

# **E-Service Pricing: State-of-the-Art Analysis and Requirements Mapping**

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## **Abstract**

In recent years the economic impact of services that are either based on or designed for technological artifacts, so-called e-services, has risen. An often neglected issue in this context is the quest for appropriate pricing strategies and associated methods and instruments for determining the price of these e-services. This paper presents the results of an empirical analysis of e-service pricing in Austria. The empirical research has been conducted in a mixed method approach in order to obtain a quantitative overview as well as a qualitative in-depth insight into the state-of-the-art. Results indicate a significant lack of usable tools that meet the needs of small and medium enterprises and are appropriate for e-services or services at all. Moreover a set of requirements, both technical and methodological, could be derived for e-service pricing tools that support and are accepted by small and medium-sized enterprises that struggle most when it comes to define and implement pricing strategies for their e-service portfolio.

## **Keywords**

Pricing; e-services; SMEs; value assessment; value-in-use; value-in-context

## 1. Introduction

E-services are gaining more and more importance in modern economies. The broad variety of e-services on the market necessitates a broad definition of e-services. The term e-service thus comprises services that are either based on information technologies (IT) or designed for IT. Examples for the first form reach from mobile payment services to car-sharing platforms, and the second kind includes server administration as well as printer maintenance. Nowadays e-services are not only provided by dedicated software companies but enhance the bundle of offered goods in many branches. Moreover, e-service are not only provided by huge companies, small and medium-sized enterprises (SME) are also prompted to offer e-services in addition to their core business. Their importance is increasingly independent from the economic sector in which the company operates.

Available pricing tools are rarely usable for SMEs or are not appropriate for e-services due to their specific characteristics. Usability for SMEs largely depends on the methodological and technical implementation of pricing tools, e.g. process cost accounting requires standardized processes and exacts data concerning average cost per process step. This fact hampers application in the SME sector even though it might be an appropriate tool for larger companies with a more elaborate cost accounting. Many concepts and tools that aim at value-based pricing were developed for product pricing. The transferability to services is questionable as services are intangible and often lack clearly demarcated features, which are necessary for e.g. traditional conjoint analysis.

The main objective of this research is thus a thorough analysis of existing approaches with regard to their applicability on SMEs and e-services and a mapping of the particular requirements in order to obtain a basis for the development of a pricing tool that fulfils both the specific needs of SMEs and the particular challenges of e-service pricing. An empirical study, containing quantitative and qualitative elements, is conducted to obtain data from enterprises in different branches and sizes. This procedure ensures the appropriateness of the final artefact for SMEs. Moreover, the qualitative study is conducted in the field of service-oriented companies in order to define a best practice benchmark.

The remainder of this paper is organized as follows. In section 2 the existing pricing methods and tools are outlined and the state of the art is analyzed. Section 3 provides detailed information regarding the methodology of the empirical research. Results of both studies are presented and discussed in section 4. Section 5 provides conclusions from the state of the art analysis and the requirements mapping, and gives an outlook on the pricing tool to be designed.

## 2. Pricing Methods & Tools

The interplay of price and value is a widely studied phenomenon in the focus of several disciplines. Classic theories of demand discuss effects of prices on demand and thus on value (Pindyck & Rubinfeld 2012). Marketing research on the other hand focusses on value perceptions (Sweeny & Soutar 2001), which are influenced by prices in form of a value-for-money trade-off. The opposite effect of value on prices is researched within the concept of willingness to pay that is based on the idea of exchanging money for perceived benefits (Zeithaml 1988).

In the context of services the relationship of price and value is embedded in the concept of value-in-use (Vargo & Lusch 2008) or value-in-context (Löbler & Hahn 2013). Both consider

the specific characteristics of services in their approach towards value. Value-in-use focusses on the service delivery process in the course of which the service value is generated, whereas value-in-context focusses on the heterogeneous outcome of the process due to context factors that influence it.

## 2.2. Value-based concepts

Value-based concepts play a role in various scientific literature and related business areas (Keränen 2014). The understanding of value in neoclassical economic theory and classical pricing theory, for example, is derived from maximizing the utility and minimizing costs of a consumer as a rational decision-maker with perfect information (Woodall 2003). Thus value is interchangeably used with “utility”. In contrast in prospect theory, as part of behavioural economics, value is derived from relative gains and losses, instead of final outputs for the consumer acting under “bounded rationality” (Kahneman & Tversky 1979). The value concept in the context of behavioural economics and behavioural pricing is thus determined by different psychological theories (Homburg & Koschate 2005).

As already mentioned, value-based approaches in the field of consumer marketing literature include concepts of the perceived value. In this area, there are various concepts, which have in common that value is preferential, perceptual and cognitive-influenced; it is considered relative, comparative, complex and requires interaction between consumer and service or product (Sanchez-Fernandez & Iniesta-Bonillo 2007). Early research in customer value conceptualize perceived value as uni-dimensional. This uni-dimensional conceptualization of value is primarily characterized by a simple and utilitarian perspective, whereby various authors contribute to this research stream (e.g., Zeithaml 1988; Grewal et al. 1998; Dodds et al. 1991; Cronin et al. 2000; Beneke et al. 2013). One research stream is based on price studies and understands value as a quality-price relationship (i.e., trade-off between quality and sacrifice) Here, the value and quality of a product or service are influenced by the price (Sanchez-Fernandez & Iniesta-Bonillo 2007; Zauner et al. 2015). Another approach is the Means-End Theory, in which the perceived value corresponds to the achievement of a goal through the use of products or services as a means, whereas the use includes an evaluation of perceived positive and negative consequences; (i.e., trade off between benefits and sacrifices) (Sanchez-Fernandez & Iniesta-Bonillo 2007; Seeringer 2011). Based on the means-end-theory Zeithaml defines perceived value as “overall assessment of the utility of a product based on perceptions of what is received and what is given (Zeithaml 1988, p.14). In contrast multi-dimensional conceptualizations have developed, which have prevailed above all. These multi-dimensional value-based concepts are characterized by a complex construct of perceived value, considering not only economic and cognitive (rational) aspects but also affective factors (Zauner et al. 2015; Sanchez-Fernandez & Iniesta-Bonillo 2007). Research that belongs to this multi-dimensional conceptualization is Holbrook’s (1999) “typology of consumer value”, which is based on three dimensions of customer value that result in eight types of value (efficiency, excellence, status, esteem, play, aesthetics, ethics and spirituality) (Holbrook 1999). Secondly, there are utilitarian and hedonic value constructs (e.g., Babin et al. 1994; Babin & Attaway 2000) and thirdly there are multi-dimensional constructs in the context of the consumption-value theory assuming that value includes a functional, social, emotional, epistemic and conditional value (Sheth et al. 1991). Many other authors contribute to the consumption-value theory by investigating it theoretically and empirically (e.g., Sweeney & Soutar 2001; Parasuraman et al. 1985; Chahal & Kumari 2012).

Another aspect of value is given in the business marketing literature. This literature is characterized by two perspectives of customer perceived value: (1) value of goods and services or value-in-exchange and (2) value of buyer-seller relationship or value-in-use (Lindgreen & Wynstrab 2005, Grönroos 2008). In the first perspective, customer benefit is considered as embedded in products and services and can be divided into core and additional services (Lindgreen & Wynstrab 2005). According to Kotler (2003), customer value is the difference between benefits (i.e., performance and quality of the offer), price (i.e., purchase price) and costs (i.e., costs related to ownership such as maintenance costs but also psychological costs). In contrast, in the second perspective the perceived value not only includes the product or service but also the relationship between customer and supplier (i.e., the value of the commitment from both parties) (Ravald & Grönroos 1996).

The concept of customer value as (perceived) value of a product or service from the customers perspective has to be distinguished from the concept of customer-lifetime-value or customer equity. These latter terms define the value or attractiveness of the customer from the provider's point of view. Another concept, which considers value from the company's perspective is the value proposition (Koller et al. 2012; Scheuss et al. 2016). Thus, it is more about what is the customer's value for the business (Magretta 2002), then the perceived value of the customer. The value proposition is defined as the offer created and delivered to different customers (Wouters & Kirchberger 2015). The definition of the value proposition is at the core of business model approaches and determines the value-added process (Scheuss et al. 2016).

### 2.3. Value assessment

Value assessment is critical for a number of business decision areas like product development, value audits, pricing capabilities, marketing strategies or the competitive strategy of a company in comparison to its major competitors (Anderson et al. 1993). Despite the importance of value assessment, there are several challenges and open issues. Therefore questions arise such as how can this process of evaluating and communicating the value created for (and with) customers be assessed (Payne & Frow 2005; Sawhney 2006)?

In consumer markets, customer value assessment methods are usually closely related to the measurement of customer satisfaction and service quality (Payne and Holt 2001). This is in line with utility theory, which assumes that consumers make buying decisions to maximize satisfaction gained from purchased products and services (Bowman & Ambrosini 2000). Therefore, customer satisfaction surveys (e.g., Mittal & Kamakura 2001) and standardized tools like SERVQUAL (Zeithaml et al. 1996) and PERVAL (Sweeney & Soutar 2001) that measure the expected and perceived quality of services are the key methods to assess value in consumer markets. The disadvantage of measuring customer value in the form of unidimensional or multidimensional constructs in quality or satisfaction surveys is a non-monetary value assessment. In the concept of exchanging money for perceived benefits (Zeithaml 1988), methods for measuring the willingness-to-pay are applied to monetarily quantify the customer value. Such methods are based on market data, experiments as well as indirect and direct surveys (Breidert et al. 2006; Woratschek & Roth 2013).

In business markets Anderson et al. (1993) identified the following nine methods to assess customer value:

- *Internal engineering assessment:* Company experts estimate the customer value of new products and services by laboratory tests.

- *Field value-in-use assessment:* Customers are observed and interviewed during the process of actually using new offerings to obtain estimates of the overall value-in-use.
- *Focus group value assessment:* In this qualitative approach customers are exposed to new products or services and are then asked to evaluate the offerings.
- *Indirect survey questions:* Respondents are asked to assess small changes to existing offerings to indirectly infer customer value from their comments.
- *Direct survey questions:* Customers are asked to evaluate new product or service concepts to directly infer customer value from their reactions.
- *Importance ratings:* Customers are asked to indicate the importance of and satisfaction with a set of attributes or features of new offerings. The customer value is high if the perceived importance is high and the satisfaction is low.
- *Benchmarks:* Respondents are given a current industry standard and are then asked on their willingness to pay for certain additions of attributes to this “benchmark”.
- *Conjoint or Trade-off analysis:* Customers are asked to evaluate a set of potential offerings which consist of several attributes or features. The levels of these attributes are systematically varied within this set and the respondents provide a purchase preference rating for the offerings. Statistical analysis is then used to “decompose” these ratings into the value that the customers place on each level of each attribute.
- *Compositional approach:* Respondents are asked to evaluate the single components of the offering separately. The sum of these individual ratings leads to the value of the overall product or service offering.

In their empirical study Anderson et al. (1993) found out that focus group value assessments and importance ratings are the most popular methods among large U.S. companies, while conjoint analysis, though used less frequently, has the highest practical success rate. This has possibly to do with the fact that the conjoint analysis estimates a “part-worth” percentage for each attribute. This enables companies to know the relative degrees of attribute importance and to develop marketing strategies that emphasize the preferred attributes (Pergler et al. 2015).

Later, Anderson and Narus (1998) and Anderson et al. (2006) explored that best practice suppliers in business markets often use value case histories, value calculators, and customer value models to assess the value of their offerings. According to recent studies methods such as importance rating, value-in-use assessment, conjoint (or trade-off) analysis, focus group assessment and expert interviews and especially the combination of them are still important in respect to customer value assessment (Hinterhuber 2008).

Pilot projects can also be means to evaluate the value of new offerings (Hobday 2000). However, they require close cooperation with customers, whether it be in the form of beta-testing or in the form of trial purchases or free samples:

Another widely employed method of assessing value is the total cost of ownership (TCO) analysis, an application of activity-based costing (Wouters et al. 2005). This is a strategic cost accounting tool that aims to calculate all costs of an offering over its full life-cycle (Ellram 1995). The life cycle costing concept can be seen as a transparent representation of the discounted benefits for the customer. From the customer's point of view the lifecycle costs capture all direct and indirect costs that are incurred over the life cycle of an investment determined by the buying decision. This includes the costs of acquisition, purchasing, operation, maintenance and end-use (cf. Heilala et al. 2006, cited in: Bode 2015, p. 651). From the marketing point of view, lowering life-cycle costs creates a communicable value. The value



for the customer does not arise from an increase in functionality but from the reliable delivery at the lowest possible total cost (cf. Bode 2015, p. 651).

#### 2.4. Value-based pricing

Pricing methods are procedures that firms use to calculate the price of their products or services. In theory as well as in practice, three basic pricing strategies can be categorized (1) cost-based pricing, (2) competition-based pricing and (3) customer value-based pricing. Cost-based pricing derives from cost accounting data (Hinterhuber 2008). The costs represent price floor and price ceiling as a minimum and maximum price for a specific product or service. Competition-based pricing methods consider the prices determined by the competitive firms and make price decisions based on competitive prices (Pergler et al. 2015). A purely cost-based or competition-based pricing is not sufficient in most cases, that is why marketing and pricing studies recommend value-based pricing as a modern and advanced pricing approach (Cressman 2010; Hinterhuber 2008; Nagel & Holden 2002; cited in: Liozu et al. 2012). The implementation of value-based pricing strategies considers how customers perceive value and what they value in products or services (Ulaga & Eggert 2006).

Customer value-based pricing is increasingly recognized in the literature as superior to all other pricing strategies (Ingenbleek et al. 2003, cited in Hinterhuber 2008). This pricing approach uses the value that a product or service delivers to a predefined segment of customers as the main factor for setting prices (Hinterhuber 2008). Dholakia (2016) suggests four steps for value-based pricing which includes the focus on a single market segment, the comparison with next best alternatives, the understanding of differentiated worth and last the allocation of a dollar amount on the differentiation. The advantage of customer value-based methods is that the customer perspective is taken into account but disadvantage is that relevant data are more difficult to obtain and interpret (Hinterhuber 2008). Thus, Hinterhuber (2008) explored that the difficulties in making value assessment is the primary obstacle for companies to implement value-based pricing strategies.

In the context of a value-based pricing strategy there are different approaches to quantify value in comparison to competitors, whereby the focus lies products or services and their attributes (Stoppel & Roth 2016). Two approaches are discussed for quantifying the value and the differentiation from the competition: Customer Value Mapping (CVM) and Economic Value Mapping (EVM) (Johansson 2013).

The customer value map can be used to quantify customer benefits. This instrument illustrates how customers estimate the perceived value relative to the perceived cost of products and services (Monroe 2003, cited in Ahlert et al. 2008). Thus, the CVM displays how customers perceive the price-performance ratio of an offering in comparison with its competitors (Hallberg & Andersson 2013). Customer value maps are developed on the basis of market research data, whereas customers must state whether the acquisition would be a beneficial business for them or not. Therefore, performance components are assessed and combined into an overall assessment, taking into account their weighting (Stoppel & Roth 2016). Similarly the determination of the perceived costs is assessed, which include the price but can also include non-monetary costs. By mapping perceived value and costs one can instantly see how competitive an offering is positioned and if the perceived value is higher than the perceived costs (Ahlert et al. 2008).

The Economic Value Mapping method, which compared to the CVM, considers a different value assessment between standardized and differentiated products or services (Stoppel & Roth 2016). The economic value consists of two components: The reference value of the performance

results from components that also contain the next best alternative. The value of the differentiation criteria is added to or subtracted from this value - depending on whether one's own performance has an advantage or disadvantage in this respect (Hinterhuber 2004). This value should be perceptible to customers, quantifiable and associated with a willingness to pay on the part of the customer (Anderson et al. 2010). The underlying concept is the Economic-Value-to-the-Customer (EVC)-method. Here the customer decides for the alternative which donates the largest value contribution. If a positive value contribution can not be achieved with any alternative then the customer will completely decline a corresponding investment. The value contribution can be determined using the net present value method (Wöhe & Döring (2002), cited in: Karger (2011)). The costs associated with a customer's product/service are forecasted over the life cycle. The life cycle costs include the start-up costs, the costs of the operation and the purchase price. Start-up costs are those costs that are not included in the purchase price but must be paid by the customer. In order to calculate the EVC the so-called "improvement value" has to be considered. This is the amount in terms of monetary units by which a product exceeds the reference product of a competitor. For example an improvement value may be due to product features or product-related services that the other setup does not offer. This will make two competing offers directly comparable. From the customer's point of view the EVC is composed of the reduced life-cycle costs and the higher value added (improvement value) compared to the competition. This is the theoretical maximum price a customer is willing to pay (Ahlert et al. 2008). From the supplier's perspective the EVC is composed of the addition of its own costs and the advantage in comparison to the competitor. The competitive advantage is the decisive factor for pricing. This can be shared between the bundle provider and the customer by saving the customer's lifecycle costs compared to the competitive offer and enabling the supplier to achieve a higher price on the market. For the determination of the costs among other things the process cost accounting and profitability analyses are suitable (Ahlert et al. 2008).

In the broadest sense, target costing could also be used as an instrument regarding customer value into account. Target costing is a strictly market-oriented approach to cost planning, cost control and cost controlling (Kremin-Buch 2007). In opposite to conventional costing methods such as cost plus methods, target costing has a top-down approach (Horváth 2009). The market price represents the starting point of the target costing. Not the costs are influencing the price in a retrograde approach but the price that can be achieved on the market is influencing the costs in a progressive approach. The entire value chain is aligned with the target variable "target price". Target Costing is carried out in four steps (Horváth 2009): (i) determination of the total target costs, (ii) target cost splitting, (iii) target cost achievement, and (iv) target cost controlling. The third step is very important because it is the translation of customer requirements into product/service features. It is necessary to use resources in a way that corresponds to the product value relations desired by customers (Horváth 2009).

Summing up customer value-based pricing should be seen as a process: (i) First the company determines customer needs and value perceptions. (ii) After that it defines a target price based entirely on customer perceived value. This target price and value will then (iii) determine what costs the firm can incur, as well as about the resulting product design (Claessens 2015).

### 3. Methodology

The applied methodology in the inquiry of this study is a concurred triangulation strategy as one of the several mixed methods models/designs. The design is characterized by a concurrently conducted quantitative and qualitative research approach, with the aim to align the two collected databases. The advantage of this research strategy is the clearly defined separate procedures, which complement each other. Consequently, weaknesses of one method are balanced by strengths of the other method (Creswell 2009).

### *3.1. Quantitative survey*

In order to identify the status quo and future developments of service pricing in Austria, two empirical studies were performed from June to July 2017. On one hand the top companies from Austria with the highest sales were analyzed assuming that they already have a wide range of pricing tools. On the other hand an analysis of the SMEs was conducted, since the Austrian economy is dominated by small and medium-sized enterprises: 99.7 % of all enterprises in Austria are SMEs that generate a large proportion of the total turnover and gross value added (Federal Ministry for Digital and Economic Affairs 2016). Both studies focus on industry and commerce.

For the determination of the population for the first survey the ranking list of the TOP-500 Austrian companies created by the journal “Trend” in 2016 was used. The ranking is based on the annual turnover from 2015. In a first step the service sector was removed from the list with the exception of companies with industrial character in the service category. Further banks, insurance companies, tax consultants and accountants were canceled as well. Finally, holdings with less than 1000 employees were removed from the list since they might have been founded only for economic or tax reasons. This results in a population of 466 companies.

The second survey includes small- and medium-sized enterprises in Austria. The definition of enterprise sizes was given by the recommendations of the European Commission. The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ less than 250 people and which have an annual turnover that does not exceed EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million. (2003/361/EC, Article 2). Microenterprises with less than 10 employees and an annual turnover and/or annual balance sheet total that does not exceed 2 million EUR do not belong to the target group. Large enterprises with more than 250 employees and an annual turnover exceeding EUR 50 million and/or an annual balance sheet exceeding EUR 43 million were eliminated as well.

The next step was to filter sectors that are not part of the trading or industrial sector. Enterprises which belong to the service industry were eliminated. Also banks, insurance companies, rentals, freelancers, health institutions and health care (except sales and production), chambers, publishers, all educational institutions, old people's homes, offices and authorities, public institutions, repair and service providers, affiliates, funeral directors, libraries, catering, television and radio companies, clubs, gambling companies, air carriers, carriers, agencies, various offices (e.g. business office), institutes, tourist accommodation, cultural and sports operators, marketing companies and various service providers (e.g. courier services) were removed. Taking these parameters into account 5,822 companies were part of this research.

In the present study random sampling was taken for selection procedure. One subset of the population was collected from which each of the subsets had the same probability of being drawn.

For the TOP 500 companies the return-related sample is 79 subjects. This gives a net return of 37.44% based on the simple random sample and a fluctuation of 11.03%. 97.5% of those



companies who started to respond ended the survey. The actual return-related sample of SMEs who completed the questionnaire is 178. These 178 companies reported a net return of 4.44% based on the simple random sample. This number has a fluctuation of 7.35%. 80.2% of those companies which started the questionnaire completed it.

The survey tool was a standardized questionnaire which was sent out via "Survey Monkey". The questionnaire includes 31 (TOP 500) and 28 (SMEs) questions on among other things the current pricing of products and digital services, a desired tool to support pricing and general demographic data. In the design of the questionnaire mainly closed questions were used, except the question about the general understanding of digital services. For some questions multiple answers were possible.

### *3.2. Qualitative interviews*

Besides a quantitative survey approach, a qualitative research design was applied for cross-validation of data (i.e. integration or comparison) in the course of results interpretation. The qualitative research strategy includes semi-structured expert interviews with the aim to collect data and qualitative content analysis in order to analyze data. In total 17 guided qualitative interviews were conducted with experts in the field of after-sales-services from June to September 2017. The interviewees are employees of 17 companies, which belong to the Styrian Service Cluster (Styrian Service Cluster 2018). This cluster is an association of companies in the federal state Styria in Austria. Most companies within the cluster are in the field of machinery and plant engineering and only five companies are in the service and commerce sector. The Styrian Service Cluster is characterized by the common strategy of Service 4.0 development, which is connected to the concept of Industry 4.0/smart factory. The companies in the Styrian Service Cluster represent a leading association in the field of digitalization and service innovation. Therefore, cases were selected via a purposeful sampling strategy, i.e. information-rich cases that manifest the phenomenon of e-service pricing intensely were selected to collect data (Patton 1990). In addition, the interviewees as employees of the after-sales-service represent the relevant experts within the companies due to their relevant knowledge and experiences in the application and pricing of e-services (such as remote services) and, thus, have the institutionalized competence to structure reality (Bogner et al. 2014). As the purpose of the interviews was to get a deeper understanding of how e-services are priced and which pricing methods or tools are used the interview guideline includes questions about (i) the e-service offering, (ii) the e-service pricing strategy and process and (iii) the ideal pricing tool expectations. In addition, the interviewed persons were shown different pricing methods or tools on cards and asked whether these are known or in use to price e-services. The requested pricing methods or tools were selected based on an expert assessment within the project team including accounting tools, customer value assessment methods from the consumer market literature, marketing methods and business model literature. Open-ended questions predominate the three guideline parts, whereas probing aims to gather an extended and coherent data base. Except two interviews, which were conducted via Skype, all other interviews were conducted face-to-face and lasted on average about an hour. In one case, the interview was conducted jointly with two actors. In all other cases, respondents were interviewed individually. All interviews were recorded and transcribed. Data analysis was done by applying qualitative content analysis according to Mayring (2010) using the software tool MAXQDA 11. Qualitative content analysis was used to structure and summarize verbal material from the interviews according to the rules of inductive category formation. Based on

the material and relevant research questions the process model of summary was applied to conduct the content analysis in a systematic way.

## 4. Results & Discussion

The Austrian surveyed companies give top priority to “e-service”. More than 60% of the surveyed SMEs and marginal under 90% of the TOP 500 surveyed companies regard digital services as important to their business and their customers. 78.0% of the small and medium-sized enterprises in Austria that have been surveyed offer digital services as well as 93.7% of the surveyed TOP 500 companies. The TOP 3 electronic services offered in Austria are website, online contact / appointment request and social media. 37.1% of the surveyed SMEs and 38.0% of the surveyed TOP 500 companies plan to offer (more) digital services in the future.

According to the qualitative interviewees, the e-services offered by the companies range from classic digital services as an add-on to the core business (e.g., website, mail, online customer support, webshop) to more or less advanced smart services (e.g., remote service, predictive maintenance, data analytics, apps, platforms). Companies in the field of machinery and plant engineering placed the remote service as the primary e-service in the foreground of the interview.

### 4.1. Usage of pricing tools

Most of the digital services are provided free of charge to the customers. However, only 36.5% of TOP 500 companies and 32.4% of SMEs allocate the costs on the products - mostly in the form of rates. The large enterprises argue that the costs are covered by product profits. Furthermore, they are not aware of the price and therefore the costs are not allocable.

The qualitative survey shows that the pricing approach and thus the application of pricing tools is dependent on the implemented type of e-services. None of the interviewed persons mentioned to charge classic digital services in their company. In total only 9 out of 17 companies charge their remote services or other smart services in the after-sales, whereas three additional companies plan to charge their remote services in the near term. Reasons for the fact that e-services in the area of maintenance and support are free of charge include generation of customer loyalty, the acquisition of new customers and additional market shares and the stimulation of spare parts sales. *“When we started [with remote service], everything was free of charge, considered as an additional support with the aim of a good sales argument.”* (Interviewee 9) Companies in the field of machinery and plant engineering in particular offer their e-services free of charge or have offered them free of charge in order to establish e-services and offer new business models based on them, which are then to be priced.

One of the aim of the quantitative survey was to find out which of the selected instruments and procedures for customer value analysis, cost accounting and pricing are known and used by the top-selling companies in Austria. The three best known instruments are overhead calculation (89.9%), target costing (73.4%) and life cycle costing (70.9%). This order is reflected in the use and satisfaction of the methods. For the TOP 500 companies surveyed (82.3%) the most important pricing tool is the overhead calculation. 58 companies are very satisfied or satisfied with this method, only 7 companies are less satisfied.

Target costing was named as the second important tool. 24 companies are very satisfied or satisfied and only one is less satisfied with this pricing method. Life Cycle Costing is used by 14 companies; approx. 93% are very satisfied or satisfied. Other methods that take customer

value into account such as perceived value or consumption value are rarely used satisfactorily by companies. Only a few companies use other methods that take customer value into account such as perceived value or consumption value in a generally unsatisfactory way.

The qualitative results on the specific question about the individual pricing tools and methods illustrated on cards confirmed the low use of methodological tools for pricing e-services. Companies most often use cost accounting tools such as target costing and TCO. Both market prices and the above mentioned customer value are used as target prices in target costing. TCO is indirectly used in pricing in the area of e-services for process optimization in order to be able to argue the customer value. *"It's something that we use extensively in communicating the benefits."* (Interviewee 1) Furthermore, TRIZ, the business model CANVAS and the customer value map are applied by some companies. As for TCO analysis already mentioned, these three tools only play a role indirectly in the pricing process. The other tools presented to the respondents are not used in e-services pricing. The reason for this is that the tools are not known or perceived as inapplicable for the specific industry, e-service or B2B sector.

In general, the 17 qualitative interviewed companies describe their pricing approach as a calculation based on costs, which includes mainly the service charged by hour. Thus the predominant pricing approach of those companies which price their e-services is a cost-plus pricing on the basis of estimated working hours for fixed rates or actual working hours (refers especially to remote services). According to the interviewed companies Excel is the standard pricing tool to do the calculations. Furthermore, the majority of companies mentioned that in the calculation the customer value is considered.

In addition to the customer value, the interviewed persons mentioned that information about competitors in terms of market prices is taken into account when determining the price. However, the collection of this information is hardly based on a systematic methodology. Some companies charge a certain fixed amount in the form of a basic fee. Other factors that determine the final price are individual customer factors (e.g., customer value, individual customer wishes) as well as price negotiations.

Summing up, the companies surveyed not only follow a cost-oriented pricing approach but also consider some market-oriented factors as determinants of pricing. Nevertheless, hardly any systematic methods are used for this and if they are used only indirectly and without a correct professional approach.

#### 4. 2. Knowledge of service value

The customer value is defined by the companies of the Styrian Service Cluster as the benefit that the customer receives through the e-service, i.e., reduced damage costs due to less machine downtime, reduced personnel and travel costs, savings in operating costs, profits through process optimization. The customer value is usually determined on an informal basis, i.e., through assessments based on customer discussions and experiences. Thus, one interviewee answered the question whether customers are analyzed using marketing tools: *"Not with a concrete concept, but in the customer evaluation, we ask what such a thing should cost"* (Interviewee 16) Only two companies named a concrete method, the total costs of ownership (TCO) analysis, to determine the customer value.

In the quantitative studies the companies were asked about their orientation when pricing new products or new digital services. Prices for new products are primarily determined according to prime costs plus profit margin – both SMEs and TOP 500. When it comes to

pricing, the subjects are furthermore oriented towards competition (64.6% TOP 500 and 55.6% SMEs) and experience (64.6% TOP 500 and 43.8% SMEs).

In determining the prices for digital services the customer value plays a greater role compared to the surveyed SMEs and the competition among the surveyed TOP 500 companies.

In both survey groups the general willingness of customers to pay is largely determined by the purchasing behavior in the past. After all, 24.7% of the surveyed SMEs do not know the willingness of their customers to pay. Only 2.5% of the surveyed TOP 500 do not know it. In 29.1% of large enterprises and 11.8% of SMEs the willingness to pay depends on active market research. In addition, 24.1% of the TOP 500 companies use analysis and forecasting tools or statistical models to determine the willingness to pay. These tools are only used by 10.1% of the surveyed SMEs.

32.9% of the TOP 500 and 38.2% of SMEs say they know customer value. But the majority of the companies surveyed (51.7% of SMEs, 60.8% of the TOP 500 companies) did not identify the reasons for buying or not buying. For 6.3% of the TOP 500 and 10.1% of SMEs, the product benefits are not known from the customer's point of view.

Although the classic method of overhead costing is the most widely used, it should be noted that some companies are already using tools that put more emphasis on customer value. However, the surveyed companies are not really satisfied with these methods. In addition, the companies surveyed claim to know the customer value, but how the customer value is specifically determined is not stated.

#### 4.3. Methodological requirements for e-service pricing tools

Just 6.8% of the interviewed large corporations are very satisfied with the procedure for calculating the prices. Another 48.6% of the Austrian TOP 500 are rather satisfied whereas 23% are rather not or absolutely not satisfied with the calculation of prices for e-services. 10.8% of the surveyed SME are very satisfied and another 49.7% are rather satisfied with the way how the prices for e-services are calculated. Only 12.2% of them are rather not or absolutely not satisfied with their e-service pricing.

Companies that are planning to offer more digital services in the future are, incidentally, not willing to integrate customers in the pricing of e-services. Only 30% of the large companies and 27.3% of the SME consider this measure to be appropriate. However, 60% of the TOP 500 and 59.1% of the Austrian SME do not want to integrate customers in their pricing.

As already shown in chapter 4.1, most digital services are offered free of charge at the moment. Also in the future only 12.2% of the large and 15.1% of the small and medium-sized enterprises plan to offer these e-services at cost. One of the reasons seems to be that the costs of digital services are already taken into account within the pricing process. 43.9% of the surveyed SME and even 52.7% of the Austrian TOP 500 rather or fully agree to this statement. Moreover 23% of the large companies are of the opinion that pricing is a lengthy procedure. Even 43.2% of the interviewed SME go along with this statement. This applies in particular to SME that are younger than 10 years. In respect to the qualitative interview results there are three main perspectives of pricing e-services in the after-sales area in future. One perspective is that of those companies that want to charge e-services in the future, whereas some of them are already doing so. Another perspective is that e-services will not be priced directly in the future, as they represent means to an end as stated by one interviewee: *“The decision that we will not charge the fleet management in the first step is a strategic decision. We said that we want to develop products based on this service, which will then cost something and which have defined a clear value.”* (interviewee 16) Thirdly, there are companies that still have too little

experience in the area of e-service and therefore do not really know whether they want to price it in the future.

Only 14.9% of the large companies from Austria rather or fully agree to the following statement: *“We are satisfied with the present pricing methods but we are open to a better procedure.”* There are more SME (46.8%) that agree to this statement. It is apparent that especially very young SME showed a high level of approval. 29.5% of the surveyed SME and only 10.8% of the Austrian TOP 500 indicated that they have an appropriate tool for the pricing of digital services. It is not surprising that 48.5% of the large companies that do not have an appropriate tool are not satisfied how the pricing for e-services are calculated at the moment. 60% of the large corporations are convinced that they can improve their pricing for digital services by observing the buying behavior. Furthermore, the acquisition of an appropriate tool and customer surveys (both 46.7%) seem to be helpful measures. Also the interviewed SME believe that observing the buying behavior (69.7%), customer surveys (48.5%) and the acquisition of an appropriate tool (27.3%) would lead to a better pricing for e-services.

#### 4.4. Technological requirements for e-service pricing tools (SH, 1,5p)

The technological requirements of Austrian companies are of great interest for the development of a suitable pricing tool. Table X shows which requirements are the most important ones and how many of the surveyed companies ranked a requirement as first priority:

	TOP 500	SMEs
Easy to use	46.7%	36.3%
Low acquisition costs	26.7%	15.2%
Low expenditure of time	20.0%	22.7%
Low personnel costs	6.7%	25.8%

Table X: Technological requirements for e-service pricing tools

It became apparent that the most important requirement is the fact that a pricing tool is easy to use. For 46.7% of the large Austrian enterprises this requirement is of highest significance. Next in rank are low acquisition costs (26.7%), low expenditure of time (20%) and low personnel costs (6.7%). The surveyed SME also prefer a tool that is easy to use (36.3%). This main requirement is followed by low personnel costs (25.8%) and low expenditure of time (22.7%). Interestingly enough the low acquisition costs (15.2%) for such a service pricing tool don't seem to be as important for the Austrian SME as the other requirements.

The assessment of statements regarding the ideal pricing tool for e-services revealed some major differences: For instance, 86.3% of the interviewed SME rather or even fully agreed to the following statement: *“It is important that a pricing tool has a well-balanced cost-benefit ratio”*. Surprisingly 90% of the TOP 500 companies strongly or rather disagree to this statement.

Furthermore 69.7% of the Austrian SME are willing to invest more time if their pricing can be improved thereby. Once again 90% of the large companies strongly or rather reject this statement.



Finally, 59% of the surveyed SME also would be prepared to invest additional money if this improves their pricing procedures. Even 93.3% of the large Austrian companies strongly or rather disagree to this statement.

It is obvious that the interviewed Austrian SME have a much stronger interest in a pricing tool for digital services than the large companies.

The results of the qualitative interviews show that companies have clear expectations about the requirements of an ideal tool for pricing e-services. First and foremost, the interviewees cited the availability of relevant data. In this context, the respondents commented on how an optimal data provision should work on the one hand and on the other hand on the required data type and its characteristics. Referring to the first, a tool would be desirable which collects data automatically, systematically and continuously in order to guarantee up-to-dateness and completeness of provided data. The advantage that companies expect from this is timesavings, for example in the preparation of offers but also flexible and dynamic pricing process. Automation is also mentioned in relation to structuring data according to certain categories such as customer or e-service groups. The collection of data refers to external sources (e.g., *“the tool would have to automatically extract data from the Internet” (Interviewee 1)*) and internally available data (e.g., *“every time you deal with the pricing topic you have to start the dialog again and if there is more transparency, an automated process, that would be helpful.” (Interviewee 7)*), whereas with regard to the latter, the need for data collection across business units was stated in particular with the aim to ensure coherence.

The type of data required includes data around three main points determining overall pricing strategies: costs, competition and customers. Data on costs for the provision of an e-service should in the first place represent actual costs, i.e., costs represented on the basis of Activity-Based Costing, and in the second place include planned costs. *“You have to have a good projection of costs, because I'm making a pricing for the future here.” (Interviewee 1)* Customer data should include information about the existing customers, their needs and purchasing behaviour, the customer relationship as well as informal customer contact data. The mentioned types of required customer data are in some cases already available, but lacks the aforementioned optimal data provision process to serve as a good basis for e-service pricing. For example, one interviewee talked about the existing customer feedback, but there is no mechanism that collects this data completely and systematically from different sources (e.g., sales person, marketing, technicians) across business units. Completeness of customer data refers also to customer information (e.g., offers, contracts, conditions) provided at one place. Another aspect mentioned was that the ideal pricing tool should be based on a value-based pricing approach and therefore information about the customer value is necessary. In respect to data about competitors, interviewees mention especially the need for data about market prices. In addition market data i.e., data about customers and competitors have to be comparable for the respective sector or e-service. According to the interviewees, the ideal pricing tool should therefore consider market data in the sense of benchmarking. This would reduce uncertainty in pricing due to a better understanding of market conditions, especially in the field of e-service pricing as a non-standard practice. To put it in a nutshell, the companies interviewed primarily expect an optimal database for the optimal pricing tool, because *“[...] more helpful than a tool that spits out an unvalidated number at the end of the day where I say, I believe this number once, is rather a kind of knowledge pricing or knowledge database that is now specifically applicable for me”.* (Interviewee 7)

Beside the focus on data provision and type of data required in respect to the ideal pricing tool, the tool should provide a basis for argumentation towards the customer and thus make the

customer value representable. *"That you say you have a good pricing method, where you say that is a standard method to develop a price, this is arguable even to my customer"* (Interviewee 17). This means that a basis for justifying the pricing process should be created in order to generate transparency in two ways. On the one hand transparency in pricing externally to the customer and on the other hand internally for the company itself. Thus the traceability of the pricing process should at least be guaranteed by the ideal pricing tool.

Another aspect that has been mentioned for an ideal pricing tool is the adaptability of this. Adaptability should be ensured in respect to technical aspects i.e., to the existing system, programs and structures. Interviewees prefer a tool, which shows system compatibility and uses pre-existing interfaces. *"So from my point of view it has to be integrable into our existing systems, i.e., I don't think it would be good to define an additional tool and if an additional tool then it has to ensure interfaces to our system"*. (Interviewee 16) Adaptability is not only mentioned in respect to technical aspects but also to the type of e-service. Consequently, e-services with a high service share but also e-services with a high material proportion as well as hybrid e-services should be priced with the tool.

Moreover, the ideal pricing tool was described as a tool, which provides a standardised framework with factors included that determine the price. It should be able to feed these factors with individual data. The framework itself is considered as a guideline or checklist that helps to keep track of possible factors and methods in pricing. The individual factors that influence the pricing should be illustrated by examples, indicators and empirical values. The aim is to provide an understanding of the relevance of determinants. *"It's about getting the understanding and just this checklist character, not to forget anything, plus this surprise effect where I say 'wau' the tool has made me aware of things I otherwise would not have thought of."* (Interviewee 3) To sum up, the ideal pricing tool should assist through the pricing process, whereby a user-friendly presentation is seen as an additional added value.

What was surprising was that respondents hardly mentioned any highly technical or digital features. Only one person mentioned that the pricing tool should contain algorithms or logic to automatically calculate a price. However, generally speaking, it was described a simple tool that is easy to use. In this context, examples such as Excel or an online calculator were given. These statements support the already mentioned desire for a pricing tool that above all creates understanding and an overview.

In summary: to design a well-functioning pricing tool, companies must involve the customer in the pricing process. Based on a functioning cost accounting, the customer value must be collected and taken into account in the calculation. The pricing-tool should be able to make the various data available quickly, easily and automatically. It serves as a basis for argumentation both for the customer and within the company. Of course, it should be universally applicable for all types of e-services.

## 5. Conclusion & Outlook

The results of the survey and the interviews have shown that e-services are important in companies and are therefore taken into account in their offerings. The offer ranges from classic e-services such as websites to smart services.

Although most surveyed companies regard digital services as important to their business and their customers, they mostly don't use methodological tools for pricing these e-services. Moreover, despite the important role e-services play in companies, they are hardly priced at all.

The costs of E-services are taken into account, e.g. in other products, but there is no clear pricing. Whether a price determination is carried out depends on the type of e-service and the corporate strategy.

Determinants of pricing are usually cost factors, which in turn is reflected in the pricing tools applied in the surveyed and interviewed companies.

The quantitative as well as qualitative results have shown that tools from accounting discipline in particular are used and known.

Although the customer value was stated to be taken into account, the understanding of measuring this in turn is based more on accounting tools such as TCO. This means that the measurement of customer value on the basis of consumer marketing tools or willingness-to-pay surveys hardly takes place. However, the companies surveyed do not wish to involve customers more frequently in the pricing process in this way.

Another result is that the companies surveyed are not very satisfied with the existing tools for pricing e-services. Companies want both methodical and technological requirements for an ideal pricing tool. In addition to aspects such as easy to use, low acquisition costs, low expenditure of time and low personnel costs, these also include the automatic and structured availability of customer, competition and cost data. It was also mentioned that an ideal pricing tool should provide a basis for arguing the price to the customer and that it should be adaptable to different e-services and technical requirements.

The empirical surveys show that a fundamental understanding of values can be assumed in companies. The task now is to collect data regarding different customer values and integrate them into the pricing process. The Austrian companies surveyed have a well-developed cost accounting system, so that the integration of customer value into the price calculation is the missing link.

It can be concluded that a pricing tool that fulfills the requirements of SMEs could boost the development of new e-services as they could also be profitable in future. At the moment companies consider e-services as important but with no immediate economic benefit. This could change when SMEs are provided with appropriate and acceptable means to define a reasonable pricing schema for their e-service offering.

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