reason for this is that it is situated diagonally within the current official industry classifications and statistics. In this paper our definition captures those enterprises which produce direct goods that are intended for the production and assembly of automobiles under the label "supply industry". The suppliers of capital goods, C-parts supplier or service enterprising for automobile production are excluded from this definition (for a definition of supply products see Klinger, 1959, p. 1229; see also Hutzel, 1981, p. 43; Schildbach, 1985, p. 10; Rauscher, 1993, p. 16; for the exact definition of the supply industry in the project see Pries et. al., 2002).

Table 1. - *automotive industry by size category*

Size (number of employees)	in %	*number of cases*
less than 10	6.6	*123*
10 to 49	60.4	*1,124*
50 to 249	23.5	*438*
250 to 499	4.4	*81*
500 to 999	2.3	*42*
1.000 employees and more	2.9	*54*
total	100.0	*N=1,862*
Source: own research		

The automobile supply industry is characterized by a heterogeneous size (Table 1). When we look at the number of people employed, the arithmetic means lies with 230 colleagues, while the standard deviation amounts to 1,749 (!). The high level of variation in company size is an indicator for the industry's heterogeneity. The large number of suppliers are small and medium enterprises (SME). Small firms, with 1 to 50 staff members, form the majority of firms, with 67%. Middle businesses (50-250 employees) account for one-quarter (23.5%) of the supply industry, while large middle enterprises hold only 4.4%. About 10% of the businesses have more than 250 employees.

SUPPLIER TYPES

In order to be able to discover differences in internet usage along the value chain within the operational heterogeneity of the supply industry, we distinguish the suppliers according to the category "supplier type". For this purpose, the current general distinction between system supplier (first tier), components (second tier) and part manufacturers (third tier and following) is being enlarged by a fourth category, the „system integrator" or 0.5-tier enterprise (see Womack et al., 1994, p. 154; see also EIRO, 2000, p. 5; Pampel, 1993, p. 22; Lay/Wallmeier, 1999, p. 12). This category contains the market leaders, i.e. those multinational enterprises which posses key competences in the production and development of highly complex components, like complete front ends. System integrators are thus mainly large firms which work in research and development alliances with OEMs and realize most of their business value with OEMs.

Table 2 shows the structure of the supply industry by type. The parts or third-tier suppliers account for almost half of the businesses and, nevertheless, one-quarter of the employed. The second-tiers and third-tiers together comprise 93.6% of the businesses and employ, with 51.8%, more than half of the employees in the supply industry. The first tiers make up only 5.2% of cases, but hold a very large number of employees (43.4%). So it is obvious that at the top of the supplier hierarchy we mostly find larger enterprises while the SMEs are frequently located within the component and parts supplier categories.

Table 2.- *Distribution of enterprises by supplier type*

	number of enterprises...	...and employees
0,5-Tier	1.1%	4.7%
1st Tier	5.2%	43.4%
2nd Tier	44.4%	26.6%
3rd Tier	49.2%	25.2%
total	100.0%	100.0%
Source: own research; N=1,686		

WHICH EFFECTS DERIVE FROM EBUSINESS USAGE?

Inter-organizational level: The Impact of ebusiness on the Organisation of the Supplier Customer Relationships in the Automobile Supply Industry

This chapter focuses on the affect of eBusiness applications on the organisation of the automobile supply industry. The supply chain in automotive production is highly complex, and is characterized by a high level of modular production in the final stages. The supplied products are correspondingly heterogeneous: from simple parts like screws and springs at one end of the value chain to complex systems at the other. Both asset specificity and market complexity, especially the complexity of product descriptions, decrease from Tier 1 to Tier 3.

In this paper we propose that information technologies (IT) have contributed to the acceleration of structural changes in the automotive industry, which have been taking place since the 1990s. However, eBusiness is not the cause of this structural change, rather it allows companies to implement strategies that are necessary in the face of increasing modularisation. Insofar, this paper supports Holland and Lockett's thesis that, "[i]n essence, Information Systems enable organizations to do what they want to do more efficiently and flexible" (Holland & Lockett, 1994, p. 409). Yet the technical development of eBusiness has lead to a high degree of different applications, which affect the level of cooperation between firms or function as a market stimulus. In the automotive industry, we actually see an eBusiness boom in the purchasing and sales departments; the relatively new possibilities opened up by eProcurement are leading to a "move to the market" in particular segments of the automobile supply industry.

Before we try to explain how eBusiness applications are affecting the organization of the automobile supply industry, we would like to describe the highlights of the recent debate about the impact of IT technologies, which has relied heavily on arguments related to arguments of transaction costs theory.

Move to where? The Debate Surrounding the Impact of IT in the 1990s

The article "Electronic Markets and Electronic Hierarchies" (Malone, Yates, Benjamin, 1987) marks the beginning of the debate surrounding the impact of IT on forms of organization and coordination of business activities. In it the authors hypothesized that that IT technologies effect a "move to the market": they lead to an expansion of the coordination by market, to the detriment of internal, hierarchical coordination. Malone et al. assume that IT technologies increase the efficiency of both markets and hierarchies, because transaction costs are comprised largely of information and communication costs (Malone et al., 1987, p. 488). Due to the relatively strong reliance of the market on communications, network

technologies increase efficiency to a higher degree on markets than on hierarchies. The increasing opportunities for companies in the face of IT technologies, for example the exchange of complex product data together with decreasing costs, are effecting a move away from hierarchies and towards market transactions.

In 1994, Clemons and Reddi expanded on this hypothesis. They confirmed the conclusion that IT technologies decrease the advantages of vertical integration. Yet according to them, the predicted increase in outsourcing leads to a decrease in hybrid transactions between markets and hierarchies (hence their phrase "move to the middle"). The lowering of transaction costs through IT technologies reduces the advantages of pure market forms like spot markets, too. They assume "that since IT investments are idiosyncratic and their benefits involve a learning curve, long-term cooperative arrangements will be preferred to short-term market supplier arrangements so that firms can fully benefit from IT-Investments" (Clemons & Reddi, 1994, p. 857). As a result, information technology leads to the proliferation of long-term contracts and increasing cooperation between suppliers and producers.

Holland and Lockett (1994 & 1997), on the other hand, maintain that companies employ a particular mixture of market and hierarchical strategies (Holland & Lockett, 1997, p. 476). Like Malone et al., they assume that network technologies increase the efficiency of market and hierarchical transactions. However, they also note that companies use a particular mixture of electronic markets and hierarchies (hence their phrase "move to the mixed mode"). The various transaction forms depend on the complexity of the market and the level of asset specificity. Depending on whether both are low or high, there is a bias towards electronic markets or hierarchies, respectively.

The following sections (3.1.2 and 3.1.3) focus on the debate about the impact of network technologies. With the aid of quantitative data about the automobile supply industry, we will attempt to describe the consequences of eBusiness usage on the organization of the automotive branch. Additionally, this paper should contribute to the debate and improve the understanding of these impacts with respect to IT, for example by focusing on newer developments, especially the rapid technical progress and diversification of network technologies

Effects of different eBusiness applications

Since 1987, when the debate about the intra-organizational consequences began, information technologies have developed rapidly. This paper focuses on eBusiness as a part of IT, defined as internet-based applications between two or more companies. Alone in eBusiness, we see a high degree of diversification of internet applications. Nearly every function of a firm could be supplemented by browser-supported technologies, so that every department has got, with an e- as affix, its own internet counterpart, for example eProcurement, eLogistics, eEngineering etc.

In this chapter we propose that eBusiness applications affect to various degrees on the organization of transactions. These effects have been worked out by Malone et. al., who ascribes three effects to information technology (1997, p. 488):

- ✓ The *electronic communication effect* means that IT allows the exchange of information in lower amounts of time and cost.
- ✓ The *electronic brokerage effect* assumes that networked databases can assume the tasks of a broker to improve the matching between buyers and suppliers. Computer-supported systems allow an increase in the number of potential market

participants and the quality of decision between market alternatives while decreasing the costs of the selection process .

- ✓ The *electronic integration effect* occurs when companies define or standardize interfaces for information exchanges and processes, for example in the cooperative usage of CAD/CAM technology. When the same data or information may not entered in different systems, we find a reduction in time and an eliminated risk of errors in entering data.
- ✓ A simplified summary of these effects according to the functional categories of internet applications is shown in Table 3.
- ✓ Internet technologies in the production department (e.g. production planning systems), logistics (e.g. web-EDI) or in the research and development department (e.g. CAD/CAM) have their main impact in the electronic integration effect. Especially the conditions of modularisation and outsourcing stratgies of the OEMs have forced the spreading of these technologies in the automotive industry. "Just in time", zero error tolerance, or cooperations in development between two or more companies have been normal for a long time and, without IT, could not have been imagined to this extent.
- ✓ Compared to the upper eBusiness technologies, eProcurement systems aim at the electronic brokerage effect, too. Thus the central benefits of electronic RFQs or eBidding applications are increasing competition under suppliers as well as the quality of the procurers' decisions.

Contributing to the electronic brokerage effect does not mean that an application does not benefit at the electronic integration effect; the electronic integration effect and the electronic brokerage effect are not mutually exclusive . There are eProcurement applications, for example eBidding, which have only a small outcome attributable to electronic integration; on the other hand, there are internet technologies, like eRFQ, which achieve both the integration of data exchange and the brokerage effect. In this case, there is no logical contradiction between both effects.

Table 3. - *Strenght of IT effects of internet applications according to department*

effects	information	integration	brokerage
(a) Internet in purchasing department	high	low/high	high
(b) Internet in sales department	high	low/high	high
(c) Internet in production	high	high	low
(d) Internet in logistics	high	high	low
(e) Internet in research and development	high	high	low

Usage of eBusiness applications in the Automobile Supply Industry by Quantitative Data

We actually see a boom in internet applications in the spheres of (a) and (b) as seen in Table 3. In the discussion about eBusiness, eProcurement systems that are installed in

purchase departments are valid as a pace maker, and recent empirical studies show immensely accelerating rates for eProcurement systems. According to empirica study, the proportion of German companies, that use internet applications in their purchase departments, doubled over a period of two years: the proportion increased from 26% in 1999 to 49% in 2001 (empirica, 2001, p. 7). Our quantitative data on the automobile supply industry also confirms the function of eProcurement as pace maker in eBusiness (see Table 4). We asked suppliers, which departments they use specific eBusiness applications. Our data show only those eBusiness usages which include more complex applications than just email and surfing the internet. Independent of the supplier type, more than half of the companies use such internet applications in the purchasing department. Therefore, eProcurement usage was more extensive than eBusiness usage (in a primary integrative way) in production, logistics or research and development.

Table 4. - *Distribution of eBusiness applications according to department*

	1st Tier	2nd Tier	3rd Tier
(a) Internet in purchasing department	57.1	55.7	58.4
(b) Internet in sales department	58.4	48.9	51.8
(c) Internet in production	18.2	14.3	10.6
(d) Internet in logistics	49.4	36.7	34.1
(e) Internet in research and development	37.7	19.5	15.0
Source: own research, N=1,573			

Move to „Mixed Mode“ by Internet Usage

How do these results influence inter-organizational change in the supply industry? When we take a look at “integrative” internet applications (letters (c) to (e) in Table 4), we see that the intensity of usage decreases in accordance with a decreasing position in the supply chain. This data is in accordance with the complexity of the supply chain in the automotive industry: in the automobile supply chain, the “market complexity” (as defined by Holland & Lockett, 1997, p. 477) declines from the first-tier to the third- or fourth-tier supplier. Under conditions of modularity we find a higher complexity of product attributes in the system supply sector, as compared to the parts supply sector. The degree of asset specificity follows the same distribution along the supply chain. Table 4 shows that an IT-based “move to the middle” has taken place. This “move” decreases along the supply chain, in other words with decreasing market complexity and asset specificity.

In chapter 3.1.2 we determined that eProcurement systems mainly produce the electronic brokerage effect, which does not necessarily mean that they do not produce the electronic integration effect as well. Our survey confirmed the coexistence of seemingly contradictory effects, and the question of what goals businesses hope to achieve with the introduction of eProcurement applications served as an empirical indicator. Table 5 shows that, aside from the goal of improving internal processes (a), both the competition-related

goals of increased competition (letters (b) and (c)) and the integrative goals were equally important.[4]

Table 5. - *Goals of eProcurement applications*

	strongly agree	agree	sum of I & II
	I	II	III
(a) process optimisation	31.4	42.4	**73.8**
(b) discover the new suppliers	30.3	39.1	**69.4**
(c) decrease product costs	31.2	37	**68.2**
(d) adoption of supplier standards	31.3	36.4	**67.7**
(e) customer coersion	23	36.9	**59.9**
(f) decrease personnel costs	19.9	25.6	**45.5**
Source: own research, N=542			

The results show, that even in the case of eProcurement systems there is no simple "move to the market" as defined by Malone et al. Rather, the results support Holland and Lockett's "mixed mode" hypothesis. The qualitative data from our case studies show, a producer's introduction of eProcurement systems requires a certain level of investment on the part of suppliers. However, mainly the producer enjoys the benefits gained from the integration effect. With increasing market complexity, the supplier's investments lead more and more to hybrid organization forms. For a supplier engaged in spot markets, investment in the integration effect is associated with sunk costs.

A "move to the middle" as defined by Clemons and Reddi is equally improbable, thanks to the brokerage effect. No doubt, eProcurement systems improve the quality of the procurement process. They do this by allowing more information to be processed simultaneously. As a result of eProcurement, the market increases when contracts expire and are renegotiated.

For the supply industry, eBusiness leads to various changes in the supply chain. In part production sector, under conditions of lower market complexity and asset specificity, a "move to the market" takes place. At the other end, in the first-tier supply sector, our study supports Holland and Lockett's "mixed mode" approach.

The mode of ebusiness implementation: the intra-organizational level

In this chapter we will examine how enterprises implement eBusiness-tools. First, a broad distinction is to be made between those enterprises which initiate eBusiness on a "voluntary" basis and those firms which are being "forced" to participate in the eBusiness business (see Hertwig, Mühge, Tackenberg, 2002). This distinction is important for several

[4] The companies were asked to give an answer on a scale from 1 to 4, where 1 meant "strongly agree" and 4 "strongly disagree". Table 5 shows the percentage of answers marked 1 and 2, as well as the sum of these percentages.

reasons: While the first group of firms is able to decide rationally *which eBusiness applications* should be implemented and for *which reasons* and functionalities, the second is in a position where they are being confronted with a strong demand by their customers to use those eBusiness tools the customers prescribe. However, this distinction only underlines that the usage of eBusiness cannot *ex ante* be defined to be voluntary. It is not always up to the firm whether to participate in the eBusiness business or not. In the real world, however, we find a high percentage of firms which are both active drivers in the eBusiness and passive users of applications prescribed by customers. This fact is due to the structure of the industry: small parts suppliers as well as first tiers are being confronted with eBusiness tools of OEMs or other customers. But while first-tiers are backed by a high amount of necessary resources, SMEs are not sufficiently appointed for that task. Due to SME's specification we find a lack of resources, especially concerning finance, "human resources" and relevant know-how.

To prove this hypothesis which was derived from qualitative interviews with firms executives, we – operationally – focused on the following questions: To which degree is the implementation process is conducted on a rational basis as opposed to unstructured and unplanned implementation of an eBusiness application or tool. Two criteria which serve as an index are: (1) Whether or not there is a budgetary and project plan for eBusiness implementation and (2) whether or not a responsible executive in charge of the project.

Let's have a look at the results from our quantitative examination.

Budget and time schedule

As an indicator for a planned implementation of eBusiness, we asked the firms whether a schedule concerning the foreseen costs and the anticipated duration of the project is being developed in the forefield of the implementation process.

	0.5 Tier	1st Tier	2nd Tier	3rd Tier
strongly agree	62.50	45.76	19.31	15.65
agree	18.75	23.73	25.75	27.66
disagree	18.75	16.95	26.67	29.71
strongly disagree	0.00	13.56	28.28	26.98
Source: own research; N=951				

Table 6: Response to the statement: "There is always a schedule concerning budget and time" (by supplier type, in %)

The data reveals considerable and substantial differences between the different supplier types. We obviously find a decrease of rationality the further we look down the supply chain, or, to put it in other words: the higher the supplier status of a firm, the more structured its dealing with eBusiness will be.

An even stronger conclusion can be drawn from the inquiry when we replace the supplier types by size category, as can be viewed in Table 7. The underlying data unquestionably supports the thesis that the smaller an enterprise is the more it suffers from a lag in structure and planning concerning its dealing with eBusiness. However, as we explained in chapter 2, size in terms of "number of employees" is strongly correlated with the supplier type-index. So these results, one may say, have to be expected. What appears interesting in this case (and may be subject to further examination) is that size seems to be a

more important feature, while the other criteria of the "supplier type" index somehow seem to level the results.

Table 7: *Response to the statement: "There is always a schedule concerning budget and time" (by employee size category, in %)*

	Less than 10	10 to 49	50 to 249	250 to 499	500 to 999	More than 1,000
strongly agree	9.26	10.87	23.81	38.18	37.93	70.45
agree	18.52	24.92	30.16	32.73	37.93	18.18
disagree	33.33	29.77	25.00	23.64	20.69	9.09
strongly disagree	38.89	34.45	21.03	5.45	3.45	2.27
Source: own research; N=1,032						

Within the category of 0.5 system integrators and the first tiers the development of a project schedule is natural. About three quarters of the enterprises (81% of the 0.5s and 70% of the first tiers) regard themselves as firms who have a clear notion of what to do and why to act in this way. The implementation is viewed as highly planned and structured, so none of the 0.5 tiers and only 14% of the first tiers deny having a clear schedule when dealing with eBusiness systems.[5] We can assume these 14% are those firms which do not yet have their own eBusiness applications, but are forced to work with tools implemented by customers. However, even while dealing with strange applications, work still seems to be relatively rational in terms of planning.

A totally different result is to be found within the second and third-tier suppliers (see Table 4). More than half of the enterprises (second tier: 54.95%, third tier: 56.69 %) do usually not develop a schedule for eBusiness-implementation. Only 16% of the third tier-firms admit to always setting up budgeting and time schedules. The "lower" supplier enterprises more often act without a schedule and in an unstructured way.

Executive in charge

The second point of interest is the existence of a "man/woman in charge" of the eBusiness-implementation project: Is there someone – one or more executives, a person or a team – who is regarded as responsible for the project, i.e. the maintaining of the defined budget, the time schedule etc.? This point seems very important because – whether or not you have certain schedules – it seems necessary to have a project manager, or at least a person whose task it is to coordinate and control all the other tasks defined and fulfilled by other actors, i.e. other employees, customers, application service providers (asp) and so on.

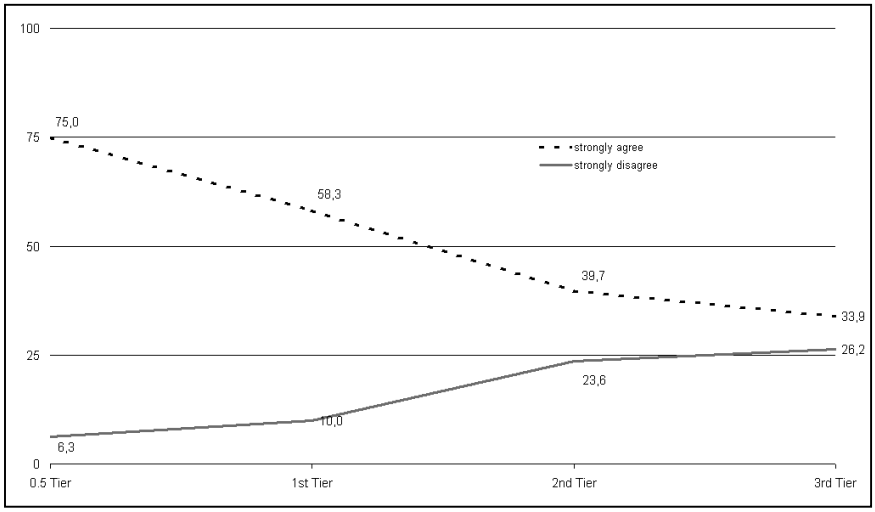
[5] 75% of the first-tiers voting "strongly disagree" have less than 250 employees.

Table 8: *Response to the statement: "There is always an accountable project manager" (by supplier type, in %)*

	0,5 Tier	1st Tier	2nd Tier	3rd Tier
strongly agree	75.00	58.33	39.68	33.94
agree	12.50	25.00	25.00	23.30
disagree	6.25	6.67	11.70	16.52
strongly disagree	6.25	10.00	23.62	26.24
Source: own research; N=954				

The results shown in Table 3 reveal, though on an overall higher level, the same picture. 88% of the first tiers and 83% of the second tiers always shift the responsibility to a dedicated person who is in charge of the project roll out. Although within 65% of the second and 57% of the third tiers we still find a higher number of firms who work in a structured way, it cannot be denied that there is a decrease in responsibility as we move down the supplier hierarchy. An equivalent picture was revealed in terms of timing and budgeting. At the same time, we find an increasing number of enterprises lower on the supply chain who obviously do not have a responsible person at all dealing with eBusiness.

Figure 1: *Response to the statement "There is always an accountable project manager" (by supplier type, in %, answers "strongly agree"(green line) and "strongly disagree" (red line).*



The results drawn from the empirical data can thus be summarized with the following

When we follow the supply chain, from the first tier system integrator down to the SME-structured third tier parts supplier, we find that the way eBusiness is implemented or being dealt with becomes more unstructured, unplanned and thus more and more irrational: The green line ("strongly agree") marks a permanent decline, with the red line only showing the counterpart.

So we find that many SMEs do not really *implement* eBusiness, they rather more *react* to what customers prescribe. “Implementation” in that sense at least requires the slight existence of a notion: *what* have I got to do, *why*, for which purpose, and *how* can I fulfil the task? To repeat what was stated above, it is primarily a lack of financial, personnel, know-how and time resources which makes it impossible for SMEs to participate in the eBusiness business actively. Even though in daily life blueprints often turn out to be not more than just a matter of legitimacy, the number of firms who admit to having no plan of what they do is astonishing.

CONCLUSIONS

We can summarize what we have examined so far:

In contrast to the „traditional“ technologies like EDI or PPS systems, eBusiness focuses on optimizing the vast field of business administration, i.e. purchasing, sourcing, logistics administration or sales. Production remains a main area of rationalization, but enterprises have already installed certain advanced technologies (in the past and present) that are not being substituted by eBusiness tools. One reason may be that „traditional“ technologies still perform better concerning automatization than eBusiness tools can do. Another point is what we call the risk of the new technology: internet-based systems are still new and show a certain amount of weakness. Thus, when key elements of production are based on this technology, a high degree of risk is involved. Enterprises are better off testing the new technology in low-risk areas.

In chapter 3.1 we determined that eBusiness applications support different management strategies. eBusiness systems mainly lead to a “mixed mode” in the organization of the supply chain, as defined by Holland and Lockett. If we take a look at eBusiness in various departments over the past decade, we see that all technologies are not equally developed. eBusiness accelerates structural change in the value chain of automobiles, but the speed of change also depends on the technical (and organizational) state of development of internet applications. For example, EDI has, since its introduction in the 1970s, contributed to the emergence of hybrid organizational forms. Though eProcurement, with such applications as catalog systems, eRFI, eRFQ and reverse auctions, has only recently become possible, it has been incorporated quickly into most purchasing departments.

Whether eProcurement leads to hybrid or market transactions cannot be determined. The quality of structural change is largely determined by market complexity and asset specificity. At the base of the supplier pyramid, where the production of simple and standardized parts takes place, eBusiness leads to a “move to the market.” At the top, under conditions of high market complexity and asset specificity, the impact of eBusiness is unclear. The simultaneous existence of the brokerage and information effects makes eBusiness seem to function in a paradoxical manner: while the brokerage effect stimulates competition, the integration effect promotes the development of hybrid structures and long-term contracts.

On the intra-organizational level, concerning the implementation of eBusiness systems, we found that in small and medium enterprises (SME) the implementation of eBusiness seems less planned and structured as compared to larger (0.5 or system) suppliers. The introduction of eBusiness applications confronts these firms with enormous challenges regarding their financial and personnel resources, as well as technical know-how. As eBusiness utilization is primarily initiated by OEMs and first tiers, we hold that module and parts suppliers are often forced to use eBusiness. This results mainly from certain structures of power in the supplier hierarchy.

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