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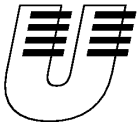
**Institut für  
Wirtschaftsinformatik**

Fachbereich Informatik  
Universität Koblenz-Landau

CAROLA LANGE

**DEVELOPING STRATEGIES FOR  
ELECTRONIC COMMERCE IN  
SMALL AND MEDIUM SIZED  
COMPANIES  
GUIDELINES FOR MANAGERS**

Oktober 2003



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## **Abstract**

The wide spread of the Internet has caused an extensive structural change in many industry sectors. This is due to new opportunities for direct communication with consumers through the Internet. Another important reason is the dramatic reduction of costs of searching for and communicating with business partners. This paper was written in the context of the ECOMOD project, which aims at developing a method for designing powerful and flexible infrastructures for electronic commerce, particularly from the viewpoint of small and medium sized enterprises (SMEs). With this background new options provided by the Internet on the strategic level are examined. We investigate chances and risks connected to the different ways of Internet usage. Main issues concerning the strategic use of the Internet are introduced using a decision tree and then discussed in further detail. Afterwards fundamental market and company characteristics are analysed, which indicated the appropriateness of applying the various Internet strategies.

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# 1. Introduction

## Structural Change

Starting with the usage of information technology in businesses two decades ago, a general structural change – of traditional competitive structures and value chains – could be observed in many industries (see e. g. [PoMi84]). Information about future changes in demand, value chain partners, and competitors has become a critical factor. The ability to offer flexible and individualised services to the customers on the basis of this information has become crucial to achieve competitive advantage ([Alte02] S. 8).

**New Value Chains**

**Information as competitive advantage**

The more and more increasing penetration and usage of the Internet accelerates this structural change (see [Alte02] S. 8). The high availability of the Internet allows information about prices and products to be widely accessible without any geographic or timely constraints. This, however, tends to lead to highly transparent markets, which – in conjunction with globalisation and deregulation – tightens competition even further.

**The Internet as accelerator of structural change**

## Competitive advantage through ICT

Since its early days information and communication technologies (ICT) were considered as enablers for competitive advantage (see e. g. [PoMi85], [JoVi88], [LMS97]). At the same time, however, it has been pointed out, that information technologies can cause the risk of structural change inside an industry sector. „A company’s search for competitive advantage through information technology often also spreads to affect industry structure as competitors imitate the leaders strategic innovations“ ([PoMi85] S. 155).

**ICT as enabler of competitive advantage ...**

**... and as potential risk**

Nowadays, ICT and the Internet not only represent the chance to diminish costs and rationalize processes. In some industries the usage of information technologies has become necessary in order to keep up with competitors, to fulfil the high expectations of customers, or to provide

**Internet usage as necessity**



the technical infrastructure demanded by major customers (see e. g. [Obere03]).

## SMEs and the Internet

Special consideration should be given to small and medium enterprises (SMEs), because they conduct business with prerequisites very different from larger corporations, which is frequently due to very limited resources. Therefore, SMEs usually have to apply different competitive strategies („*A small business is not a little big business*“ [WeWi81]).

**Limited resources**

In practice, SMEs – with limited financial resources and narrow geographic market boundaries – usually do not attach much significance to strategic planning (see [Pfoh97] S. 19, [FFH03] S. 9). However, the structural change described above challenges SMEs in particular. The more and more globalized markets and faster technological developments increase the importance of proactively controlling the strategic position and competitive developments in the market (see e. g. [FFH03]).

**Higher competition in globalized markets**

**Necessity to control competition**

### Objectives:

- Comprehensive description of strategic options for SMEs on the Internet.
- Structured assessment of each strategic option.
- Guidelines for the configuration of an Internet business strategy.

SMEs have to deal with new risks in more transparent markets. But the Internet also offers new opportunities for smaller enterprises through innovative ways of dealing with higher competition in transparent markets (see [Alte02] S. 10 f). Considering special requirements of SMEs, the following sections discuss strategic options, which emerge when

using the Internet as a channel to communicate and interact with customers and suppliers. A decision tree is suggested structuring fundamental questions regarding the strategic use of the Internet. Possible answers are then described pragmatically from the view points of SMEs.

## **The research project ECOMOD**

This research has been conducted in the context of the ECOMOD (E-Commerce MODeling) project, which is funded by the German Research Foundation (Deutsche Forschungsgemeinschaft). ECOMOD aims at supporting particularly SMEs in better dealing with the challenges of structural changes. A method for the design and maintenance of powerful and flexible infrastructures in E-Commerce is being developed. To this end, generic processes, modelling languages, and reference models are constructed, which highly reduce the effort needed to develop powerful and flexible infrastructures for conducting business electronically. Economic theories as well as issues regarding technology and software development are considered in this project. So, in this paper traditional strategy concepts as well as the special requirements of conducting business over the Internet are taken into account.

## **Content**

The rest of this paper is structured as follows. Section 2 discusses specific strategic options for using the Internet. Section 3 gives a few guidelines for choosing the right strategy and appropriate combination of strategies. The paper concludes with some remarks on further steps necessary in order to put the suggested strategic options into practice (section 4).

Before getting into details concerning the different opportunities, the decision tree is briefly described in the following subsection (1.1). Afterwards, the criteria relevant to assess each strategic option are introduced (section 1.2)

## 1.1. Decision Tree

The decision tree depicted in Figure 1 (p. 6) lists idealized strategies for E-Commerce. The question for the primary objective pursued by using the Internet in a company serves as starting point.

### Starting point:

“What is the primary objective you want to pursue by using the Internet for your business?”

To this end, four relevant answers have been identified:

#### A) Expanding the market

The opportunity to reach a geographically wider market is one of the strategic chances through the Internet most frequently mentioned (see e. g. [Venk00], [JCB01]). Apart from the geographic expansion, the Internet allows the extension along the value chain (vertical integration). Here, the vertical forward integration, in particular, should be mentioned (it involves incorporating additional value creating activities in the direction of the end-customer), because the Internet allows direct contact with the customer with minimal additional costs. Furthermore, markets can be expanded by selling new (digital) products and services directly over the Internet.

**Geographic Expansion**

**Vertical Integration**

**New products and services**

#### B) Improving the current market position

Competitive advantage of SMEs are usually not related to prices but to customer services, product quality, as well as reliability, intensive customer care and close customer relationships (see e.g. [EU02] p. 8, [Schu03] p. 749). So, the new opportunities on the Internet regarding better differentiation from competitors (e. g. through more services) are vital from the view point of SMEs. The Internet also allows cheaply individualising customer relationships and in this way better retaining

**Differentiation**

**Customer retention**

customers and fully exhausting customer potential.

### **C) Cost reductions**

Another frequently mentioned strategic chance is the opportunity to reduce costs by conducting business over the Internet (see e. g. [Venk00], [JCB01]). However, it is not only transaction costs that can be reduced, but also new ways of pricing are enabled through the Internet. For example, SMEs are now able to bundle their demand and in this way increase their bargaining power over suppliers and lower prices ([Alte02] p. 11, see also [Arno97] p. 128 ff).

**Transaction costs**

**Demand bundling**

### **D) Focussing on the core business**

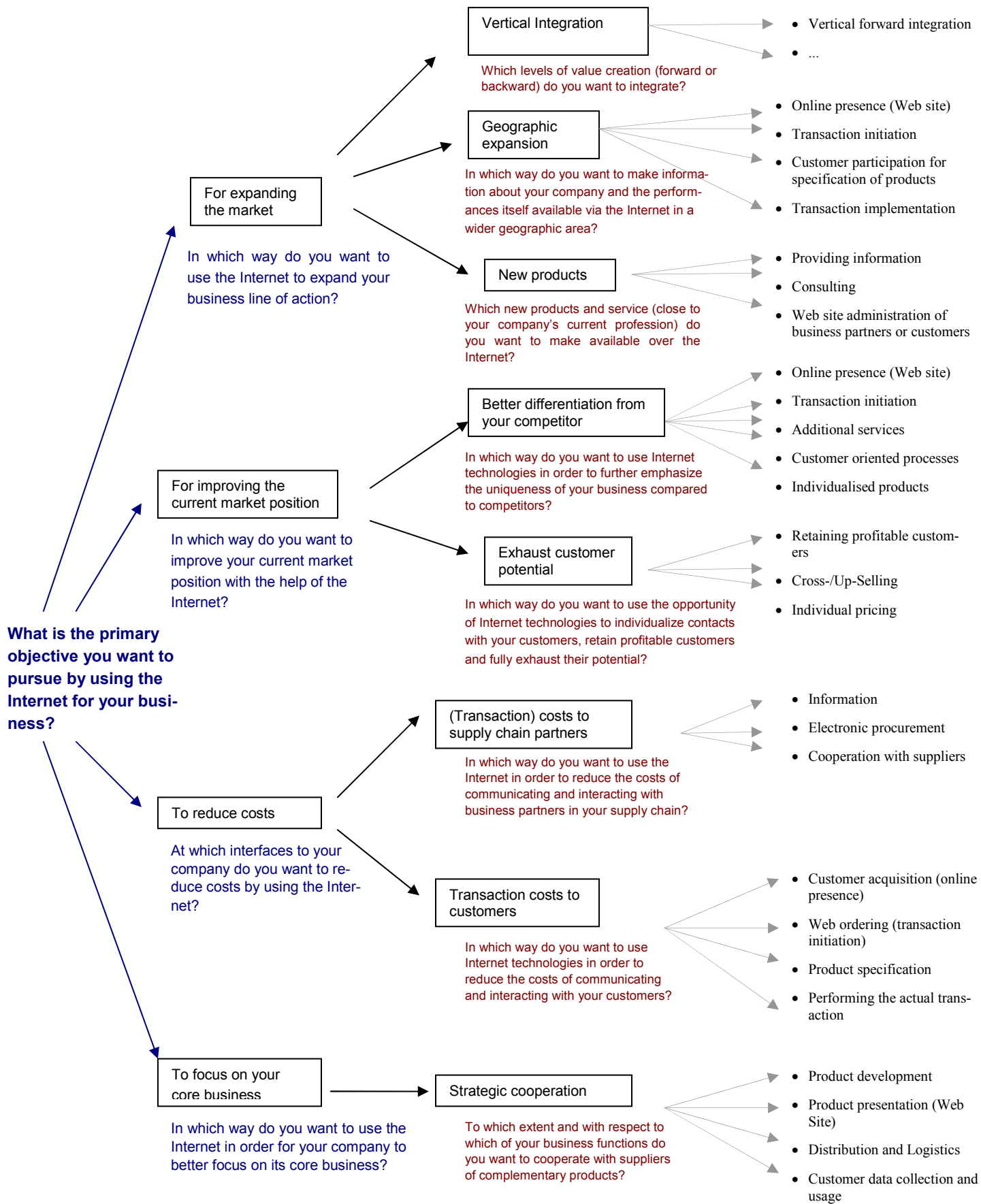
The Internet supports companies to focus and further specialize on their core business; Internet technologies can be used to economically cooperate with companies supplying other, complementary products. For example, smaller enterprises can offer product packages together with other business partners through electronic market places ([Alte02] p. 11, [Pfoh97b] p. 172 ff).

**Cooperation**

The leaves of the decision tree represent the different strategic options. Options of the same parent node frequently correspond to evolutionary stages, for which one level can only be achieved if all (or some) of the requirements of the previous level have been fulfilled.<sup>1</sup> For each individual case the different strategies should be combined to a strategy mix with respect to the specific aims of the company and avoiding possible conflicts (see section 3).

---

<sup>1</sup> For a description of the fundamental evolutionary stages in ECOMOD see [LaFr03].



**Figure 1: Decision tree of strategic options on the Internet**

## 1.2. Assessment criteria

Three fundamental criteria will be considered in order to assess the appropriateness of a strategic option for using the Internet: necessary investments, chances and risks of applying this option and basic critical success factors.

### Necessary investments

The investments necessary in E-Commerce to a large extent depend on the required technical infrastructure, for example Web-servers, software and security mechanisms. Even higher initial expenditures are frequently necessary for the adaptation of business processes, which usually requires extensive process analysis, new process design, and implementation in order to better coordinate and optimize relevant business processes. Usually it is also necessary to build new organizational units, define new areas of responsibility and incorporate them in the current organisational structure.

**Technical infrastructure**

**Business process adaptation**

The investments can be differentiated into expenditures for analysis, design, and implementation. Existing reference models and generic processes (independent of a particular business case) can support the actions necessary in the different phases. When discussing each strategic option brief hints are given to indicate which (generic) models can help implementing that option.

### Chances and risks

Three relevant aspects can be distinguished when looking at the chances and risks that arise when using the Internet. Some chances (and risks) arise largely independent from the respective company and the industry structure. For example, a chance could be to reduce costs and acquire more customers and a general risk could be to depend on business partners or technologies and standards. Other chances (and risks) are connected to certain characteristics of a company. For example, professional and technical competences can be a chance, a lack of motivation and flexibility can impose a risk on implementing new processes and structures. A third type of chances (and risks) is dependent on or refers to factors in the environment, market or industry sector char-

**General**

**Company specific**

**Industry sector specific**

acteristics. For example, raising market entry barriers can be a chance and the threat of new substitute products can be a risk.

### **Critical success factors**

The following remarks also consider fundamental requirements for a successful implementation. The critical success factors represent central challenges that have to be considered for successfully implementing the respective strategic option. When appropriate, essential competences are also discussed briefly.

## **2. Strategic options**

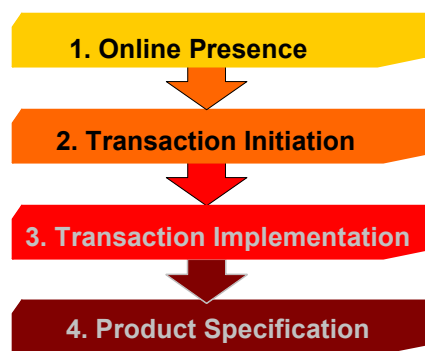
The decision tree as depicted in Figure 1 serves as a guideline to identify basic strategic options. Since many of the 'leaves' in the tree are overlapping the following descriptions of the different strategic options are not structured according to the decision tree but according to main subjects.

First, we have a look at the fundamental evolutionary stages for communicating and interacting with the customer via the Internet. Afterwards the different ways for cooperating over the Internet are presented. Then we will investigate the different opportunities for electronic procurement. The last two subsections discuss further options to expand the market and new opportunities for better customer orientation on the Internet.



## 2.1. Fundamental evolutionary stages (*downstream*)

The decision tree shows four evolutionary stages given as strategic options for three different objectives: geographic expansion, better differentiation from your competitors and cost reduction. Figure 2 depicts these fundamental stages of using the Internet for communicating and interacting with the customer.



**Figure 2: Four fundamental evolutionary stages towards the customer.**

The stages will be presented and discussed in depth in the following subsections. Basically, the first stage comprises using the Internet as an additional ‘shop window’ to your company. In the second stage not only the company itself but also its products and prices are presented on the Internet. This stage evolves to the third level if customer can actually place orders over the Internet. The fourth level comprises not only online ordering but also the possibility for customers to specify their individual products by themselves. Note, that the first two stages are constitutive to achieve the third and fourth stage. The main difference between the last and the first two stages is that a contract is being made which involves the necessity to implement more complex processes and security mechanisms.

### 2.1.1. Online presence

An online presence is usually developed in order to represent the company on an independent Web site. In many cases the design, implementation and maintenance of the Web pages is outsourced, because there are only very few interfaces with business specific functions.

Useful: Reference models to structure typical Web site content.

### Necessary investments

There are only relatively few investments necessary for technical infrastructure, such as Web Servers and Software for developing and administering the Web sites. Additionally, the general business contact information should be augmented by the Web site' URL and E-mail address.

**Web-Server**

**Web site design**

### Chances

Basically, the mere online presence represents just another 'shop window' of the company. This can lead to a better reputation for two reasons: first, because of having an online presence and therefore showing that your company is using the Internet, second, because of specific content on the Web site that promotes, for example, particular reference projects and customers. An independent Web presence can also help to further differentiate your company from competitors by showing your specific skills and experience. A Web site also allows acquiring customers in a wider geographic area.

**'Shop window'**

**Differentiation**

**Geographic expansion**

### Risks

Obstacles can arise if you try to acquire customers in a wider geographic region and the administration of the online presence has been outsourced. Because, in this case, data of potential customers is usually more difficult to collect and Web site functionality (in order to reach further evolutionary stages) can hardly be extended. Since an online presence is very easy to imitate by competitors, a Web site itself can rarely be maintained as competitive advantage. So, in order to achieve

**Easy to imitate**

the goal of better differentiation from competitors further measures are necessary. The Internet is a very cheap marketing media. However, it does not necessarily lead to higher sales, since – on this stage – product and price information is not presented. Hence, it is likely that further actions are necessary in order to achieve cost reduction.

**No direct cost reductions**

## **Critical success factors**

A vital factor for the success of an online presence is the correctness and timeliness of the presented information. This can better be achieved by initially designing and implementing an administration process.

**Timeliness**

The Internet should not be used as just another channel to promote and publish existing brochures. But it should be used taking advantage of the medium specific characteristics, which are, for example, hyper links and intuitive user oriented navigation. It is also important to place relevant keywords on your Web site and register your site at prominent search engines.

**Take advantage of medium specific characteristics**

E-mails are a fundamental new way for asynchronous communication, that has been opened through the wide spread of the Internet. In order to allow your potential customers a seamless way of communication, a specific E-mail address should be placed on your Web site. Furthermore, a process for examining messages coming in over this channel has to be established.

**Use E-mail**

## **Necessary competences**

Crucial competences for implementing this strategic option are Web site design and administration as well as Web-Server administration (if operated internally and not outsourced).

### 2.1.2. Transaction initiation

An Internet presence is necessary prerequisite for supporting transaction initiation over the Web. Apart from general information about the respective company this evolutionary stage involves providing product and possibly price descriptions, for example in the form of electronic product catalogues.

**Online presence + product information**

Useful: Reference models for categorising and describing products.

### Necessary investments

The product and price data should be provided using a standardized catalogue format. This might require costly evaluations before the decision can be made and subsequently reformatting the existing product descriptions according to the chosen standard. After a standard has been chosen and a procedure has been implemented to map the internal product data to the respective catalogue format, the maintenance of the corresponding Web pages usually does not require much effort.

**Standards for product descriptions**

**Reformatting the data**

### Chances

The aim of geographically extending the market can now be achieved more effectively, because any interested customer with access to the Web site can get sufficient product information to place an order via the traditional channels. Furthermore, providing structured product information in a standardized format is a fundamental basis for further ways of differentiation over the Internet for more sustained competitive advantages. Costs for customer interaction and communication can be reduced, since the customer himself can now access all the necessary data and the Internet imposes (virtually) no limit on the number of concurrent site calls.

**Product information globally available**

**Basis for further differentiation**

**Cost reductions for customer interaction**

### Risks

In general, providing product and price information on the Internet implies – from the supplier’s viewpoint – the risk of increased market transparency and decreased switching costs for customers: the competi-

**More transparent markets**

**Increased price**

tor is 'just a click away'. And more transparent markets tend to increase price competition (see e. g. [BHK02] S. 35). As with the sheer online presence, providing product information over the Web does not guarantee a sustained criterion for differentiation. This is because of the Internet being an open technology, so that it can relatively easy be used by any competitor to provide their customers with product information, too.

**competition**

**No sustained competitive advantage**

## **Critical success factors**

In order to provide the customers with a reliable source of information, it is necessary to continually update the product catalogue and product descriptions. This requires appropriately integrating the catalogues and Web applications with the existing business information systems.

**Timely updates**

In order to foster the usage of your product catalogue data by (prospective) customers, an appropriate open standard for formatting the product catalogue has to be chosen.

**Standards**

To encourage the customers to access the product information provided on the Web by themselves, customer requests coming in from all the different channels should be reacted to and answered quickly.

**Quick consumer response**

## **Necessary competences**

It is necessary to know the relevant criteria to assess current standardisation initiatives. It is also helpful to know how to model products and product catalogues on the appropriate level of abstraction.

### 2.1.3. Transaction implementation

The consecutive evolutionary stage involves not only providing product information but offering ways for purchasing products using Internet technology. This is generally implemented by providing interfaces for placing orders over the Web.

**Online presence,  
product catalogues,  
and Web orders**

At this stage the Web site's purpose is not only to allow the access to information but to provide a wider variety of functionality: customer data needs to be managed, order forms and security mechanisms have to be implemented, and in many cases means for electronic payment have to be provided, too. Inside the company incoming orders have to be processed and integrated in existing business processes.<sup>1</sup>

Useful: Reference models and general processes for consumer transactions and pricing mechanisms.

#### Necessary investments

For implementing this evolutionary stage, investments are necessary not only for improving the technical infrastructure but also for adapting the incoming order processes. The technical infrastructure needs to be extended by a customer database and authentication mechanisms. In order to interact with the customer over the Web security mechanisms for placing orders and electronic payment have to be implemented, too. For adapting the order processes current business processes need to be analysed and redesigned. If multiple channels for communication with the customer are maintained, it has to be taken into account that orders and contacts coming in from different channels need to be coordinated.

**Customer database,  
authentication,  
security**

**Business process  
redesign**

**Multi-channel coord-  
ination**

#### Chances

Costs can be reduced considerably, if the incoming order process is fully automated over the Internet. The savings are due to decreased transaction costs and the unlimited temporal and geographic availabil-

**Cost savings**

**Global reach**

---

<sup>1</sup> Additional aspects need to be considered when looking at digital products.

ity of the system. Hence, the objective of extending the geographic reach can fully be achieved (given that there are no logistic related constraints).

## Risks

It should not be underestimated, that there is always the danger of increased costs, if more than one channel of communication has to be maintained. If customers still want to be able to contact you through traditional channels, parallel order processes need to be kept up, which tends to be more costly than having just one channel for customer interaction (see [BHK02] p. 35).

**Additional costs for parallel processes**

## Critical success factors

The Internet application has to be sufficient powerful and robust. It has to provide appropriate security mechanisms to ensure the transactions to be secure (see e. g. [ZPS+00] p. 241).

**Powerful Web applications**

Different channels for communicating and interacting with the customers need to be coordinated. Customer and transaction data should be available for staff working on all the different channels in order to avoid contradicting behaviour towards the customers and to take advantage of the specific characteristics of each way of interaction.

**Coordinating all different channels**

Standards should be used for the product catalogues (as described above) but also for implementing the security mechanisms. This is necessary for, on the one hand, supporting further integration on the customer's side and, on the other hand, to make the application appear more trustworthy and attractive for new and (Web-) inexperienced customers.

**Standard interfaces**

Another critical factor is the integration of the new Web applications and databases with existing business information systems. An integrated process control (as provide for example by Workflow Management Systems) is necessary in order to ensure the integrity of the product data provided over the Web but also to ensure business processes to be efficient.

**System integration**

Appropriate measures and processes have to be implemented in order to enforce claims for outstanding payments, because with the use of the Internet new ways of misusing means of payment and illegal breach of contract have emerged.

**Claim enforcement**

Attained cost savings can be used to reduce prices with the aim of steering the customers toward cheaper communication channels. For example, many banks have reduced prices for performing transactions over the Internet as opposed to transactions performed by a clerk in a branch location; or they might give favourable terms for accounts run only over the Internet. However, if a channel oriented pricing strategy is pursued, it has to be examined, if reduced prices are also comprehensible for traditional customers using the traditional channels (for example mail-order).

**Comprehensible prices**

## **Necessary competences**

Special aspects of contract law on the Internet, process analysis and aspects of channel coordination, as well as knowledge on data mining techniques are fundamental for implementing this strategic option.



## 2.1.4. Product specification

The Internet allows customers to participate in specifying the requirements of services or the configuration of products with relatively few additional costs. It has to be ensured that the specification is integrated in the production process. Apart from the aspects of transaction initiation and implementation, a customer guiding specification process has to be implemented, which automatically validates the specification.

Useful: Generic or industry sector specific reference models for products and product specifications.

### Necessary investments

In order to allow the customers themselves to specify the requirements for their products, first a model has to be developed which describes and structures the different possibilities for product specifications. On this basis a Web-based specification tool has to be implemented. Furthermore, planning and production processes have to be adapted in order to appropriately integrate the product specifications.

**Specification model and tool**

**Process integration**

### Chances

By allowing individual product configurations the aim of further differentiation can be achieved through individualised products. At the same time the threat of substitute products as well as market transparency can be decreased. Additionally, because the customer performs some activities himself, transaction specific costs can be reduced significantly.

**Product differentiation**

**Reduced transaction costs**

### Risks

Employees might object to the idea of customers performing former business functions, if their area is affected by necessary changes in processes or tasks. Additionally, it should be considered that production cost structures might increase, since unit numbers usually decrease if more configuration parameters are offered.

**Employee objections**

**Increased production costs**

## Critical success factors

It makes sense to encourage customer participation for specifying products only if the specification can be appropriately represented and supported by Internet technology. Hence the requirement specification needs to be 'formalisable' to a certain extent.

**Formal specification**

Another critical success factor for this strategic option is to find the appropriate abstractions and concepts for an integrated model (i. e. structured description) of the product characteristics and specification options.

**Appropriate modelling**

## Necessary competences

Knowledge and experience in data and process modelling is fundamental for successfully implementing this option.

## **2.2. Cooperation**

Throughout the value chain cooperation is an important approach to achieve scale effects and to better focus on the core business. The Internet supports new economic ways of cooperation with value chain partners, suppliers of complementary products, and even your own competitor (see e. g. [ZPS+00] p. 182).

### 2.2.1. Cooperation to bundle demand

The wide spreading of the Internet allows multiple – usually geographically remote – suppliers to bundle their demand through new intermediaries. This opens up new opportunities, in particular, for small and medium sized enterprises to take advantage of procurement prices comparable to conditions of their larger competitors, which they would not be able to take advantage of by themselves.

Useful: General process models for analyzing and centralizing procurement processes.

#### Necessary investments

A prerequisite for bundling your company's demand is selecting an appropriate intermediary and – if necessary – adapting the procurement data formats accordingly. In order to fully take advantage of the benefits the internal procurement processes should also be adapted; in particular for indirect goods (MRO goods: Maintenance, Repair, Operations) it might be necessary to centralise current processes.

**Reformatting procurement data**

**Centralizing and adapting procurement processes**

#### Chances

The fundamental benefit of demand bundling is the opportunity to reduce wholesale prices, which is due to increased bargaining power and higher volume discounts, which could not be realized by each individual company itself.

**Reduced wholesale prices**

#### Risks

Obstacles for implementing this type of cooperation can come from attitudes of employees, such as „We have never cooperated with competitors before!“. For indirect goods the argument of risks stemming from disclosing procurement data to competitors obviously does not hold true; but it might be legitimate, if material requirements for the core business have to be revealed to competitors. Additional problems can come from inflexible processes or employees, since procurement processes usually have to be restructured in order to implement this strategic option.

**Inflexible employees**

**Inflexible processes**

## Critical success factors

Bundling demand usually requires long-term planning. It is therefore fundamental to be able to plan demand for the required period and to implement procurement processes accordingly, which support techniques for estimating future demand.

**Plan demand**

Cooperation for demand bundling requires interaction with different business partners or intermediaries, respectively. This interaction and communication can only be achieved if a (communication) standard is agreed upon and supported by all parties.

**Consider standards**

## Necessary competences

In order to implement this initiative and maximize possible benefits it is necessary to be innovative and flexible in adapting procurement processes. The responsible managers also have to know how to organise mid- and long-term planning of the company's demand.

## 2.2.2. Cooperation with value chain partners

For cooperating with value chain partners over the Internet two consecutive steps can be distinguished: the first step is fundamental and involves coordinating and optimizing processes across the companies' value chains ('process coordination'). The second step involves automation of these processes, which requires the additional integration of relevant business information systems and the implementation of an integrated process control ('process automation').

### 2.2.2.1. Process coordination

In particular functions and processes at the external interfaces – such as logistics and procurement – are affected by coordinating and optimizing processes crossing the company's boundaries.

Useful: Reference processes for procurement procedures across the value chain, models for analysing and optimizing processes across business boundaries.

## Necessary investments

The concerted optimization of processes across business boundaries requires analyzing the relevant processes of the respective business partners and the mutual agreement on a new process design. Additionally, it is necessary to agree on standardised communication formats (e. g. for orders or invoices) in order to avoid costs for multiple data entry.

**Process analysis and design**

**Selection of communication standards**

## Chances

A concerted analysis and adaptation of business processes allows optimizing processes across company boundaries and in this way reducing overall production costs and cycle times.

**Reduced costs and cycle times**

## Risks

The main risk for implementing this strategic option consists of the challenge to take on a perspective crossing your own businesses boundaries and not to push ahead the optimization of your own company's activities.

**Narrow perspective**

Since processes are analysed and optimised across business boundaries close dependencies are established between the respective companies. These dependencies can prove as disadvantage if one of the business partners decides a strategic move into a new direction or one of the companies you have relied on goes bankrupt.

**Dependencies**

## **Critical success factors**

All the relevant planning, production, and exchange processes of the entire value chain need to be optimized across business boundaries.

**Process optimization**

The respective companies have to have a mutual interest and a mutual goal in engaging in this cooperation; they must be united by a shared 'vision'.

**Shared vision**

In order to allow the communication between different organizations a mutual language is necessary. Enterprise and process models can serve as 'mediators' at this point.

**Mutual 'language'**

## **Necessary competences**

It is essential to be able to take upon a value chain oriented viewpoint, i.e. a perspective across your own businesses boundaries and interests. Furthermore, knowledge in process analysis, modelling and optimizing is necessary to take advantage of the benefits of this strategic option.

### **2.2.2.2. Process automation**

Coordinated processes are a prerequisite for automating business processes across company boundaries. Process automation additionally requires standardised communication of the respective information systems.

Useful: The process models developed for coordinating processes across business boundaries can be used as basis for an automated process control unit and they indicate requirements for the data exchange formats.

## Necessary investments

If the first step (namely process coordination) has already been achieved, it is now necessary to design and implement a process control system across business boundaries. Standards for communication and interface definitions need to be selected and further specified. Additionally, it should be considered that it might be necessary to implement further security measures for exchanging business data across business boundaries.

**Process control**

**Standards**

## Chances

By fully automating the processes and removing media breaches transaction costs can be minimized.

**Minimal transaction costs**

## Risks

As mentioned in the previous section, close cooperation with business partners leads to dependencies due to the high investment costs and specific process adaptations. Business relation specific investments are even higher, if technological infrastructure and communication standards are implemented with respect to a certain business partner.

**Dependencies**

## Critical success factors

It is necessary to agree upon an appropriate standard for communication, in order to allow the integration of the technological infrastructure. Here, it is crucial to select the 'right' open standard in order to minimize the business partner specific investments and, therefore, the dependencies to individual companies.

**Standards**

In order to minimize the necessary future changes in the technological infrastructure and process control it is necessary to take great care over process analysis and design, so that identified processes are stable over time.

**Sound process models**

## Necessary competences

In particular the knowledge of applying process models as basis for process control systems is necessary.



### 2.2.3. Cooperation with suppliers of complementary products

On the Internet costs of communication can be reduced significantly. This allows cooperating with suppliers of other, usually complementary, products with very few additional costs. This type of cooperation is frequently named network or virtual enterprise; the various ways of its implementation can be distinguished according to the product related functions that are performed mutually. Aspects of product development and presentation, sales and logistics, as well as collecting and using customer data will be discussed in the following paragraphs.

Useful: Process models for market analysis with respect to cooperation opportunities, reference process models as basis for implementing processes in the different business functions or value chain activities across business boundaries.

#### Necessary investments

Cooperation across business boundaries usually requires coordinating the relevant processes as well as designing and implementing supporting technological infrastructure. These initial costs differ depending on the particular product or service and are usually specific for the respective cooperating company.

**Coordinated processes**

If two businesses want to cooperate with respect to product development, it is necessary to agree on a data format (standard) for the exchange of product design models.

**Standardised product data**

If a cooperation in terms of product presentation is planned, a shared Web presence (and/or the consecutive evolutionary stages, see section 2.1) has to be designed and implemented. Additionally, shared processes for maintaining the Web site and relevant databases need to be developed.

**Shared Web site**

If two companies want to cooperate in the areas of sales and logistics, it is necessary to agree upon customer data models and product catalogue formats. Additionally, processes need to be implemented, which coor-

**Standardised customer data and product catalogues**

dinate the order processing between both companies.

If the respective companies want to collect and use both of their customers' data, it is necessary to agree on a consistent privacy policy and to coordinate the processes of customer interaction and customer data collection.

**Coordination of customer interfaces**

## Chances

Cooperating with other suppliers offers the opportunity to further concentrate on your core business. At the same time you can take advantage of the bargaining and marketing power as well as the infrastructure and resources of the other company. Furthermore, the new potentials for differentiation from your competitors can be realised.

**Specialisation**

**Additional resources**

**Better differentiation**

## Risks

Since high dependencies emerge from close cooperation, the risks of this strategic option frequently depend on the selected business partners. Other challenges can arise from resistance of organisational units or employees, that are affected by process adaptations or outsourcing.

**Dependencies**

**Inflexibility**

## Critical success factors

The technological infrastructure and information systems of the relevant business functions have to be sufficiently integrated and powerful.

**Integrated IS**

It is necessary to consider open standards in order to integrate the information systems of two different companies.

**Standards**

The cooperation with other companies should put forth benefits and added value comprehensible from the customer's point of view.

**Benefits for customers**

Partitioning of responsibilities, cost allocation, and quality standards have to be agreed on and defined clearly by the respective companies.

**Clear rules**

## Necessary competences

In order to implement this strategic option, approaches for integrating information systems should be known. Additionally, process analysis

and modelling is fundamental for this type of cooperation, too.

### **2.3. Electronic procurement**

Communicating and interacting with suppliers can be supported by using the Internet in many ways. It can be used to only gain information about products and prices. It can also be used for actually performing transactions on the basis of product catalogues or electronic Requests for Proposal (reverse auctions).

### 2.3.1. Information

The Internet can be used to (only) retrieve information about features and prices of products that need to be procured. The actual procurement can then be performed using the traditional procurement processes.

#### Necessary investments

Only very few investments in technological infrastructure are necessary to allow the respective employees access to the Internet. Further security measures might be necessary to protect the own Intranet from malicious attacks over the Internet.

Internet access

„Firewall“

#### Chances

The employees can access relevant price and product information with very few additional costs and without any geographic or temporal limits. With more and improved information it is possible to better compare offers and increase your own bargaining power.

Better access to product data

Increased bargaining power

#### Risks

This strategic option does not require many changes in business processes or technological infrastructure. So, there are usually no significant risks. It has to be considered, though, that the respective employees might have to be trained, in order to be able to effectively use the Internet.

#### Critical success factor

The benefits of this initiative can only be realized if the relevant information is actually accessible and comparable over the Web, and if information retrieval is more efficient and effective than through current processes.

Availability

Accessibility

#### Necessary Competences

A beneficial competence is the purposeful and deliberate selection of information on the Internet.

### 2.3.2. Procurement

As mentioned above, the Internet can be used to support procurement processes in two ways: for purchasing goods through electronic market places or for electronic Requests for Proposal (reverse auctions). However, there are fundamental aspects, which are relevant for both approaches of electronic procurement (E-procurement), which will be discussed in the following paragraphs. Necessary investments and opportunities specific for each approach will then be discussed in separate subsections.

Useful: Reference processes and models for electronic procurement.

#### Necessary investments

The new ways of electronic procurement have to be integrated with current processes. Usually, procurement processes in general have to be adapted and centralized to take advantage of all the benefits. Depending on the current way of data modelling and storage, it might require a lot of time and effort to adapt the supply data according to the format of the respective electronic platform (see [BHK02] p. 32).

**Integrated procurement processes**

**Supply data adaptation**

#### Chances

If input goods are ordered electronically, transaction costs to suppliers can be reduced dramatically. This can be due to more centralized and optimized processes and/or to the company wide standardisation and automation of the respective processes.

**Reduced transaction costs to suppliers**

#### Risks

Independent of the particular type of electronic procurement chosen, procurement processes usually have to be adapted. Therefore, inflexible organisational or process structures can impose risks on the success of electronic procurement initiatives.

**Inflexible structures**

### 2.3.2.1. Catalogue based systems (E-Shops, Electronic Marketplaces)

E-Procurement systems based on product catalogues are usually applied for procuring indirect goods (C-parts, MRO-material), frequently called *Buy-Side* systems (see [BHK02] p. 16).

#### Necessary investments

Apart from adapting processes and formatting supply data, it is necessary to integrate the existing business information systems with the respective electronic marketplace or e-shop (see [BHK02] p. 34). The integration might involve the definition of exchange standards and the definition of interfaces for process control.

Integration

#### Chances

Costs can be reduced through the internal bundling of procurement activities and through optimizing procurement processes. Apart from the potential for cost reductions, an E-procurement platform leads to higher market transparency, which tends to result in lower wholesale prices on these market places (see [BHK02] p. 34).

Reduced costs

Lower prices

#### Risks

A potential drawback of engaging in a certain electronic procurement platform comes from the fact, that usually not all suppliers are willing (or able) to provide their goods over the same platform or channel. It is therefore frequently necessary to concurrently maintain different procurement processes. So, many times the potential of reducing transaction and process costs can not fully be taken advantage of (see [BHK02] S. 34).

Multiple procurement processes

#### Critical success factors

In order to take advantage of all the potential benefits, it is necessary to centralise procurement processes, particularly for indirect goods.

Centralizing procurement

Exchange standards for product catalogues and open standards for business documents need to be considered.

Standards

In order to maximize the benefits in terms of reduced transaction costs

Integration

it is necessary to fully integrate the existing business information systems with the electronic market place.

## Necessary competences

In order to decide upon the right E-procurement approach it is necessary to know the criteria to assess electronic procurement platforms. Since process redesign is necessary, it is also useful to know process modelling and analysis techniques.

### 2.3.2.2. Electronic Request for Proposal (reverse auction)

Electronic tendering is usually applied for high-priced and complex products, which require intensive descriptions (see [BHK02] p. 17). The electronic support allows for automated control of the tendering process and the electronic submission of requests and electronically receiving tenders.

Useful: Reference models, which describe and assess typical auction processes and possible features and variations.

## Necessary investments

Electronic reverse auctions usually do not require many initial investments. It is however necessary to adapt the data format of the requests to a common standard, so that it can be automatically searched for and processed by potential suppliers.

## Chances

Since tender based procurement processes are standardized, transaction costs can be reduced significantly (see [BHK02] p. 35). Without significant additional costs a request can be sent to multiple potential suppliers; because of the standardized format proposals can more easily be compared; and using the Internet the search for potential suppliers is less costly. Since Requests for Proposal are usually used for high volume projects and only very few initial investments are necessary, electronic tendering promises quick returns (see [BHK02] p. 35).

**Reduced process costs**

**Scalability**

**Quick returns**



## **Risks**

There are no direct risks.

## **Critical success factor**

In order to allow the comparability of proposals, standards for requirements specification and product modelling have to be considered. **Standards**

## **Necessary competences**

It is very helpful to know the different kinds of reverse auctions, their special characteristics and implications for the final result of the tendering process.

## **2.4. Market extension**

Using the Internet allows - apart from the geographical market extension (see section 2.1) – extending market reach along the value chain as well as offering new products.

### 2.4.1. Extension along the value chain

The Internet offers new economic ways for taking over the functions of former value chain partners. Special consideration should be given to the opportunity of vertical integration, i.e. the adoption of intermediary functions towards the consumer. By directly serving the end-customers over the Internet, fees for mediation – formerly paid to intermediaries – can be saved ([Alte02] p. 11).

**Vertical forward integration**

Useful: Process models for analyzing markets of the subsequent value chain level according to industry specific characteristics; process and reference models for developing new sales and logistics processes; reference models for customer interaction (see section 2.1.3).

### Necessary investments

It is essential to precisely analyze the relevant factors and economical conditions on the new market, before the decision about taking over functions of the subsequent value chain level can be made. When the decision has been made to surpass traditional intermediaries and directly serve the (new) market it is necessary to design and implemented processes for logistics and distribution and sometimes to establish new organisational units to supervise and perform these processes (see [ZPS+00] p. 241). (See also transaction initiation and implementation in section 2.1.)

**Market analyses**

**New processes and organisational units**

### Chances

Charges formerly paid to intermediaries can now be saved and, if applicable, be passed on to the customer in the form of price reductions. It is possible to better differentiate from competitors, because sales channels can be controlled directly and services of superior quality are possible [Port98].

**Saved fees**

**Reduced prices**

**Better differentiation**

### Risks

If the company's market share on the end market is too small, it is likely that the costs for providing the additional functions (of this next value chain level) cannot be compensated by the sales. This can be the

**Small market share**

**High costs**

case, if sales volumes are so low that scale effects, which former intermediaries could take advantage of, cannot be realized.

## **Critical success factors**

If you want to expand your activities along the value chain it is crucial to analyse the conditions on the new market and to accurately assess the competitive factors.

**Market analysis**

It has to be evaluated if the Internet can serve as platform for entering the new Market, i.e. if it can support all the functionality necessary for the next level in the value chain.

**Appropriateness of the Internet**

The customer will only adopt the direct access if there are recognizable benefits in comparison to the added values already offered by (former) intermediaries. Additional incentives can be given if cost advantages are passed on to the customer in terms of lower prices.

**Advantages for consumers**

## **Necessary competences**

It has already been pointed out, that it is crucial to assess and analyse the new markets. So, knowledge in market and industry sector analysis is necessary.

### **2.4.2. New products**

The Internet offers multiple opportunities to sell new products over the Web while taking advantage of synergies with core business activities. It allows, for example, providing professional information, offering individual consulting services, or providing business partners with technological infrastructure to maintain their own Web presence. Here, on the one hand the professional knowledge existing in a company can be used. On the other hand, knowledge about customers or business partners can be taken advantage of (for example through log file analysis).

The necessary investments are usually related to new technological infrastructure and, if applicable, to the creation of new organisational units or processes, which perform the activities necessary to provide the new service.

Here, the opportunities for providing new products will not be discussed in further details. The specific requirements differ depending on the particular product or service provided. Guidelines for Internet usage can be deduced from the discussion of the other strategic options in this section.

## **2.5. Customer oriented initiatives**

Apart from the mere Internet presence, providing product catalogues, and the possibility to order products over the Web, the Internet allows further measures which are based on the needs and potential of individual customers. Some of them aim at a better differentiation from the competitor, for example through additional information or customer oriented processes. Others aim at individualising customer relationships and fully exhausting the customer potential, for example through dedicated cross-selling initiatives or individualised pricing.

### 2.5.1. Additional information

Providing product or product usage information is an added value for your customers and in this way a means for further differentiation from your competitors. Prominent examples are product information or maintenance databases accessible over the Web and lists of frequently asked questions (FAQs).

#### Necessary investments

Initial investments are necessary for, on the one hand, providing the relevant information in terms of creating the Web sites and a database. On the other hand processes have to be established for maintaining and administrating the product related content.

**Web pages and database**

**Maintenance processes**

#### Chances

Providing additional information can serve as a criterion for further differentiation, but it usually does not hold as a sustained competitive advantage, because it can easily be imitated by competitors. But it can support closer relationships to existing customers and the acquisition of new customers, because it is freely available over the Web.

**Added value**

#### Risks

Since relatively little investments are required, implementing this option does not imply any direct risks. However, there is the risk of customer expectations and bargaining power to increase due to the information now being freely available.

**Higher customer expectations**

#### Critical success factors

It is crucial to maintain a high quality standard for the information provided. It ought to contain contents actually relevant to customer needs and it has to be updated on a regular basis.

**Information quality**

Customer feedback concerning the relevancy and appropriateness of the information should be taken seriously and integrated in the maintenance process.

**Integrate feedback**

## **Necessary competences**

It is important to know the customer needs and to model and present the information accordingly.



## 2.5.2. Customer oriented processes

Better customer orientation on the process level can be achieved by two different initiatives. The first one is fundamental and aims at better directing business activities to actual customer needs by aligning business processes specifically with the customers' requirements. The second approach aims at increasing process transparency by making production and order status information easily available for the customer.

### 2.5.2.1. Aligning processes with customer needs

A fundamental initiative for better customer orientation is the alignment of business processes with customer needs and value creation from his point of view. I. e. this initiative's results should be noticeable by your customers and better fulfil their needs, as, for example, faster cycle times or order deliveries.

Useful: General process models and catalogues with characteristic aspects of lacking customer orientation; reference processes of customer interaction.

## Necessary investments

Since process improvements from the customer's viewpoint are the aims of this strategic option, it is necessary to analyse and redesign relevant processes across functional or departmental boundaries, which can be relatively time consuming. The implementation of the process changes can then be facilitated by process supporting software, such as Workflow Management Systems.

**Process analysis and redesign**

**Process supporting software**

## Chances

The process analysis facilitates the increased efficiency and effectiveness of processes from the customer's perspective. For example, media breaches and lacks of coordination between the organisational units serving different customer channels can be eliminated. These improvements can facilitate higher customer satisfaction and better customer retention.

**More efficient processes**

**Better customer retention**

## Risks

A main challenge of implementing this strategic option is the process analysis across functional and departmental boundaries, because here the interests of individual departments need to be given lower priority than customer needs and overall value creation for the customer. So, the process redesign can easily fail if decision makers are not able to give up their 'departmental thinking'.

**'Departmental thinking'**

## Critical success factors

As already mentioned, for successful process redesign it is vital to consequently align with customer needs and to take on the customer's viewpoint. This can, for example, be implemented by directly asking the customers in structured interviews and the general approach of business process analysis starting from the end (i.e. the fulfilment of customer needs).

**Alignment with customer needs**

It is important, to build appropriate working teams for analysing current processes and enforcing the process changes. The acceptance and power of the decision makers and implementers are vital for enforcing the process changes, because process analysis and design will have impacts across departmental boundaries.

**Acceptance and power of decision makers**

## Necessary competences

Fundamental competences for successfully implementing this strategic option are cross-departmental thinking, process analysis and design, as well as project management techniques.

### 2.5.2.2. Higher process transparency

When looking at the potential of Internet usage for further customer orientation, aligning business processes with customer needs is just a preliminary stage. The Internet itself can be used to increase the transparency of business processes from the customer's perspective by, for example, providing product development and order status information online.

Useful: Reference models and descriptions of relevant aspects of process transparency from the customer's viewpoint.

## Necessary investments

If processes have already been aligned with customer needs, it is now necessary to invest in additional process controlling software and integrate the relevant business information systems with the Web front-end the customer has access to. It might also be necessary to additionally implement security and authentication mechanisms (see section 2.1.3).

**Additional functions on the Web**

**Authentication, security**

## Chances

Business processes oriented towards customer needs and transparent for the customer can serve as sustained criterion for differentiation from the competitor.

**Sustained differentiation**

## Risks

The relatively high investments for an integrated process control can be transformed into sustained competitive advantage. However, no direct increases in sales stand alongside these investments.

**No direct sales increase**

## Critical success factors

It is critical for the order status information to be reliable and updated on a regular basis.

**Timeliness**

If multiple channels of communication and interaction with the customer are supported, he should also be enabled to access process status information through all channels.

**High accessibility**

In order to provide reliable sources of information over the Internet it is crucial to appropriately integrate the respective information systems.

**Integration**

## Necessary competences

It is necessary to know the needs and requirements of the customer concerning process transparency and to know how to implement the new functionality on the Web.

### 2.5.3. Fully exhausting customer potential

The Internet allows a company to cheaply individualize the communication with each customer (for example through individualized E-mails or cookie-based individualized Web pages). This potential for individualization facilitates several options for more fully exhausting customer potential. One strategic option is developing emotional dependencies and providing personalized information on a regular basis (see section 2.5.3.1). Other strategic options involve individualized product offerings to the customers (see section 2.5.3.2) and individual pricing mechanisms (see section 2.5.3.3).

Reference models representing relevant customer data, such as product preferences, history of purchases, willingness to pay, and the connections to product models are useful for implementing all of the following strategic options.

#### 2.5.3.1. Emotional customer retention

Better customer retention can be achieved by, for example, sending newsletters with information about new products and professional information on a regular basis. Another approach are Web based communities, in which customers can interact with each other by exchanging experiences about purchases and discussing other fields of interest. Communities can facilitate emotional retention, because they provide infrastructure for building social networks with other customers.

**Newsletters**

**Web-Communities**

### Necessary investments

If an Internet presence has already been built, there are only very few initial investments necessary. Sending a newsletter requires the creation of a database to hold all the relevant customer information and the integration of the database with an E-mail application. Building a Web community requires defining the functionality that should be provided inside the community and selecting an appropriate platform; here, it is usually sufficient to configure already existing software.

**Minimal investments for additional technical infrastructure**

### Chances

After a newsletter has been set up it is possible to reach a (theoretically) unlimited number of customers for almost no costs. (However, spam

**Cheap customer information**

mail has grown to be a relatively big problem on the Internet. It is therefore crucial to provide information subscribers consider useful, too.) A Web community can lead to enhanced emotional customer retention. Additionally, it is possible to retrieve information about customer preferences and attitudes by analyzing the community platform.

**Emotional retention**

**Customer data**

## Risks

Software for building communities on the Web is freely available; this is also the case for newsletters and databases. Hence, these strategic options can easily be imitated and, therefore, cannot be used as long-term sustained competitive advantage.

**No sustained competitive advantage**

## Critical success factors

Web communities in particular are frequently used successfully for further customer retention. However, a few fundamental aspects need to be considered:

- Critical mass of functionality [WiCo01]: a Web community has to provide its users with a certain minimum of functionality in order to provide real added value.
- User feedback [WiCo01]: in particular at the beginning of building up a Web community user feedback should be taken seriously and considered for further aligning the community with the needs of current and future customers.
- Using information about customers: a community usually provides various ways for its users to communicate about relevant topics and experiences. So, apart from using the Web community for emotional customer retention, it should be used for retrieving better information about customer preferences and attitudes related to products and purchasing experiences.
- Personalizing functionality and content (see [Rais01] p. 121 ff): the community design should provide options regarding the selection of certain functionalities and contents in order to allow the customers to individualize their view onto the community accord-

**Provide critical mass of functionality**

**Integrate feedback**

**Use customer information**

**Personalize functionality and content**

ing to their personal preferences.

## Necessary competences

Implementing this strategic option does require some knowledge in configuring the respective technical infrastructure and purposefully using the community functionality for your business.

### 2.5.3.2. Cross- and Up-Selling

As mentioned above, the Internet allows your company to cheaply individualize the communication to the customers. This can be used to suggest individual customers certain product offers after a purchase has been performed. Such a cross- or up-selling initiative requires consequently selecting and evaluating customer data through data mining techniques.

## Necessary investments

Initially, an integrated data model representing relevant customer information has to be developed. The respective information systems and databases have then to be adapted to support this new model; this integration can be relatively cost intensive, because usually data models are chosen individually for each application. Since the data necessary for generating product offers comes from different departments and information systems, processes have to be implemented which support merging all the relevant data. A central database storing customer data has to be implemented and connected to relevant information systems. This *Data Warehouse* should relate customer data to product information also representing changes over time; and techniques for evaluating the data should be supported.

**Integrated customer data model**

**Processes form merging customer data**

**Central Data Warehouse**

## Chances

Purchasing frequencies can be improved for each customer by customizing individual product offers according to his interests and needs. By collecting and evaluating purchasing data for each customer individually, classifications of customer types can be derived, which give further insights into their expected profitability; on this basis, it is possible to allocate resources according to expected sales volumes (*customer lifetime value*).

**Increased purchasing frequencies**

**Systematic resource allocation**

## Risks

Direct product offerings and aggressive customer communication might not harmonise with your company's traditional image. Furthermore, focussing too much on existing customers incorporates the risk of neglecting initiatives for acquiring new customers or extending your business activities to new markets and target groups.

**Incompatible image**

**Neglecting new customer acquisition**

## Critical success factors

Implementing this strategic option requires the collection and evaluation of customer related data. Therefore, it is crucial to consequently implement a privacy policy and publish it easily accessible for your customers.

**Privacy policy**

In order to maintain the usefulness of the collected customer data, it is necessary to regularly update the databases. Additionally, it is vital to constantly optimize the data models in order to represent the improved knowledge about relationships between customer characteristics and purchasing behaviour.

**'Learning' models**

## Necessary competences

The competences vital for implementing this option are related to data modelling methods and data mining techniques.

### 2.5.3.3. Individual pricing

Setting prices individually for each customer allows minimizing consumer surplus. However, a fundamental prerequisite for individual pricing is the knowledge about the customer's willingness to pay.

## Necessary investments

Analogous to cross-selling, for individual pricing it is vital to develop an appropriate model of relevant customer information and to integrate the respective technical infrastructure. In order to facilitate individual pricing the data models and data mining techniques have to be augmented by concepts for the willingness to pay and indicators for customers' valuations, respectively, as well as concepts representing dif-

**Concepts for willingness to pay and pricing mechanisms**

ferent pricing mechanisms..

## Chances

Individual pricing allows maximising producer profits by minimizing consumer surplus (given the prerequisite that the willingness to pay is higher than productions costs).

**Maximising profits**

## Risks

Information concerning the willingness to pay is only in very few cases directly accessible or completely available. Hence, many times the effort necessary to retrieve the information about the customer's willingness to pay is higher than the additional producer surplus achieved by individual pricing.

**Incomplete information**

It has frequently been argued that with the Internet market transparency might increase and consequently the consumers' willingness to pay is going to decrease (e.g. [Bako98] [Port01]). This is a general threat to industries using the Internet and requires initiatives for further differentiation (e.g. through individualised products or added services).

**Transparent markets**

## Critical success factor

In order to successfully implement the strategic option of individualized pricing it is necessary to perform further initiatives to decrease market transparency (e.g. individualising products), so that individual prices are comprehensible by the customers.

**Decrease market transparency**

## Necessary competences

Apart from knowledge of data modelling, it is vital to know the different pricing mechanisms and techniques to identify the willingness to pay according to other available customer information.



### 3. Designing a strategy mix

The previous sections have described the prerequisites and characteristics of different strategic options for using the Internet. In this section, guidelines are given to indicate the appropriateness of a certain strategy in a particular business case. Furthermore, it will be discussed, how the different strategic options can be combined to form a 'strategy mix'.

#### Main issue:

"To what extend is your industry sector currently (or possibly in the future) affected by a structural change?"

The strategic options described above apply to either procurement or sales markets. In both cases it is necessary to first analyse the respective market in order to find out to what extend it has been or is going to be affected by a structural change. Such a structural change can materialize in terms of restructured value chains, eliminated traditional intermediaries, or a change in products and services offered. The reasons for such structural changes can stem from three different factors:

- **Globalisation:** For each industry sector it should be analysed to which extend globalisation initiatives (such as opening of the EU internal market and WTO-contracts) might affect cost structures and value chain structures in that industry.
- **Technological progress:** It should be evaluated to which extend the general technological progress might affect production processes as well as production and transaction costs of companies in the respective industry sector.
- **Deregulation:** The decline of governmental interferences and regulations on the markets has been more or less profound in different industries (as for example in Europe through major EU guidelines). Therefore, the impact of decreasing governmental interference on the competition and structural conditions in the markets also has to be assessed.

For instance, information intensive industry sectors (e. g. travel agencies or other information service providers) are usually more affected by a structural change than traditional handcrafting companies. However, in particular handcrafting businesses (in the European Union) need to take into account the increasing competition caused by businesses of foreign EU countries getting onto formerly restricted national markets.

Further criteria for defining an appropriate E-Commerce strategy with respect to the special requirements of SMEs will be discussed in the following subsections. After the discussion of relevant aspects for sales and procurement markets (section 3.1 and 3.2), different perspectives for structuring the strategic options and configuring a strategy mix will be suggested in section 3.3.

### 3.1. Sales markets

A number of criteria for assessing the applicability of strategies has been suggested in the context of various portfolio-methods. Some of these criteria can also be applied as guidelines to select the appropriate strategic option for electronic commerce. In general, market and company specific characteristics are distinguished.

#### Company characteristics

Relevant characteristics of a company are usually related to

- various aspects of the company size as compared to the whole market or the largest competitor (e.g. market share, growth rate, and financial power), **Size**
- existing differentiation advantages and potential for innovation, **Differentiation advantages**
- the efficiency of business processes, and to **Efficiency**
- relevant competences such as qualification of leadership, IT-competence, and flexibility of employees. **Competences**

#### Market characteristics

The market characteristics usually analysed are related to market growth and the competitive forces introduced for the assessment of industry attractiveness as suggested by Porter [Port98]:

- Market growth: Traditional SMEs in the craftsman business are active in markets with very small growth rates. Specialised service providers in dramatically growing markets should therefore be distinguished from other SMEs in markets with relatively low growth rates. **Market growth**
- Competitive forces of the industry structure: Here, relevant characteristics of customers (e. g. structure and stability of demand), suppliers (e.g. structure and bargaining power), and competitors (e.g. number and size) need to be considered. **Industry structure**

(e.g. number and size) need to be considered. Additionally, threats posed by new competitors and product substitutes should be analysed.

**Market transparency**

In order to assess strategies on the Internet, market transparency and price margins should also be considered (see e.g. [Port01]).

**Price margins**

### **Main issue:**

“To what extent are these characteristics typical for your sales market?”

### **financial power, IT-competence, flexibility –**

### **market transparency, competition**

Most strategic options applicable to sales markets can be assessed using the criteria of financial power, IT-competence and employee flexibility as internal factors and market transparency as well as intensity of competition as market related factors (see Figure 3).

**Evolutionary stages**

For the different evolutionary levels, as well as for the three degrees of customer orientation a higher flexibility of the employees is necessary, because of the obligatory adaptation of business processes. In general, the implementation of the consecutive evolutionary steps is only appropriate if market transparency and competition increases at the same time. However, if a company has a high potential for innovation, it might be appropriate to actively increase competition and take advantage of the first mover's benefits.<sup>1</sup>

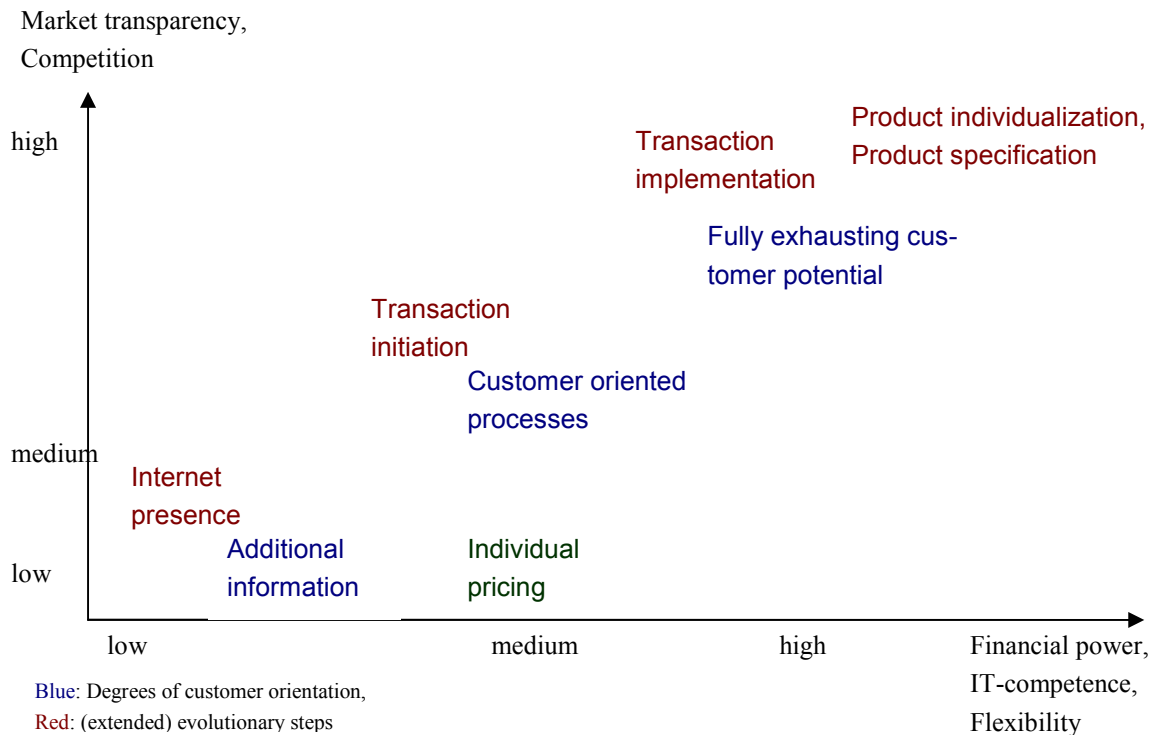
**Degrees of customer orientation**

The strategic option of individual pricing is a special case, because a low market transparency is needed and the necessary costs can hardly be estimated.

**Special case: individual pricing**

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<sup>1</sup> Note that being the first mover by itself does not necessarily guarantee a sustainable competitive advantage, but differentiation advantages and the potential for innovation are of crucial importance (see [RaAd01] pp. 62 ff).



**Figure 3: Sales market – strategic options**

The two remaining strategic options applicable to sales markets – vertical forward integration and cooperation with suppliers of complementary products – depend on different factors.

### **sales volume – stability of demand**

In general, extending the market along the value chain can apply to procurement markets (vertical backward integration) or to sales markets (vertical forward integration). In both cases, the potential benefits of implementing the strategy depend on the respective sales volumes. For example, on the sales market the respective company's number of sales has to cover the additional expenses necessary to provide the added functionality [Port98].

**Vertical forward integration**

Apart from market share the vertical forward integration is dependent on the stability of demand on the end markets. Very unsteady demand can be the reason for implementing a forward integration, because now market information is much sooner available and can be used more effectively for forecasting future changes in demand [Port98]. If demand

is rather steady the information accessible through intermediaries might be sufficiently timely and accurate.

### **differentiation advantages , financial power – market entry barriers**

In order to assess the appropriateness of cooperation with suppliers of complementary products the criteria of differentiation advantage, financial power and high market barriers become relevant. If a company's own potential for differentiation advantages is very limited it can be beneficial to cooperate with suppliers of other products and in this way further enhance the differentiation from competitors. Additionally, if financial power is very limited but market entry barriers are relatively high it can be beneficial to be able to fall back on resources and relationships of business partners.

**Cooperation with  
suppliers of com-  
plementary products**

## 3.2. Procurement markets

When looking at procurement markets, similar company characteristics as applied for sales markets (see previous section) can be used for assessing the appropriateness of the different strategic options. The procurement specific market and company related characteristics will now be discussed.

### Market characteristics

The strategically relevant characteristics of procurement markets are usually related to:

- market power, which is usually closely coupled with market share on the procurement market (e. g. in automobile industry procurement markets), **Market power**
- the availability of vital resources or inputs for production, and **Available resources**  
**Market stability**
- the stability of market structures (particularly from the viewpoint of SMEs).

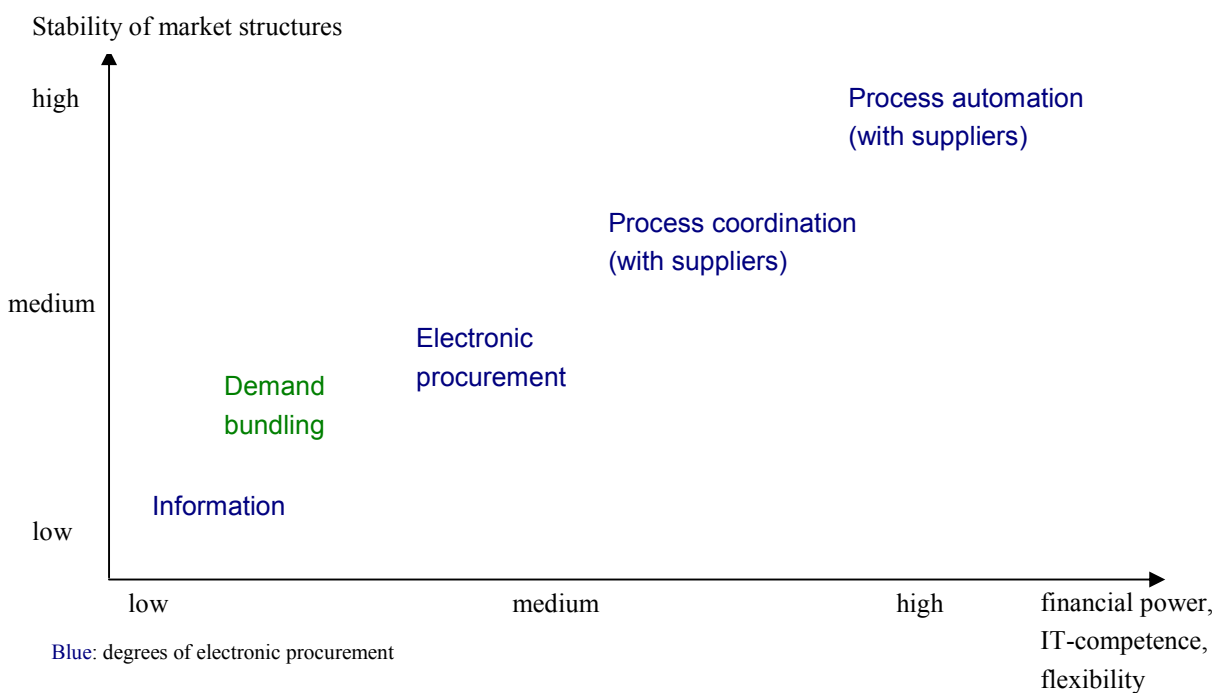
### Company characteristics

The specificity of vendor parts with respect to differentiation advantages can serve as an additional criterion. **Specificity of vendor parts**

#### Main issue:

“To what extent are these characteristics typical for your procurement market?”

Figure 4 presents the strategic options of using the Internet for electronic procurement. Similar company characteristics are applied as used for analysing sales markets, but as a market related criterion the stability of market structures is another important factor. This is due to the fact that close relationships through integration of processes and technical infrastructure can only be advised if market structures are relatively steady. However, this is not necessarily the case, if the respective business information systems are sufficiently flexible and adaptable to support structural changes.



**Figure 4: Procurement market – strategic options**



### 3.3. „Perspectives“

When defining an E-commerce strategy it is crucial not to be biased in a single direction (e. g. striving for cost reduction only), but the entire Internet strategy should be well-balanced to a certain degree. The Balanced Scorecard has become very popular in practice during the last 10 years, because of its claim to follow the objective of being ‘well-balanced’. It considers different views or perspectives at a company and in this way overcomes the typical problems of traditional performance measurement systems, which focus solely on the financial aspects of an enterprise (see [KaNo92], [KaNo96]). The scorecard suggests the following four perspectives for a holistic performance measurement:

- The *Financial Perspective* is aligned with typical controlling objectives related to profitability, growth and shareholder value.
- The *Customer Perspective* is aligned with objectives relevant from the customers’ point of view, such as quality, performance, and, service.
- The *Internal Perspective* translates the customer based measures into internal measures concerning business processes, fulfilment, and productivity.
- The *Innovation and Learning Perspective* is based on measures for assessing the ability to launch new products, the potential to learn and to further improve processes.

The different perspectives can serve as guideline to categorize the different strategic options. Additionally, they point out that it does not make sense for a company to concentrate on just one perspective for configuring their strategy mix. It should rather contain strategy parts belonging to each of the four perspectives.

### Main issue:

“Does your E-commerce strategy consider objectives and aspects of each of the four perspectives?”

- 1. Financial Perspective:** When defining an E-commerce strategy for SMEs the financial perspective is considered (only) to point out that SMEs in particular suffer from very limited resources. Therefore, only those strategies and objectives should be taken into account, which adhere to the restricted financial power of the respective company. Additionally, the potential of the Internet to significantly reduce transaction costs can serve the general objective of long-term cost reductions.
  
- 2. Customer Perspective:** The strategic options noticeable by the customers are all those measurements, which affect the company's presentation, the availability of information and the customer's possibility to communicate and interact with the company:
  - Provision of additional information on the Web.
  - Improvement of process transparency and (order) cycle times.
  - Price reductions (based on decreased production and transaction costs).
  - Value adding services over the Internet (i. e. initiatives for further differentiation according to the evolutionary steps).
  - Added value through cooperation with suppliers of complementary products
  
- 3. Internal Perspective:** Here, in particular those processes are considered, which create additional value for the customers. In terms of Internet usage, possibilities for further improving the efficiency and effectiveness of procurement processes and initiatives for fully exhausting customer potential are to be considered.

- Alignment of processes with customer needs and process optimization.
- Electronic procurement and demand bundling.
- Further specialisation through cooperation.
- Initiatives for fully exhausting customer potential, such as cross-selling and individual pricing.

**4. Innovation and Learning Perspective:** Flexibility is an important characteristic for employees affected by changes through the implementation of strategic options for E-commerce. This characteristic is very important for extending the markets through vertical integration or the introduction of new products. Many of the suggested strategic options require employees' willingness to adapt their every day working processes to new requirements, since the corresponding initiatives usually require changes in business processes because new communication channels have to be integrated.

- Flexibility
- Willingness to learn

For example, an appropriate strategy mix should not only concentrate on objectives of the Internal Perspective, e. g. cooperation and integration of processes with other suppliers. But further important aspects of the other three perspectives have to be considered; these could be for instance:

- Available financial resources and the contribution to the objective of cost reduction (Financial Perspective).
- Value added for the customers (Customer Perspective).
- Additional requirements for employees (Innovation and Learning Perspective).

## 4. Conclusion

This paper has given insights into different strategic options of using the Internet from the perspective of small and medium sized enterprises. Starting with various possible main objectives a number of partial E-commerce strategies has been developed and described with respect to associated chances and risks, necessary investments, and factors critical for a successful implementation. The last section discussed relevant enterprise and market characteristics, which can be applied to assess the appropriateness of implementing a certain strategy in a particular business context; relevant characteristics for assessing the strategic options' applicability were presented.

The suggested framework can be utilized as a guideline for structuring and selecting strategies for Internet usage in your company. It has been pointed out several times throughout this paper that economically conducting business over the Internet requires a more or less extensive adaptation of business processes. When looking at the model of evolutionary steps for interacting with the customer over the Internet, the process changes necessary are more profound for each consecutive stage. Hence, further guidance in the design and selection of business processes would be helpful to implement the strategic options suggested. Another main requirement is the integration of the new Web based applications with existing business information systems. Therefore, in order to further substantiate the guidelines it would be helpful to indicate – with respect to relevant processes – where additional information systems need to be implemented and in which way they have to be integrated with existing systems.

The majority of the suggested strategies requires a perspective crossing departmental or even company boundaries. Employees of different units and different individuals with varying background and experiences need a mutual language in order to be able to cooperate and communicate. Conceptual models can serve as mediator and as a mutual language. For example process models are very helpful for business process analysis and design (see [FrLa03]).

The discussion of necessary initial investments for implementing the different strategies has pointed out that business process analysis and modelling can be

very time and cost intensive. In order to decrease these expenditures general reference models can be utilized, that present basic processes and data models of communication and interaction with customers (or suppliers) over the Internet. In the context of the ECOMOD project a library has been developed describing typical procurement processes. Additionally, the challenges of methods for adapting reference processes for a specific business case have been discussed and a pragmatic solution approach has been suggested (see [LaFr02], [FrLa02]).

General process models, which describe fundamental steps, for example, necessary to achieve the different evolutionary levels, can also be developed independent of a particular company (see [LaFr03]). Reference and process models allow minimizing the expenditures necessary to implement the various strategic actions and in this way making their utilization economically feasible for SMEs. Here, the approach of flexible and adaptable E-commerce application is an important starting point (see [Fran01a], [FrLa02]).

Apart from the complexity of presenting dynamic structure in E-commerce, another challenge involves the modelling of static concepts, such as product information, product specification and customer data. The difficulties of modelling product information have already been discussed and a solution approach has been suggested in the context of the ECOMOD project [Fran02]. Apart from product modelling, choosing the appropriate communication standard is a critical success factor for most of the suggested strategic options. It would therefore be useful, if central criteria for assessing standards and standardisation initiatives for business documents, interaction protocols, and product descriptions could be identified. Initial approaches can be found in [Fran00] and [Fran01b]; however, these approaches need further refinement and consideration of the specific conditions and requirements of small and medium sized enterprises.

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