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„eServices Business Value Assessment and its
Methods and Metrics Used Among the Companies“

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Abbreviation register

BEP	-	Break-even-point
BEQ	-	Break-even-quantity
BSC	-	Balanced scorecard
COG/S	-	Cost of good sold to sales
CV	-	Corporate value
CVA	-	Cash value added
DCF	-	Discounted cash flow
DR	-	Debt ratio
EP	-	Economic profit
EVA	-	Economic value added
FCR	-	First contact resolution
FR	-	Fulfilment ratio
GM	-	Gross margin
IC	-	Invested capital
ICTs	-	Information and communication technologies
IT	-	Information technologies
KPA	-	Key performance areas
KPI	-	Key performance indicators
MTBF	-	Mean time between failures
MTTR	-	Mean time to repair
MV	-	Market value
NA	-	Net assets
NE ^{BI}	-	Net earnings before interests
NOPAT	-	Net operating profit after tax
NOPLAT	-	Net operating profit less the adjusted taxes
NPV	-	Net present value
OEXP/S	-	Total operating expenses to sales
OGCF	-	Operating gross cash flow
OI/A	-	Operating income to assets

OI/E	-	Operating income to employee
OI/S	-	Operating income to sales
ROA	-	Return on assets
ROI	-	Return on investment
ROIC	-	Return on invested capital
ROS	-	Return on sales
ROSI	-	Return on security investment
RI	-	Residual income
SA	-	Service availability
SEO	-	Search engine optimization
SGA/S	-	Selling and general administrative expenses to sales
SSA	-	USA social security administration
SVA	-	Shareholder value added
SWOT-analysis	-	Strengths, opportunities, weaknesses and threats analysis
TBR	-	Total business return
VMM	-	Value measurement methodology
WACC	-	Weighted average cost of capital

1. Introduction

The era of information technologies (hereafter IT) has lead to a shift from exchanging goods to services and at the same time to a tremendous increase of companies operating in the field of electronic business. As continuous changes of the environment take place in this field, it is crucial for the companies to come up with new technologies and solutions on a regular basis (Oliveira et al. 2002). This complex condition leads to on-going development, adaptation and maintenance of eServices, which are seen as a central part of any electronic business activity due to their contribution to interactivity, connectivity, increase of customer satisfaction as well as mass customization (Sheth and Sharma 2007). Succeeding in these mentioned tasks guarantees long-term benefits for the companies, helps them to achieve their stated targets, as well as to retain a strong competitive advantage, which is of a great importance.

However, eServices need to be managed properly in order to really be a benefit for the company. One of these fundamental management tasks includes the continuous business value assessment of eServices, which is not only suitable for the calculation of the business value, but is also able to indicate, whether the eService contributes to the achievement of the company's key performance indicators and how well it performs. The assessment of eServices business value is conducted using appropriate methods and metrics, which lies the midpoint of this Master thesis examination.

1.1. Problem setting and motivation

There exist many different factors contributing to the success of online companies providing eServices. At the beginning the tasks planning and forecasting need to be conducted. Then it is crucial to create unique selling proposition, which can be broadly described as offering a different and better service when compared to the competition. A proper market research together with defining the target group seems to be essential as well. Although controlling activities need to be done both ex-ante and ex-post on a regular basis in order to remain successful, many companies are underestimating their importance.

Electronic Services are found in many different areas, such as eLearning, eGovernment, eBanking, eShops or eHealth care to name a few. This broad spectrum of offered eServices

is the reason why tailor made measuring methods and various measuring approached need be applied to capture their value in a correct and useful manner. Moreover, an eService can usually offer a number of benefits, such as cost reduction, greater geographic reach, flexibility or customer matched product variety (Boyer et al. 2002). As long as a company does not perform the evaluation of its own eServices, the whole Internet presence may end up with a failure, as the competition is only a click away. According to a study of eBay the benefits connected with an online business contribute positively to their survival rate. While traditional small businesses tend to reach a survival rate of 30-50 % after one year of starting the operations, online small businesses reach 60-80 %, which is still a quite low percentage (eBay 2013). This demonstrates the need for every company to be concerned with conducting proper assessment of business value, while using suitable methods and metrics. Underestimating this importance does not pay off on a long-term basis.

1.2. Aim and approach of the thesis

The first goal of this thesis is to come up with a terminological overview of differences between physical products, traditional services and an eServices together with the term business value. Furthermore, one of the prime tasks lies in developing a theoretical business value assessment framework for eServices together with its comparison to other chosen scientific and already developed assessment models. Both mentioned tasks consist of detailed descriptions and are supported by suitable eService examples where applicable. Then the theoretical specifications are supported by an empirical method that analyses all parts of the developed assessment framework in more detail. It is carried out using the SWOT-analysis, i.e. the analysis of strengths, weaknesses, opportunities and threats with regard to the business value calculation carried out through all parts of the assessment framework. Firstly, the four aspects are analysed for all parts of the developed framework separately and in general in order to show the possible differences between them and also a general suitability for the assessment of eServices. Secondly, the validity of the obtained business value results of all business value assessment framework parts is analysed as well and recommendations for the practical use are given.

In order to reach the goals of this thesis an extensive literature review is performed to deliver the framework of methods and metrics companies can use when evaluating

eServices. These findings are then used to conduct the SWOT-analysis to deliver a recommendation about the most appropriate eService business value assessment area.

1.3. Research questions

This master thesis focuses on answering the following research questions:

- What are the suitable metrics and models to be used for an eService business value assessment?
- Do any already developed frameworks for an extensive eService business value assessment exist?
- Are there any significant differences when evaluating eServices compared to physical products or traditional services?
- Is it possible to develop a solid framework of methods and metrics that can be used for the evaluation of eServices in general?
- What assessment tool application is recommended for companies to deliver the most valid business value of eServices?

1.4. Structure of the thesis

This master thesis consists of two main parts: theoretical and empirical part. The theoretical part is to be found in Sections 2 and 3, whereas in Section two the terms physical product, traditional service and eService are compared. Then the term business value is defined. Section 3 introduced the business value assessment in general and also presents an own-developed business value assessment framework for eServices together with findings in the field of business value assessment methods developed in scientific studies. In the Section 4 the SWOT-analysis of the developed business value assessment framework is carried out. Moreover, the research questions will be answered in Section 5. Finally the thesis concludes with a discussion and further research potential.

2. Terminology

The intention of this Section is to come up with a basic overview about the general terms, which play a central role in this master thesis. It contributes to a proper understanding of the problem examined in the following Sections. At the beginning, the term traditional service needs to be defined, as well as its differences when compared to physical products. Secondly, the same approach is used when defining eServices and comparing them to traditional services. Then also the term business value needs to be defined properly, starting with business value in general and closing with business value of traditional services and eServices.

2.1. Physical products vs. services

A good starting point, when comparing physical products to services, can be given by discussing their differences. First of all physical products are tangible, which means in more detail that they are three-dimensional and can be seen and touched. On the contrary this does not apply to services, which represent an intangible output. Moreover, physical products can be characterized by the homogeneity of perceived quality, whereas services stand out for their heterogeneity of perceived quality. The service quality evaluated by every particular customer differs depending on the customer's expectations, needs or previous experience. On the other hand, the quality of a physical product can be evaluated by using predefined standards and also before the potential purchase. Thirdly, a typical attribute for physical products is their separability. They are being produced without the prior specification of the end customer. Then marketing activities are carried out until the product is being consumed or used by the end customer. As providing a traditional service is only possible in the presence of the customer, the production, marketing and consumption of a service often fall together. Finally there is only the possibility of storing a physical product, not a service (Parry et al. 2011, p. 19-27). The discussed differences are summarized in Table 1.

It is crucial to underline at this point that the gross value as well as the number of employees in the service sector has risen radically during the last decades. The importance and the presence of companies working in the service sector are both gaining importance.

Table 1: Comparison of physical products to services

Physical product	Service
Tangibility	Intangibility
Homogeneity of perceived quality	Heterogeneity of perceived quality
Successive production, marketing and consumption, i.e. separability	Simultaneous production, marketing and consumption, i.e. inseparability
Storage possible	Storage not possible

Source: Own representation with reference to Parry et al. 2011, p. 19-27

2.2. Services vs. eServices

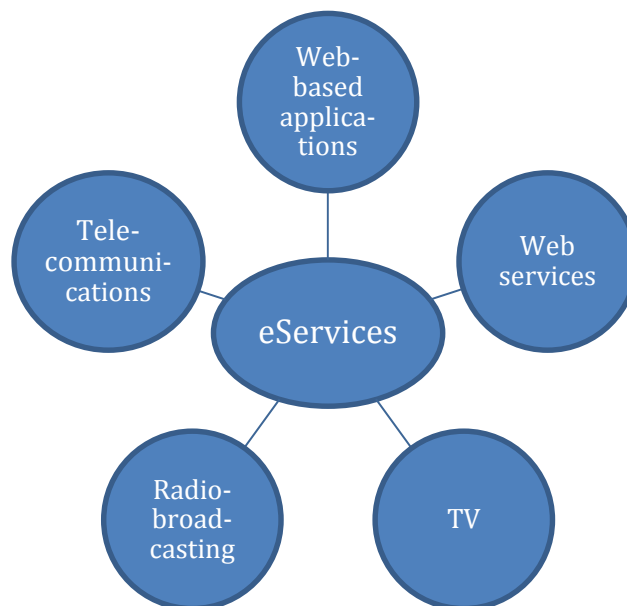
Together with the rise of information and communication technologies (hereafter ICTs), the traditional services have begun to shift towards eServices. Nowadays, a solid web presence is a must for most of the companies and organisations operating in the eBusiness field. In order to be successful, eServices should be developed in a flexible, effective and innovative way (Taherdoost et al. 2014). This is not only the case for business to consumer sector, but also for business to business, business to government, consumer to government and so forth (Janisch and Mader 2011, p. 1).

Generally speaking, eServices may be referred to as electronic supplied services, digital services or digital products. Thus, eServices can be defined as services being provided as well as delivered electronically with a high level of automation. One cannot take the advantage of using them without the IT. Besides of this, some kinds of eServices are provided only after a processed payment (Borec 2012). Furthermore eServices are not only considered to be all web-based applications, but also web services, TV, radio-broadcasting and telecommunication services (Aversano and Canfora 2002). The classification of eServices is presented in Figure 1. A popular example of a web-based application is YouTube, an application that is downloading parts of the service, i.e. videos, every time it is being used. A web service includes for instance the possibility to check an eTicket together with the time zone converter.

It is important to point out that there exist some common features of traditional services and eServices. First of all they are both intangible, as described in Section 2.1. Then they have a process nature, which means that a series of process stages need to be accomplished

to reach an output result. Also, they are both of an interactive nature (Taherdoost et al. 2014). Moreover their quality can be mostly assessed only after such a service was provided. But, there are on the other hand numerous factors that distinguish eServices from the traditional services. The first mentioned can be easily and quickly reproduced and distributed, while every eService copy is of the same quality. When desired one can also change and adapt an eService easily, which can be problematic when it comes to fraud. The initial production costs of an eService are usually very high whereas the average costs per item are decreasing steadily after more items are being produced or sold, which leads to increasing returns. For commercial eServices overcoming the critical mass is crucial for the on-going success. This is caused by the fact that the trust of end customers is increasing together with the increase of previously satisfied users (Laudon et al. 2000, p. 596-602)

Figure 1: Classification of eServices



Source: Own representation with reference to Aversano and Canfora 2002

Finally sServices are being used in several fields, such as eFinance, eGovernment, eBusiness, eCommerce, eMarket, eLearning, social networks, entertainment, eHealth care, teleworking and so forth. (Aversano and Canfora 2002; Lu et al. 2007, p. 1). There is a very high chance of implementing eServices to another areas as well, ending with eServices playing a central role in most facets of everyday life.

2.3. Business value in general

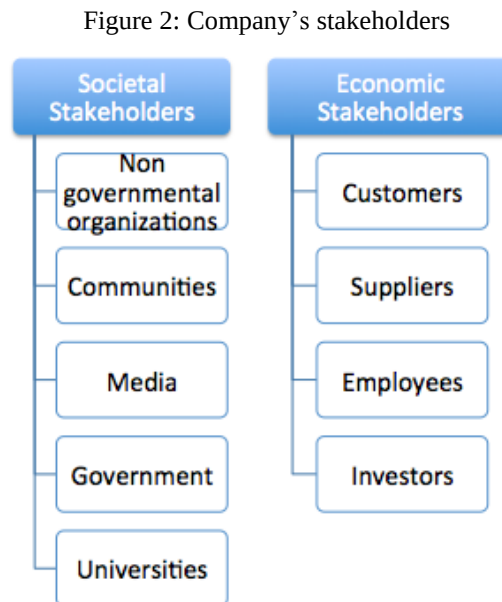
A business value, regardless whether the core of business are physical products or services, stands for all kinds of values created and accumulated as experienced by the involved stakeholders. The higher the business value, the better it is for the company in this particular instance. It might be beneficial for the company to reach a so-called goal driven achievement of business value. In order to succeed in this task it has to identify its stakeholders together with their desired targets. Then the procedure is followed by the definition of assessment tools for these targets and subsequently the selection of the most important ones, which are called business value drivers. During the company's lifecycle the focus should lie on them. A systematic assessment of the determined business value drivers should be a permanent task during the whole company existence (Van Cauwenbergh 2010).

Let's explore for instance the business value from the customers' point of view. The core of every business activity is the presence of the value proposition. It stands for the special features that create more value for the customers and differentiate the particular company from others. Subsequently, the customers prefer to buy from the company creating more value. The differentiation characteristics might be higher quality, better product design or longer product life cycle. Higher customer satisfaction is a good indicator for an increased business value as well (Laudon 2007, p. 59).

From the point of view of economic stakeholders the business value of suppliers and investor groups is also worth describing in more detail. The supplier business value can be delivered by systematic choices of suitable suppliers, necessary negotiations together with building long-lasting relationships. All of these interactions with the suppliers should lead to a maximum possible business value when carried out properly. The measurable indicators include for instance relationship duration, number of correct order fulfilments or costs saved. An increasing business value for investor groups can be ensured in several ways. The most important factor is the sustainability of a successful business activity. Some of the signs of a successful business activity might be increasing profits, decreasing costs, increased employee productivity or more satisfied customers leading to a higher demand. One can measure them for instance through the revenue growth, market share or profitability.

According to Laszlo et al. 2004 the influence of societal stakeholders has gained on importance during the recent years, while this trend will also tend to continue in the future. The successful business activity is therefore also conditioned by meeting their expectations. The powers of IT or globalization are the main enablers of the increased influence of societal stakeholders. Coping with an expected and exemplary behaviour, such as bringing efforts in environmental protection or maintaining human rights, brings an added value to the company. A negative performance in this area often spreads very fast and comes up with a damaged image of the company. In order to keep a positive image and increase the value, many companies are building partnerships with those societal stakeholders, which has been proven as a very effective strategy (Laszlo et al. 2004).

Every company with the ambition to generate a high business value should focus on stakeholders shown in Figure 2. The societal stakeholders are the so-called external stakeholders, who give value externally without being directly the part of the nature and purpose of the business. The economic stakeholders on the other hand are internal, whereas they are also the part of the value chain (Laszlo et al. 2004).



Source: Own representation with reference to Laszlo et al. 2004

To conclude, business value needs to be analysed from different points of view. It is generally not advisable to focus on a single element creating business value, but rather to analyse the stakeholders and their expectations from different perspectives. In the current rapid changing environments driven by globalization, shorter product life cycles,

technological progress, rise of the ICTs, environmental issues, market liberalisation, but also societal changes, a constant analysis of the own business value, focus on innovations and quick adaptations to changes are the keys to a long lasting company's success.

2.4. Business value of services

Until now, it has not been reached a consensus concerning the definition of the business value for services, as some authors see it only from a customer, while other from the company perspective (Bruhn and Hadwich 2014, p. 6). Other authors underline the importance of both perspectives including also the externally involved stakeholders (Laszlo et al. 2004; Jahn and Drengner 2014, p. 45-46). But, business value of services is in any case positively correlated with an economic success and attainment of a competitive advantage, which leads to an ensured existence of the company (Bruhn and Hadwich 2014, p. 6).

According to scientific evidence the business value for services is being defined mostly from the two first mentioned perspectives, i.e. the customer and company perspectives, which equal to the economic stakeholders' viewpoint. From the company perspective the term business value stands for measuring the company's success, such as the cost-effectiveness. The higher is the difference between costs and earnings, the higher is also the business value. The business value from the customer perspective reaches its peak when fully satisfying customer needs and solving their problems (Bruhn and Hadwich 2014, p. 7-10). Another studies are dealing with value creation from both, customer and company perspectives or involve into their examination also the power of societal stakeholders (Heskett et al. 1994; Jahn and Drengner 2014, p. 45-46). There exist several theoretical frameworks for all perspectives, which are examined in the following.

The service dominant logic, which is a part of the customer perspective, underlines that companies cannot deliver and create service value on their own. On a contrary, the most important and fundamental element for service value is the customer, who always acts as a co-creator of value. In this theoretical implication, companies can only provide value propositions. But only when the customer is accepting the proposition, creation of value takes place. Only he has the possibility to determine the value (Vargo and Lusch 2008). Some similarities of this model can be found in the so-called means-end analysis.

According to this theoretical framework the customers do not value the service according to the real quality or price, but according to their own perception (Zeithaml 1988). Based on the sacrifice-benefit theory the customer always compares the subjective value for the service with the subjective price. To be more specific, for a certain customer a premium service with a premium price set might not deliver the same value as a no-premium product with a lower price. This approach also presents the empirical findings of the customers' expectations towards value. For some customers value stands for a low price. Other customer groups see the value subjectively as a desired output that is worth buying. Then a third customers' group could experience value when buying high-quality premium services. However, all of the mentioned customer groups have in common that they experience value as the output they pay a certain price for (Bruhn and Hadwich 2014, p. 10-11; Zeithaml 1988). From the discussed studies, it can be drawn a conclusion that underlines the complications to capture, but also to measure the business value from the customer perspective due to the customers' heterogeneity. It is nevertheless crucial, as satisfied customers ensure a higher business value.

In the service profit chain the emphasis lays on both the company and customer perspectives. What is more, the centre of the business activity consists of targeting the customers' and employees' needs, which create success on a company level. The company may measure its business value for instance with profits, revenues or growth rates. But all of these indicators are directly influenced by the customers, to look closely by their loyalty and satisfaction. In the end productive, loyal and satisfied employees are closing the successful service profit chain (Heskett et al. 1994).

It is worth mentioning that the service profit chain became the target of many further studies, which focused on its empirical validity. Yee et al. 2011 conducted an empirical study in a number of physical service shops, where always two employees have been surveyed. Also customer and financial data were collected in order to prove the relationships between the indicators shown in Figure 3. All of the examined hypotheses were supported. To be more specific, employee loyalty is directly influenced by employee satisfaction and has a direct impact on service quality. Both service quality and employee satisfaction cause higher customer satisfaction. Then the customer satisfaction positively influences customer loyalty, which in turn increases the number of recurring customers.

Naturally, these increase the profitability of an enterprise and make the employees more satisfied (Yee et al. 2011; Balasubramanian et al. 2002).

Figure 3: Service profit chain



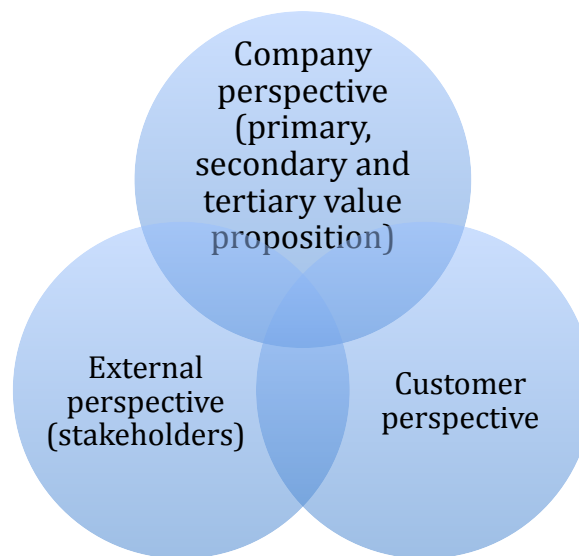
Source: Own representation with reference to Heskett et al. 1994

As already demonstrated in Figure 2, there exist several stakeholders in every company one should focus on when maximizing the business value. Also when examining business value of services, societal stakeholders are very important (Laszlo et al. 2004). For example communities are of a great concern. Consumers often take the value proposition of a certain company in order to get closer to people with the same interests. A service that has a high value for a community or a social group might also have a higher value for other consumers (Karababa and Kjeldgaard 2014). As analysed in the previous Section other external actors such as media, non-governmental organisations, government or universities are also influencing the business value of services. This can happen through the promotion of certain activities or products of that particular company. The image can be degraded by a negative propaganda, which in turn can decrease the number of customers and also revenues (Jahn and Drengner 2014, p. 46).

Finally, there are several studies belonging to the company perspective. But, the strong opinion that the companies are creating and determining value on their own, respectively that the value is being created through manpower exclusively, has been mostly replaced by the perception of a customer, who is in the midpoint of the value creation process (Jahn and Drengner 2014, p. 41). However, in some cases the company can still play a central role in value creation, which is mostly expressed in monetary terms. It influences the value of its own services by their development, design, production or delivery (Grönross and

Voima 2013). Attention should be paid at this point to three possible value propositions from the company perspective, i.e. primary, secondary and tertiary value propositions. The primary value propositions stand for the given non-branded service with its additions, such as insurance. A good example is a bank service offering a checking account. Then the secondary value proposition includes the brand giving the customer signals of trust or satisfaction. In our example it would mean opening a checking account in a bank with a strong brand name, reputation and perhaps also monetary coverage. The tertiary value propositions at last deliver any additional services e.g. through marketing campaigns, such as competitions or special offerings. In this perspective, the value is either directly economical, such as sales or revenues, or not directly economical, such as worth-of-mouth (Jahn and Drengner 2014, p. 42-43). The value triangle, which consists of all discussed perspectives, is illustrated in Figure 4.

Figure 4: Service value triangle



Source: Own representation with reference to Jahn and Drengner 2014, p. 47

To sum up, the categories creating business value are as follows: performance, company and customer. In the first category the quality of a service has a significant positive influence on the business value. The same effect has also the performance level of a service, continuous improvement and innovation. From the company's point of view several value drivers such as productivity, employees', suppliers' and customers' loyalty or reduced costs play an important role for value creation. When analysing the drivers for business value creation from a customer perspective, the most important are perceived quality and performance. Both factors differ among the customers because of their

heterogeneity. Because of this the perceived quality and performance from the customers' point of view are not the same as experienced internally by the company (Bruhn and Hadwich 2014, p. 18-19).

2.5. Business value of eServices

Although the business value of eServices can be partially analysed from the perspectives discussed in the previous Section as well, the range of the business value of eServices is much broader and differs from the business value of traditional services remarkably. This is caused by the existence of a very extensive range of different eServices, whereby some of them have characteristics that cannot be found in traditional services. For instance the consumer is mostly playing a central role. Nowadays every customer can choose from an enormous range of offered eServices anytime and practically everywhere due to the diffusion of mobile Internet devices. Furthermore, in the "virtual world" consumers can easily find the cheapest offerings and compare the suppliers. Also they can very easily get to information from other buyers and have thus currently the highest knowledge compared to the past (Band et al. 2013, p. 3-4). Today we live in the age of "prosumers", i.e. consumers acting also like producers. They provide feedback to eServices, which is in a consequence used and processed with the intention of introducing even better offerings. The term "better offerings" refers to eServices fulfilling the consumers' needs to a greater extent together with creating more value (Penkert and Eberwein 2013). More than that, enterprises have understood that an introduction of a market innovation specifically designed according to the customers' feedbacks is likely to substitute the currently used eService solution (Band et al. 2013, p. 3-4). In this Section four aspects with a direct impact on the eService business value creation are introduced. They include:

- customer perspective,
- customer interactions with the eService provider,
- stakeholders,
- internal business value creation.

First of all, as a result of the special eService characteristics, the value creation takes place mainly in the customer perspective. Thus primarily, the value is created by the customer and not by the company (Kuppelwieser et al. 2013). As an example, eServices of a social network or community character, such as YouTube, include very complex value creation

processes. They include countless interactions between the community members, who can either be service providers or customers (Kuppelwieser et al. 2013, p. 314-315; Kuppelwieser and Simpson 2014, p. 460-461). A portal with no community members and interactions would not create any value for the platform provider.

Secondly, in the eServices' field the interactions between the eService provider and the customer are typical. The customers act as very important partners in the value creation process, whereas the providers are able to support them in creating even a higher value (Grönross and Voima 2013). One typical example of value co-creation in eServices is a "comparison" portal. Here everyone can search for offerings and compare the cost-performance ratios. In this case the value is created in a traditional way, namely the provider of the website offers the opportunity to search the database and compare the offerings, while the value creation takes place when the customers make use of the service. When there is no customer interest, also no value is being created in this two-party relationship (Kuppelwieser and Simpson 2014, p. 460-461). Mostly the co-created value is the result of personalized offerings and exclusive experiences on the one hand, and revenue, learning and improved performance indicators on the other hand (Ahrar and Rahman 2012). Moreover, during the mentioned interaction processes there is the phenomenon of investing the so-called "operand" and "operant" resources. The first mentioned do not directly create value, but are needed prior to the value creation. In the case of an eService provider the operand resources include buildings with a server placement, hard- and software, funds and human capital. The operand resources to be invested by the customers include for instance time and money. Operant resources create value and are often intangible. They include for instance employee support on the provider level and PC knowledge on the customer level (Jahn and Drengner 2014, p. 44; Vargo and Lusch 2004).

The phenomenon of stakeholders already discussed in the previous Section, influencing the business value, is to be found also when providing eServices. Thus, they belong to the third group with a direct impact on the eService business value. Value propositions on social media are being shared and accepted between the users in order to belong to certain communities (Jahn and Drengner 2014, p. 46). Moreover, the boundless information on the Internet coming from media, social networks and another organisations are influencing the

buying behaviour directly, which also results in changes in the business value, depending on the character of these information.

Because of the discussed characteristics of eServices, it is almost not possible for the enterprises to create value only on the internal basis. They have to cope with high competition as well as deep customer knowledge. Thus, there is the need to focus on providing special features and functions for the customers (Jahn and Drengner 2014, p. 44). In the eService's field the differentiation characteristics might include higher security, reduced searching time together with lower searching costs, higher retrieval speed, reduced costs due to price comparing tools or eService customization. The focus needs to be on improving these characteristics in order to attract a wide range of customers and increase their satisfaction. Higher customer satisfaction is a good indicator for an increased business value (Balasubramanian et al. 2002; Laudon 2007, p. 59, 76).

3. Business value assessment

The goal of this central master thesis Section lies in identifying methods and metrics for the business value assessment of eServices. Companies should systematically analyse, whether the investments in eServices are paying off. Also the focus should consist of ensuring investment payoffs in the future (Barua et al. 2001). Business value assessment targets indicators and factors that are able to influence the future situation of an enterprise rather than predicting it. Moreover, it is proven that proper business value assessment leads to better investment decisions and improvement of performance indicators (Kryvinska et al. 2013). One of the reasons is the already mentioned element of finding areas that do not perform according to the company targets and thus should be the object for further measures. In addition being aware of the business value is of a great interest also for the involved stakeholders.

This Section consists of two main parts. First of all an overview about eService business value assessment in general is given. The Section starts with describing general steps that are to be followed prior to conducting the assessment. Then the general evaluation methods on an economic and non-economic level, but also internal and external level are presented. The first complexities of the business value assessment are shown in this part as well. To continue the business value assessment of eServices together with their specific assessment methods and metrics will be at the midpoint of the examination. The goal of this Section includes presenting an excessive own-developed eService business value assessment framework based on the review of already existing scientific contributions. The framework consists of four main parts: assessment of eServices features and functions, customer satisfaction, employee satisfaction and the economic indicators. This Section concludes with describing the most relevant eService business value assessment tools already developed and present in scientific studies. These tools open a possibility to complement the own-developed framework, as well as to shown the commonalities and differences between them.

3.1. Business value assessment in general

As the entire society went through a change up to reaching a knowledge economy, also changes in value during the last decades became more than apparent. The value drivers are

no more considered to be land, capital and labour, but instead information and knowledge. It seemed to be simpler to assess the business value of a traditional industrial economy, as putting more labour efforts and increasing the number of machines as well as improving their output possibilities was directly connected with a higher business value. The traditional transactions were mostly based on a single exchange of standard goods, which could be expressed on a monetary basis. But, the value of immaterial resources does not equal the value of material resources. Having a traditional service and putting more and more information into the person carrying it out does not automatically lead to an increased service output or performance. Moreover, the value in this case is a product of collecting unique kinds of information and delivering extra features in order to attract the customers. As far as the relationship towards the customers turned to be the value creator in the 1990s, repeated relational transactions took place. The value of these transactions depends for instance on price and knowledge exchanged (Bang and Cleemann 2010; Buschak et al. 2014, p. 96). The special characteristics of eServices discussed in Section 2.5 contribute to a variety of difficulties when trying to measure or model their value. The single IT component is not the value driver on its own, but only with interactions with the business environment (Lee 2001). For example, one can explicitly look at the IT investments into an eService, let's say YouTube. Increased investments in the application do not directly increase the business value of YouTube. Coming up with special features and innovations and most importantly attracting users, increasing their acceptance and interactions within the application are the key factors for business value in this case.

3.1.1. Business value assessment planning process

Generally speaking, the business value assessment planning process should consist of the following steps:

- Identifying and stating the business objectives
- Defining indicators that stand for achieving the objectives
- Identifying whether the data for those previously mentioned indicators are present or how and by which method they should be collected
- Determining the data analysis, result ranges for achieving the objectives, comparison benchmarks
- Keeping track of any company changes able to influence the results

- Classifying the amount of resources needed for the assessment process (Aspen Institute 2005, p.12)

It is of a great importance to consider the heterogeneity of every company in this planning process and implement it on a regular basis in order to be successful.

3.1.2. Economic and non-economic business value assessment perspectives

Depending on the business objectives, a company can perform the assessment process on an economic or non-economic/social level.

There exist a wide range of useful assessment tools for measuring the economic value. All of them are based on the understanding of a very simple and basic framework shown in Figure 5. The economic value is given by the difference between the customer willingness to pay and the costs for the offered item. An important factor is also the price set by the company. In the best case it should equal the customer willingness to pay. For example, in the case an offered item costs the company EUR 30,00 and the customer is willing to pay EUR 100,00 for it, the value created equals EUR 70,00. At the same time the difference between the price and the costs represents the producer surplus and the difference between the customer willingness to pay and the price the customer surplus. Typically, a company is using metrics and models based on these three indicators in order to improve the business value. Optimizing them is usually connected with improved results. They are expressed in monetary terms and are thus easily to compare (Tambe 2014a).

On the contrary the non-economic or social business value assessment is difficult to conduct, as it cannot be measured and quantified easily. That is one of the reasons why companies struggle to perform it on this level. There is a lack of theoretical frameworks that can be used for understanding and measuring the non-economic value of a company. More than that every company is unique and can provide different non-economic or social activities that are worth measuring and help it to differentiate from the competitors as well as increase its overall image (Tambe 2014b). *“Social value is created when resources, inputs, processes or policies are combined to generate improvements in the lives of individuals or society as a whole”* (Liu et al. 2008, p. 87). This is for instance more than relevant for companies providing eServices, as their need to differentiate is on a high level

and the competition is mostly very high. So in this sense the company can come up with increased quality (Stiglingh 2014), customer and employee satisfaction, increased number of social activities, which in turn can contribute to economic well-being, changes in the society or community relationships, but also to increased health, environment protection or employee satisfaction (Liu et al. 2008, p. 90-95).

Figure 5: Framework for economic business value assessment



Source: Own representation with reference to Tambe 2014a

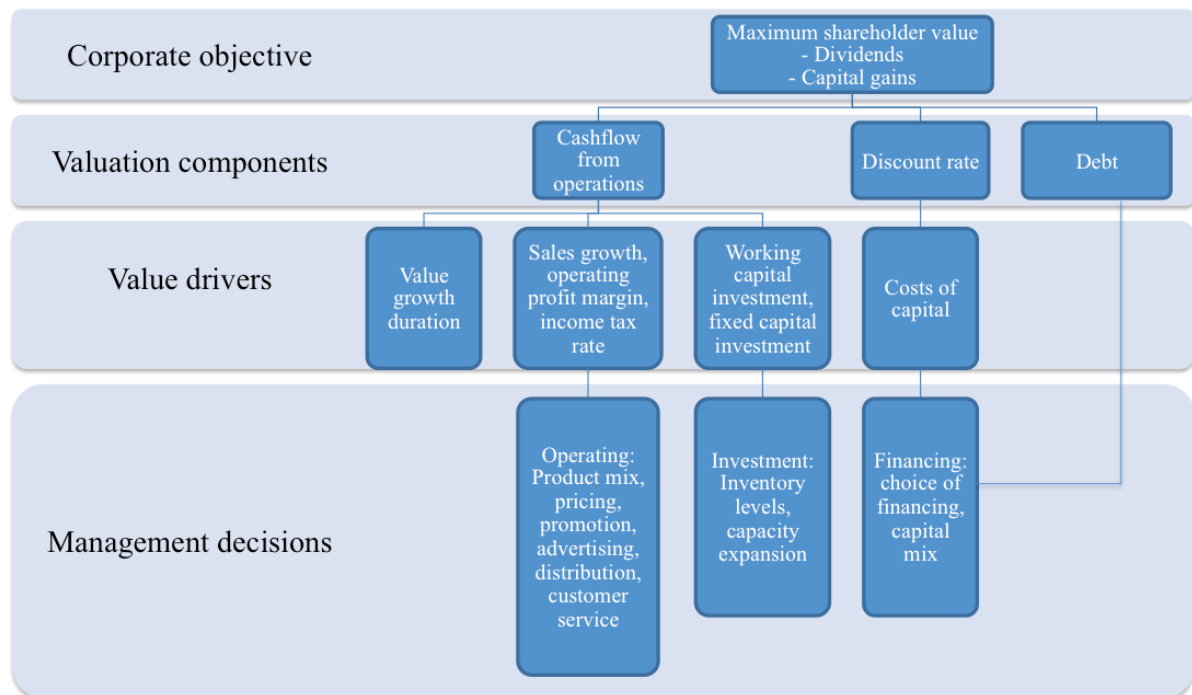
3.1.3. Economic business value assessment

According to scientific evidence, the main goal in the economic value based management is the maximization of shareholder value. It is given by stock returns, whose source is represented by dividends and stock price appreciations. Capital structure changes and share issuances are also taken into account (Holler 2009, p. 16). Figure 6 represents the process of shareholder value maximization.

As it can be seen from the illustration above, management decisions are the starting point of shareholder value maximization. Decisions in the fields of operations, investments and finances have a direct impact on the value drivers, which intensively influence the business value either in the positive or negative direction (Kazlauskienė and Christauskas 2008). Furthermore, it is important to choose value drivers that are measurable, repeatedly inspected and that the management can control and set targets for. A high duration of the value growth, sales growth, profit margins, low income taxes and ideal financial situation

have a positive impact on the operations' cash flow. But, also the costs of capital seem to be essential as they directly influence the discount rate. The maximum of the shareholder value is the product of operations' cash flows, optimal discount rates and debts kept low. These are the valuation components that are able to measure the company's value (Holler 2009, p. 17-18).

Figure 6: Maximizing shareholder value



Source: Own representation with reference to Holler 2009, p. 17

The number of valuation components shown in Figure 6 is only one of many possible evaluation approaches and is thus not yet complete. Series of value based performance metrics coming from traditional cash flow calculations include: discounted cash flow (DCF), shareholder value added (SVA), total business return (TBR) (Holler 2009, p. 30) and net present value (NPV) (Liu et al. 2008, p. 86). Other metrics focusing on earnings and profits include: residual income (RI), economic value added (EVA), economic profit (EP), cash value added (CVA) (Holler 2009, p. 30-31), return on investment (ROI) (Liu et al. 2008, p. 86), return on assets (ROA), return on sales (ROS), operating income to assets (OI/A), to sales (OI/S) and to employee (OI/E) (Zhuang 2005), gross margin (Barua et al. 2001), break-even-point analysis (BEP) (Kryvinska et al. 2010, Kryvinska et al. 2011) as well as net operating profit after tax (NOPAT). Furthermore Schryen analyses the performance metric productivity (Schryen 2010, p. 228) and Barua et al. 2001 presents

another performance metrics including order delivery cycle time and the number of incorrect order fulfilments (Barua et al. 2001). Metrics and models on an economic level also include the cost and expense perspectives, such as cost of goods sold to sales (COG/S), selling and general administrative expenses to sales (SGA/S), total operating expenses to sales (OEXP/S) (Zhuang 2005) or cost-benefit analysis (Kryvinska et al. 2013). Figure 7 illustrates all of the mentioned economic business value assessment metrics. Based on these generally used metrics, many scientists have developed economic value models, as well as metrics suitable for the evaluation of some particular areas of operations.

Figure 7: Economic business value assessment metrics

Cashflow based performance metrics	Earnings/profit based metrics	Expense based metrics	Performance metrics
- Discounted cash flow - Shareholder value added - Total business return - Net present value - Discount rate	- Residual income - Economic value added - Economic profit - Cash value added - Return on investment/assets/sales - Operating income to assets/sales/employee - Gross margin - Break-even-point analysis - Net operating profit after tax - Debt ratio	- Cost of goods sold to sales - Selling and general administrative expenses to sales - Total operating expenses to sales - Cost-benefit analysis	- Productivity - Delivery cycle time - Number of incorrect order fulfilments

Source: Own representation with reference to Barua et al. 2001, Holler 2009 p. 30-31, Liu et al. 2008 p. 86, Kryvinska et al. 2010, Kryvinska et al. 2011, Kryvinska et al. 2013, Schryen 2010 p. 228, Zhuang 2005

3.1.4. Non-Economic business value assessment

Succeeding in focusing on non-economic activities and its specific business value assessment may also lead also to increased company benefits on an economic level. As already shortly explained, non-economic features are not easy to quantify. So firstly every company needs to determine how these indicators will be measured. For instance if the company tries to measure customer satisfaction, it can choose between several measurement methods, such as customer surveys, focus groups, observations or simply collect online data like the number of loyal customers or a rate of applied discount coupons (Rust and Kannan 2002, p. 18). Besides of this every customer behaves differently and has other view on an excellent customer service. Therefore, the next step in general includes developing suitable evaluation scales together with a proper specification of every single scale dimension. For an illustration measuring eService security on a scale with the values

high, middle and low is not yet a complete and appropriate approach. Rather the scale should deliver numeric or non-numeric measures. So the security may be defined either on a numerical scale or a scale expressed in lexicons as much detailed as possible (Chang et al. 2005). Moreover, also the scale dimensions should be characterized as detailed as possible, so that it is plausible for the concerned enterprise what is understood by the terms high, middle and low security.

To improve the business value on a non-economic level, companies usually need to maximize customer and employee satisfaction as well as quality of the offered items. The assessment areas are summarized in Figure 8, whereas both customer and employee satisfaction have wide application possibilities not only for eServices, but also for traditional services or physical products. The illustrated quality assessment dimensions of Figure 8 on the other hand are only exemplary and target the eServices quality assessment.

Figure 8: Non-economic business value assessment areas

Customer satisfaction	Employee satisfaction	Quality
• Customer survey • Focus group • Observation • Evaluation of online data	• Employee survey • Focus group • Observation • Employee committees • Evaluation of employee statistics	• Fulfillment • Efficiency • Availability • Security • Convenience • Incentive • Reliability • Assurance through employees • Empathy of employees • Responsiveness of employees

Source: Own representation with reference to Stiglingh 2014

As already shortly explained, in order to measure customer satisfaction companies can run customer surveys, organize focus group discussions with selected customers, observe their buying behaviour or evaluate data collected online. A very similar approach can be applied for evaluating employee satisfaction. On the employee level the companies are able to make employee surveys or focus groups, observe the behaviour of the employees, but also build employee committees that enforce measures in order to increase employee satisfaction. Several employee data might be used in specific employee-base metrics as well. Lastly the internal quality is of crucial importance for a high business value. When

taking an eService as an example, the company should measure the fulfilment of the eService purpose, its efficiency, availability, security, trust, convenience, but also the incentive as the motivation for using the eService. Nevertheless the customer service is also very important, as it can contribute to reliability and assurance, whereas the empathy and high responsiveness of employees is a must (Stiglingh 2014).

3.1.5. Internal and external business value assessment

Business value assessment metrics and models may be also classified to be internal or external. The internal business value assessment includes measures that can be internally influenced by the company itself. These measures include the management decision factors shown in Figure 6. This means in more detail that every company can directly influence the operations, the type of investments and financing in order to maximize the business value. Also the performance metrics shown in Figure 7 together with the quality components and employee satisfaction assessment shown in Figure 8 are part of an internal business value assessment. On the other hand the customers and their behaviour directly influence the external business value assessment. Therefore all metrics from Figure 7 connected with purchasing transactions, sales volumes and revenues, as well as customer satisfaction assessment shown in Figure 8 belong to the external business value assessment (Bolton and Drew 1993, p. 175; Rust and Kannan 2002, p. 17-18).

3.2. Business value assessment of eServices

Lu et al. 2007 distinguishes in his study four major categories of the eServices business value assessment: assessment of eServices features and functions, customer satisfaction, economic indicators and assessment models. This Section of the master thesis presents an own-developed business value assessment framework based on the first three mentioned categories, but including a forth one, assessment of employee satisfaction. For all of these four categories suitable metrics and models are developed and described in detail. Then an overview about already existing assessment models is given. The relevant categories are described as follows:

- *eServices features and functions:* The first step in the eServices business value assessment is the basic evaluation of the eServices itself. That means, every company

should firstly analyse the quality of the eService together with its features, functions and usability. A proper designed eService is the basis of success and only when proper designed it can address potential customers and maximize the profits (Lu et al. 2007, p. 16-19).

- *Customer satisfaction:* As satisfied customers are most likely to become loyal customers and build long lasting business relationships, the metrics and models in this second category focus on the customer satisfaction with eServices (Lu et al. 2007, p. 16-19).
- *Economic indicators:* According to Lu et al. this category primarily deals with analysing investments in an eService, but for the purposes of this master thesis this category is enhanced by all economic factors suitable for measuring the eServices business value. Most important in this sense are all cash flow, earnings, profit, expense and performance based metrics (Lu et al. 2007, p. 16-19).
- *Assessment models:* Many scientists focused on the development of various business value assessment models also practitioners may use when evaluating eServices. For instance some scientific studies developed a complete set of measurement methods for a particular eService, while other worked with frameworks for quality assessment, ex-ante value driven development of eServices, ex-post business value analytic models and so forth (Lu et al. 2007, p. 16-19).
- *Employee satisfaction:* The last category able to maximize the business value is considered to be employee satisfaction that is often being underestimated in the scientific evidence. Nevertheless this category is very important for every company as satisfied employees contribute to an increased quality of eServices and in turn also to customer satisfaction.

Moreover Loukis et al. 2012 supports the need to use business analytics on several levels as well in order to collect enough information about the strengths and weaknesses of the own eServices, their value creation and improvement potential. This seems to be necessary, as often the eServices are not designed in conformity with the users' needs. It should be underlined that a very good starting basis for such an evaluation offers the collection of online data that are available in an adequate amount (Loukis et al. 2012). Such online data are considered to be a very good input in metrics and models assessing the above-mentioned categories.

3.2.1. Assessment of eServices features and functions

When starting with a practical assessment of eServices business value, it is necessary to target the particular eService on its own. The ultimate goal of every eService is to be attractive to its users and to be designed in a way it will be demanded. Moreover, the initial eService investments, the costs connected with its market introduction as well as other company's expenses should be covered by the number of sold items. Should the eService lack these basic features that predispose it to be successful, the company will not be able to fulfil its stated targets. But, by the means of metrics and models focusing on the eServices features and functions that should be applied by every company, it is possible to point at areas of improvement and thus make the eService more profitable. In the following the assessment of various eService features and function lies in the centre of the examination. The following table summarized the assessment elements together with metrics and models to be applied and relevant measuring units:

Table 2: Metrics and methods used for eService quality business value assessment

eService quality element	Metrics and methods	Units
Fulfilment	Fulfilment ratio	% of correct accomplishments
	Throughput	No. of served request in specific
	Latency	Time between request and
	Excess lead time	Time difference between provider commit date and user request date
	Customer request dates	% of customer request dates met
Efficiency	Completion rate	% of completed tasks
	Task level satisfaction	Scale evaluation in a customer
	System usability scale	Scale evaluation in a customer
	Retrieval speed	Time of retrieval
	Information input	Time needed to provide all information to start using the
	Information quality	Scale evaluation in a customer Expert inputs
Availability	Instant availability	% of successful access attempts
	Access probability	% of served requests
	eService health	% of errors on all significance
	Conversion rate	% of goal achievements
	Service availability	Time of service availability
Security	Return on security	Cost-benefit ratio of security investments
	Specific company software	Specific software depending on business ensuring security tasks
Convenience	Time saved	Time saved compared to
	Costs saved	Costs saved compared to

	Instant availability	% of successful access attempts
	Reduction of effort	Scale evaluation in a customer
	First contact resolution	% of instantly solved customer
Incentive	Conversion rate	% of goal achievements
	New customers ratio	% of new customers
	Regular customers ratio	% of regular customers
	Loyalty	No. of visits per customer
Reliability	Accurate eService delivery	% of accurate deliveries
	Order completeness ratio	% of complete orders
	Order truthfulness ratio	% of truthful order fulfilments
	Availability of employees	% of successful contact attempts
Assurance through	Final knowledge test	% or ranges stated in advance
	On-going knowledge evaluations	% or ranges stated in advance
	Estimated levels of trustworthiness	Scale evaluation in a customer
	Experienced levels of trustworthiness	Scale evaluation in a customer
Empathy of employees	n/a	Broadening scientific focus and ducting adequate research
Responsiveness of	Average speed to answer	Average answering time
	Abandoned rate	% of abandoned customer calls
	Service level	% of answered inquiries in the Predefined timeframe
	Average handling time	Average time handling customer inquiries

Source: Own representation with reference to Böhme 2010 p. 16, Chang et al. 2005, Collier and Bienstock 2006 p. 264, Hartjes 2009 p. 69-90, Kryvinska et al. 2011, Li and Suomi 2009, Nath and Singh 2010, Sauro 2011a, Schelmetic 2013, Schneiderman 1996, Stiglingh 2014

3.2.1.1. Fulfilment

The fulfilment of every eService provides metrics that are able to answer the question, whether it is working according to its purpose. Due to the fact that the customers often cannot test and evaluate the eService until they use it, every eService should keep the functional promises. When a company measures the eService fulfilment, it should use the extent to which a specific eService is able to fulfil its purpose properly. This measurement is expressed in a quantitative way very easily and can be used for all eService forms. For instance an eService with the purpose to conduct credit card verifications should be able to perform the task in different environments. To specify, the credit card verifications should run for both, domestic and international, credit cards (Nath and Singh 2010). Thus, the fulfilment ratio FR can be calculated by dividing the number of correct eService accomplishments by the number of all accomplishments.

$$FR = \frac{\text{correct accomplishments}}{\text{total accomplishments}}$$

Besides of this the fulfilment should also measure the speed of the eService performance, which happens either through measuring throughput or latency. Throughput measures the number of requests served during a specific period of time. Every eService provider should also measure the latency time, which stands on the customer site for the overall time between a sent request and a received response (Nath and Singh 2010).

$$\text{throughput} = \frac{\text{serving time}}{\text{served request}}$$

$$\text{latency} = \text{response received} - \text{request sent}$$

Excess lead time and the percentage of customer request dates met are considered to be also very important in this context, as they are able to measure the fulfilment of timely completion. To demonstrate the two metrics, a customer is taken as an example, who is interested in buying an individually configured cloud service, also known as Software as a service solution. It represents a service, which is not being run from the company's own servers, but instead from the provider's servers, which is an economical, flexible and reliable way of doing business for the companies. Also it often comes with technical support. The percentage of customer request dates met can be calculated by dividing the number of customer request dates met through the provider by the number of all customer requests. In the above-mentioned example this would mean providing the customer with the individually configured cloud service on or until the date the customer requested. Excess lead time can be expressed as the difference between the provider commit date and the customer request date (Schneiderman 1996).

$$\text{customer request dates met} = \frac{\text{customer request dates met}}{\text{all request}}$$

$$\text{excess lead time} = \text{provider commit date} - \text{customer request date}$$

It is important to underline that excess lead time and the probability of customer request date met need to be calculated at the earliest possible time in order to set measures for

reducing the excess lead time from the beginning and reducing the possibility of customer disappointments. When a delay in an ordered eService should happen, the provider needs to apply suitable metrics as well. Firstly, the provider should measure the exact time the delivery of an eService is in a delay. In case more orders are in a backlog, the provider should use metrics that express how long would it take to deliver the eServices currently in backlog when the whole operations would focus on handling and eliminating these orders (Schneiderman 1996).

3.2.1.2. Efficiency

An eService needs to be assessed also according to its efficiency, i.e. it should be designed well by means of time, costs and effort for its purpose. Relating efficiency to an eService, it has to be easy to use and properly structured. Then also a low retrieval speed (Stiglingh 2014) is relevant together with the need of relatively low information input by the user (Parasuraman et al. 2005). Finally, the information quality plays also an important role for an efficient eService (Nath and Singh 2010).

Ease of use refers to finding the relevant information the easiest and quickest way, that means with minimum customer effort. For eServices also the term of finding the information with as “few clicks” as possible has emerged. Proper navigation also goes in hand with the ease of use. Every website offering eServices, as well as the eService itself should consist of clearly structured sites, following a consistent menu, include all necessary information and also a searching tool (Collier and Bienstock 2006, p. 264). For purposes of search engines proper key words and Meta descriptions should be introduced. In general, steps for a search engine optimization (SEO) should be followed in order to reach the ease of use also on the customer level. Completion rates are a suitable metric for evaluating the ease of use. They indicate the percentage of completed tasks, which are expressed by dividing the number of completed tasks by all tasks.

$$completion\ rate = \frac{completed\ tasks}{all\ tasks}$$

Task level satisfaction can be conducted after the completion of a specific task by asking the users about its ease of use, for instance by using scale answers. The answers might be subsequently processed by the provider and specified for all relevant eService tasks. It is

necessary to survey the users right after the completed task, so that they can describe their positive or negative experiences immediately. An option is also asking the users to assess their expected task difficulty and compare it to the experienced task difficulty. Furthermore, companies offering eServices can also decide to do a more detailed survey, using the so-called System usability scale. It consists of ten items summarized in Table 2 and scaled answers reaching from 1-strongly disagree to 5-strongly agree. According to the answers the provider can measure the extent of the ease of use. Mostly for web-based eServices the proper structure can be assessed using external tracking metrics, such as analysing the entry and exit pages, the most and least visited pages and combine them with user data, such as the length spent on the webpage, click tracking and the number of exits happening immediately after opening the entry page (Sauro 2011a). In Section 3.2.2.4. these metrics will be described further.

Table 3: System Usability Scale survey questions

1.	I would like to use this system frequently	6.	There was too much inconsistency in the system
2.	The system was unnecessarily complex	7.	Most people would learn to use this system very quickly
3.	The system was easy to use	8.	The system was very cumbersome to use
4.	I would need technical support to use this system	9.	I felt confident when using the system
5.	The functions of this system were well integrated	10.	It was necessary to learn a lot of things prior to work with this system.

Source: Own representation with reference to Sauro 2011b

Moreover, the lower is the retrieval speed, the higher is the efficiency of the eService. The speed can be very easily measured in seconds or minutes. The more information needs to be put into the eService, the more complex and the less easy to use the eService becomes. This implies the need to measure the information input by the provider, in order to minimize it as much as possible. Providers could again use time in seconds or minutes to measure the necessary input, or simply calculate the amount of such information. Lastly, the information quality has a positive impact on eService efficiency. Information should be complete, accurate and timely. Like some of the previously mentioned indicators, also different individuals will assess the information quality differently. A possibility to assess the information quality is to conduct a survey with the focus on the information quality

criteria, such as believability, understandability, relevancy, value added and so forth. It is important to point out, that also in this case suitable scales are necessary. Ranges for optimal scores should also be defined, as well as example cases to guide the user. Another option for evaluating the information quality is asking for an expert input (Neumann and Rolker 2000).

3.2.1.3. Availability

Availability refers to the extent an eService is available for instant use. It includes hardware, network, software and service availability (Kryvinska et al. 2011). Companies can measure the availability using a metric giving the percentage of eServices instant availability. To calculate the percentage simply the number of successful access attempts is divided by the number of all access attempts. From this follows that the higher is the percentage the better it is for the company. In other words, in this case the probability that the eService is available is higher. On the other hand a low percentage implies that there is a high probability that the eService will not be available for instant use (Nath and Singh 2010).

$$\text{instant availability} = \frac{\text{successful access attempts}}{\text{total access attempts}}$$

But, the eService availability depends on the accessibility (Nath and Singh 2010), pre-testing, crash and freeze problems (Stiglingh 2014), which have a direct influence on the conversion rate, as well. When the server where an eService is located is dealing with a lot of requests, it becomes not accessible. So the eService is not able to serve a customer request, although it is generally available. Applying the access probability metric shows how likely it is that the request is being served. The calculation should be conducted by dividing the number of served requests by the number of all requests. As it is the case for calculating the availability percentage, the higher is the percentage the better it is for the company and in turn for the user (Nath and Singh 2010).

$$\text{access probability} = \frac{\text{served requests}}{\text{total requests}}$$

In order to guarantee the highest possible availability, the eService provider needs to be concerned about planning a sufficient pre-testing (Stiglingh 2014). Even before the provider uses the availability metrics already introduced, whose basis lies in working with real data, he should pay attention to a proper pre-testing. Within the scope of such a pre-testing both the availability and accessibility should be tested and expressed in metrics prior to launching and offering the eService to the customers. When a not sufficient result is present, the provider can always try to come up with some improvements, such as increasing the scalability of the system (Nath and Singh 2010). Very good indicators for eService availability are crash and freeze problems, which also represent the so-called eService health. They are measurable only in case they are being recorded and can reach from lightweight errors, such as mistakes during providing information by the customer, up to serious errors, such as a partial or total breakdown of the eService. In order to monitor the errors, mostly a responsible person is needed to analyse the error recording and classify them into levels of significance. After that error ratios on all relevant significance levels for the provider should be calculated. It is crucial to point out that serious errors may also have a direct impact on the conversion rates. Conversion rate stands for the ratio of goal achievement to customer visits, which often means a ratio of achieving a purchase decision to customer visits. They can be tracked through all stages of an eService purchase process, whereas an increased percentage of customers not completing a checkout process may be the sign for error issues (Sauro 2011a).

$$\text{conversion rate} = \frac{\text{goal achievements}}{\text{customer visits}}$$

Moreover, an eService provider can also apply more complex metrics to measure the availability. Thus availability can be expressed using the following formula:

$$SA = \frac{MTBF}{MTBF + MTTR}$$

Service availability SA is higher in case the mean time between failures (hereafter MTBF) is high as well, or the mean time to repair (hereafter MTTR) is low. MTBF tends to reach high values for highly reliable systems. Reparability calculated through MTTR measures the time a system can be restored (Kryvinska et al. 2011).

3.2.1.4. Security

The next very important eService quality feature increasing the business value includes the security metrics. Nowadays one of the easiest and most common unauthorized ways of stealing personal data is stealing them electronically. Actually the security of eService providers should be of a high concern, as for instance customer personal data often need be transferred to the eService provider so that the eService is able to fulfil its purpose. These data are at the same time often not a property of the eService provider, but instead of the customer's organisation, which assured that they would not be shared with any uninvolved third parties. Firstly it is the company's interest not to provide the data to others, e.g. to the competitors. Secondly the customers themselves have the right given by law to data security (Nath and Singh 2010). The primary goal of eService security is thus the protection of personal information (Stiglingh 2014). Along with security metrics usually comes the increased awareness about security within the company, as well as the highlighted need for further actions or necessary investments (Payne and Vieira 2014). Every company needs to determine for itself what are the level of risk acceptance and the level of desired security investments. So regarding the security topic commonly the investments in security are measured as cost-benefit ratios. The return on security investment (hereafter ROSI) is a very good indicator for security efficiency. The higher it is the higher is also the efficiency of the realized security investment (Böhme 2010, p. 16).

$$ROSI = \frac{\text{benefit of security} - \text{cost of security}}{\text{cost of security}}$$

Besides of this metric there exist various software tools that are able to support a company with ensuring the necessary security tasks. These include confidentiality, integrity and availability. Using such a software also enables to collect a sufficient amount of data for deeper evaluation purposes.

3.2.1.5. Convenience

A high convenience experienced during the use of an eService contributes to a higher quality of an eService and as a consequence to its higher business value. Often convenience is the part of the emotional benefit or emotional value, which stands for "*the degree to which using the service arouses positive feelings*" (Fassnacht and Koese 2006).

It can be measured either in an objective way through time and costs saved, degree of time and location availability, or subjectively through the reduction of effort (Stiglingh 2014).

Time and cost saved using a particular eService can be expressed by comparing it to another option, which means to another eService or in case there is no eService option available, to another kind of solution, e.g. a physical one. As customers appreciate time and cost saving alternatives, the solution with the lowest completion time and the lowest costs needed, will be preferred with a high probability. Both indicators can be calculated using the following formulas, whereas in cases where the compared alternatives show significant differences there is a greater tendency of choosing or switching to the more beneficial one.

$$\text{time saved} = \text{time needed alternative 1} - \text{time needed alternative 2}$$

$$\text{costs saved} = \text{costs needed alternative 1} - \text{cost needed alternative 2}$$

For eService users the unlimited time and location availability is crucial for a purchasing or using decision. Ideally the users should be able to access the eService anytime and anywhere. Both can be calculated through the instant availability already analysed in Section 3.2.1.3. while taking into account the availability on a time and location level.

Finally the reduction of effort can be measured using customer surveys. It needs to be emphasized again that every customer acts differently and can make valuable survey suggestions a company can use to improve the eService. Besides of this the eService provider should develop an easy to find and easy to use self-service, such as implementing frequented asked questions or give the user the opportunity for an instant contact via a service line or e-mail. Then the provider can implement a first contact resolution rate (FCR), giving the percentage of customer contacts with an instant solution of the issue (Schelmetic 2013). The calculation can be conducted as follows:

$$FCR = \frac{\text{problem resolved during first contact}}{\text{total customer issues}}$$

3.2.1.6. Incentive

Every eService provider should make efforts to motivate the customers to switch to or start using the particular eService. These goals can be reached through the so-called incentives. These might include promoting better features and functions compared to the competitors or other currently dominantly used solutions. Alternative common ways are special offers, additional services, participations in special memberships or clubs. However, other eService providers emphasize the company image. For example, in case a provider acts environmentally friendly, produces less waste or simply uses energy friendly solutions, it would be of his interest to communicate and promote these facts to the potential customers. Environmentally friendly customers will then have a motivation to start the business with this provider based on his positive image.

There exist several ways of measuring incentive efforts. Achievements in the incentive field can be reflected in the conversion rate, ratio of new and regular customers, loyalty ratio (Hartjes 2009, p. 69-90) and naturally in the economic indicators that are discussed in Section 3.3.3. New or regular customers ratio measures the percentage of new or regular customers, whereas the loyalty represents the extent of returning customers. Higher loyalty often stands for a higher company success.

$$\text{new customers ratio} = \frac{\text{new customers}}{\text{all customers}}$$

$$\text{loyalty} = \frac{\text{total visits}}{\text{total visitors}}$$

To sum up the goal of using incentives is to attract as many customers as possible together with increasing the own eService demand, company's image and improving economic indicators. All of these factors have a positive effect on the provider's business value.

3.2.1.7. Reliability

Reliability refers to an eService performance according to company promises (Wali and Opara 2012). Because reliability in this context does not include technical aspects of service delivery, accuracy and timeliness of the eService have a direct influence on it.

Therefore, it can be analysed only after the eService delivery (Nath and Singh 2010). Should any issues concerning the reliability arise, it is necessary to ensure that employees are available to help and assist the customers in order to ensure a high reliability level (Stiglingh 2014).

To start with the assessment of the eService reliability, the delivery procedure should run accurately. Besides of this the provider has to ensure that the eService order is complete and that the customers are served with truthful information. Moreover, service and promotion promises need to be kept and skilled personnel should be available for clarifying issues (Li and Suomi 2009). The presented metrics in the following help the companies to keep a track of reliability extent:

$$\text{accurate eService delivery ratio} = \frac{\text{accurate eService deliveries}}{\text{total eService deliveries}}$$

$$\begin{aligned} &\text{eService order completeness or truthfulness ratio} \\ &= \frac{\text{complete or truthful orders}}{\text{total orders}} \end{aligned}$$

$$\text{availability of employees} = \frac{\text{successful contact attempts}}{\text{all contact attempts}}$$

3.2.1.8. Assurance through employees

Next crucial eService quality dimension is the assurance of knowledge and skills through the employees. Proper knowledge together with promoting trust and confidence are the primary goals to be reached (Stiglingh 2014). Trainings of the employees, as well as other knowledge measures such as workshops, quick meetings, summarized instructions and on-going support of the support employees are suitable tools to reach the necessary knowledge level. The result should be competent customer service employees with enough skills and expertise (Nath and Singh 2010).

There exist several ways, how a company can measure employees' knowledge and skills. First of all implementing a final exam after the training period is a proper way, how to begin with the knowledge assessment. As eServices tend to change and adapt to become

more valuable, testing employees should continue and work in conformity with these changes. Then employees and their applied knowledge should be evaluated in regular intervals and on real cases. Here also the evaluation of soft skills is very important, as competent solving of issues together with confident behaviour leads to increased customer trust. The results of these measurements need to be classified according to previously determined and agreed ranges or eventually percentage values.

The trustworthiness of customers to a particular company has to be measured using scales. These scales may have several levels with corresponding descriptions and quantitative expressions. Asking customers about their estimated and experienced level of trustworthiness and calculating the overall value by means of the quantitative value expressions will deliver a comparable level of trustworthiness. As the description itself already reveals, the estimated level of trustworthiness is a prediction taking place before the eService delivery, whereas the experienced level of trustworthiness is a subjective customer estimate after the eService delivery (Chang et al. 2005). The level of trustworthiness generally increases together with the number of repeated interactions with the provider (Balasubramanian et al. 2003).

3.2.1.9. Empathy of employees

Understanding the specific user needs is the next dimension of eService quality (Nath and Singh 2010). According to scientific evidence, employee empathy has a positive impact on customer satisfaction and loyalty, which makes it essential for the creation of business value (Wieseke et al. 2012). As a result of supporting customers in the eService field, proper empathy skills need to be trained and in turn applied due to a missing personal contact with the customer. What is more, because of the already discussed rapid changes and high competition in the eService field, empathy can play a key role when distinguishing a particular company from others. Higher empathy is what can become one of the main factors of higher business value when compared to the competitors. Improving employee empathy towards customers is a product of trainings, experiments, role-plays and observations (Forbes 2013a). However, there is a lack of research in the area of measuring empathy of employees. At the same time it is recommended to extend the scientific focus on the empathy and conduct an adequate research concerning its assessment via metrics and models.

3.2.1.10. Responsiveness of employees

The last element belonging to the quality of an eService that is concurrently driving the business value is the so-called responsiveness of employees. It represents all metrics for the assessment of the employees' speed performance and their willingness to help and solve the customer issues (Stiglingh 2014). *“Responsiveness is the willingness and speed with which the support staff of the web service provider makes the initial response to inquiries from users”* (Nath and Singh 2010).

Widely used measurement tools include the average speed to answer, abandoned rate, time service factor also referred to as service level and average handling times. Firstly, average speed to answer stands for the average time a customer is waiting to get in touch with the provider or receive a reply. Usually the target varies depending on the contact channel, i.e. the customer may contact the provider of eServices often only over the telephone or e-mail. Secondly, the abandoned rate measures the percentage of telephone contacts abandoned while waiting on the answer. It is evident that the customer wishes to reach the provider as soon as possible without any prolonged waiting time. The latter causes higher abandoned rates, customer complaints and decreased customer satisfaction. Having high results in this metric is a warn signal for the provider to take immediate improvement measures in order to retain high customer satisfaction levels. Thirdly, the time service factor often called service level expresses the ratio of answered customer inquiries in the agreed time frame. Normally the service level target is negotiated internally or with the outsourcing partner and differs. To exemplify the service level for telephone inquiries might be to answer 80% of all calls within 20 seconds and to answer 95% of email inquiries within 24 hours. Since not all customer issues will be solved in the first instance, i.e. through the customer service employees, it is inevitable to include the service level also internally between the various provider departments. The goal of this procedure is to speed up the issue solution finding. Lastly, the average handling time is able to measure the average time spent with solving the customer issues. In the following metrics for the above-mentioned factors are presented:

$$\text{average speed to answer} = \frac{\text{total time before answer}}{\text{total customer inquiries}}$$

$$\text{abandoned rate} = \frac{\text{total abandoned calls}}{\text{total calls}}$$

$$\text{service level} = \frac{\text{answered inquiries in the predefined time frame}}{\text{total answered inquiries}}$$

$$\text{average handling time} = \frac{\text{total handling time}}{\text{total answered inquiries}}$$

3.2.2. Customer satisfaction

In the previous Section features and functions of an eService with a direct impact on customer satisfaction were introduced. Quality of eServices has a significant positive impact on customer satisfaction, which has been examined in several scientific studies (Sun 2010, p. 32). But customer satisfaction is not only a product of eService features and functions. It also includes all factors that are able to meet the user needs including cost or risk attributes. Mostly customer satisfaction is a subjective post-consumption evaluation with a focus on benefits. One of the main goals of every company offering eServices consists of the knowledge and creation of factors driving the customer satisfaction, as it is essential for a company continuity and prosperity. In order to achieve this goal, the company needs to analyse and make these factors measurable (Graf and Maas 2014, p. 61-63). It needs to be pointed out that according to scientific evidence high customer satisfaction has also a positive impact on customer loyalty, which is nowadays highly relevant (Wali and Opara 2012).

Table 4: Metrics and methods used for measuring customer satisfaction

Customer satisfaction evaluation tools	Metrics and methods	Units
Customer survey Focus group Observation	Perceived quality	Scale evaluation of the overall experience
	Loyalty/net promoter score	% of recommendations % of recommendations as the difference between promoters and detractors
	Attributional	To be stated by the eService
	Intention to	% of customers with intention to repurchase
Evaluation of online data	Page views	No. of page views
	Visits	No. of visits

	Unique visitors	No. of unique visitors
	Loyal visitor ratio	% of loyal visitors
	Repeated visitor ratio	% of repeated visitors
	Visit duration	Time spent on the web page
	Click stream analysis	e.g. entry and exit pages, on the eService purpose
	Drop rate	% of visitors leaving after viewing The entry page

Source: Own representation with reference to Ciotti 2013, Hartjes 2009 p. 69-90, Sincero 2012

Besides of those already presented metrics and methods positively influencing the eService quality and at the same time customer satisfaction, there exist several standard evaluation tools for customer satisfaction that will be introduced in the following. They include conducting a customer survey, building a focus group, doing observations and experiments, but also to evaluate online customer data. The metrics and methods with a direct impact on customer satisfaction are presented in Table 4.

3.2.2.1. Customer survey

Conducting a customer survey is a very popular and standard method for measuring customer satisfaction. As eService providers lack in interacting with their customers personally and the contact is rather ensured through the Internet or in some cases also via phone, in this place only conducting a customer survey online will be examined in more detail.

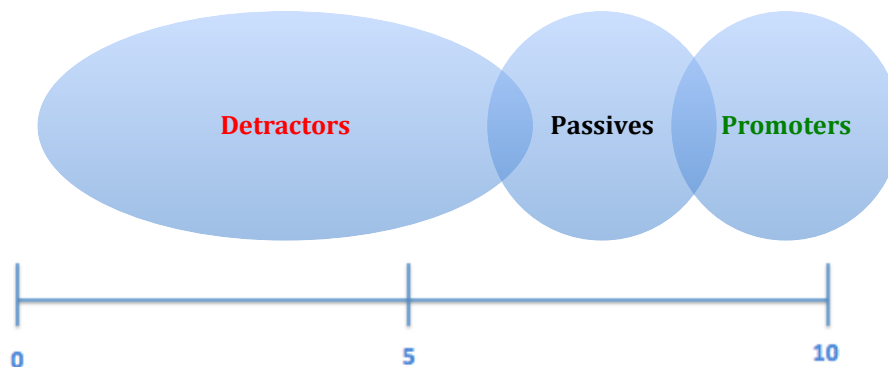
Generally online customer surveys come up with a range of advantages, such as reduction of costs, reaching responders globally, faster execution, respondent convenience, reduced complexity during data evaluation or design flexibility. On the other hand, it is also connected with some disadvantages that include the absence of the interviewer for ensuring more useful results or survey fraud (Sincero 2012). There might be significant differences between the customer surveys depending on the kind of eService as well as provider. What applies equally for all kinds of customer surveys is their length, i.e. it should be only as long as necessary focusing only on the crucial parameters in order not to overstrain the respondents and motivate them to participate and finish the survey.

Usually the focus of an eService customer survey lies in examining the perceived quality, loyalty, attributional satisfaction or intension to repurchase. Normally, there is a scale

evaluation behind the key survey questions focusing on the above-mentioned criteria that can easily turn the evaluation into a quantitate metric and make the result also comparable. Firstly, the perceived quality centres on the overall experience with the provider. This kind of evaluation normally works with answering one simple question after the purchase. Nowadays perceived quality surveys on specialized evaluation portals are common, as they act independently and promote trust among the customers. The outcomes are then often placed directly on the home page of the eService provider. Secondly, loyalty of the customers can be measured by asking the customers whether they would recommend the provider to others. The so-called net promoter score is a key metric in this context. The respondents are asked to state the likeliness of a further company recommendation on a scale ranging from zero to ten, whereas zero stands for no recommendation and ten for a full recommendation. Respondents choosing nine or ten are called the promoters of the company, answers seven and eight belong to passive respondents and all answers in the range zero to six are the detractors as illustrated on Figure 9. The net promoter score is calculated as the difference between the percentage score of promoters and detractors.

$$\text{net promoter score} = \% \text{ of promoters} - \% \text{ of detractors}$$

Figure 9: Scale of the net promoter score



Source: Own representation with reference to Ciotti 2013

The score is positively correlated with a high probability that the customer will come back and do another business transactions with the eService provider, which is the reason to set higher targets for this metric (Ciotti 2013).

Thirdly, customer surveys tend to examine also the attributional satisfaction of the eService. It is the task of the eService provider to state the areas that are subject to a

customer survey together with suitable metrics. Ten main quality elements of eServices that might be targeted during the survey are summarized in Table 2. Customer feedback should not be underestimated, as it is a very valuable input for improvement. Fourthly the likeliness to do another business transaction with the eService provider can be measured through the intention to repurchase. According to the answers of the respondents, it is the rate of customers that are planning to repurchase (Ciotti 2013).

$$\text{intention to repurchase} = \frac{\text{customers surveyed with intention to repurchase}}{\text{total customers surveyed}}$$

3.2.2.2. Focus group

A very suitable additional tool for measuring customer satisfaction besides of a customer survey is a focus group. Including a focus group into the customer satisfaction evaluation can help to get deeper insights into the surveyed areas when compared to conducting solely a customer survey. The focus group contribution lies in organizing a discussion of specifically selected participants that are able to discuss the problem setting. Space is also given to another problem topics that appear during the discussion, as interactions with other participants often drive new ideas and broaden the view on the discussed topic (Van Soom 2009). It is usual to have a moderator, who is leading the discussion according to a predefined schedule. Incentives for participation are common as well.

Besides of this it is a very important goal of the eService provider to develop suitable focus group questions targeting at the problem areas. There exists no tutorial the provider can stick to. Mostly the targeted areas will be equal to those of a customer survey, i.e. perceived quality, loyalty, attributional satisfaction or intension to repurchase (Ciotti 2013). These are the main interest areas of the eService providers. Behind the customer satisfaction evaluation there is the intension to improve the offered eService, the economic indicators and in turn to increase the business value. Thus, the discussion questions centre the overall satisfaction of the users, likeliness of further recommendations of the provider, quality factors of the eService together with potential improvement areas and additionally the likeliness to do further business with the provider.

3.2.2.3. Observation

The virtualisation of services has brought significant differences to traditional primary data acquisition, like it is the case for an observation. This is a well-run method for obtaining necessary data for physical products or traditional services, but it can be useful for eServices as well. According to scientific evidence online observation should be given more attention to, as it can reflect online human behaviour and customer satisfaction. Online observation is essential also to gain an overview about the current settings, users and interactions between them or between the users and the provider (Liang 2007). Depending on the examined eService the observation can be overt, i.e. in this case the users of the eService are aware of being observed. For instance this could be the case for an eLearning platform, where the researcher would overtake also the role of a moderator or even an eLearning participant in order to get the best insights into the areas of examinations. Then it is possible to conduct a covert observation. Here the researcher is fully integrated and the other users are unaware of being observed. A good example would be an observation of an eBanking service with the target to come up with attributional improvements (Norskov and Rask 2011). Observing an eService in order to draw conclusions about the customer satisfaction can follow the same scheme as already presented in the two previous Sections. The observation areas will target perceived quality, loyalty, attributional satisfaction or intension to repurchase (Ciotti 2013). In most cases the observation method is not conducted without any further primary data acquisition methods (Liang 2007).

3.2.2.4. Evaluation of online data

As online data can be collected, stored and analysed very easily, it is recommended to apply web analytics tools on a regular basis. They help to understand own customers and point at areas that can improve the overall customer satisfaction. But, one needs to be aware of the fact that web analytics is only able to display the facts and not to answer “why” questions and explain reasons for customer behaviour. Therefore, eService providers should always pay attention also to other customer satisfaction evaluation methods and combine them with using web analytics. There exist numerous web analytics software programmes that companies can make use of. In the following the most crucial metrics are introduced.

The page view calculation belongs to basic web analytics metrics. It represents the number of accessed web pages, which can show the general demand of an eService. Nevertheless, it needs to be correctly interpreted according to the eService purpose, including all other web analytics metrics. A high page view number will be for example positive for an eLearning platform, as high number of accessed eLearning articles is most likely connected with high demand and satisfaction. But, a high page view number might be negative for eGovernment, since the goal is to simplify official processes. A high number of page views could be connected with user complications or explained as not easily to find information (Hartjes 2009, p. 69-90).

$$page\ views = \frac{total\ page\ views}{webpage}$$

Further, basic indicators include number of visits and unique visitors. During a visit usually a visitor views more pages, whereas the visit ends after leaving the page and being inactive for approximately 30 minutes. When analysing the metric number of visits comparable time frames should be taken into account and fluctuation reasons need to be inspected. A high result stands for a high demand of both new and returning customers, what is at the same time a good indicator for customer satisfaction. The unique visitor metric represents the number of unique visitors during a chosen timeframe. It does not include the same visitors, search engine bots or other automatic visitors. Limitations apply also here e.g. in case one person is using more browsers, more PCs or vice versa. (Hartjes 2009, p. 69-90).

Then, metrics of customer satisfaction assessment focus on the visitor and his behaviour. Web analytics is able to monitor one-time visitors, repeated visitors and loyal visitors. In a consequence the ratio of these visitors types needs to be calculated. It is obvious that a higher ratio of repeated and loyal visitors expresses a higher customer satisfaction. The behaviour of the visitors should be analysed according to their visit duration respectively the click stream. Drop rate shows the percentage of customers that leave the page immediately after viewing the entry page (Hartjes 2009, p. 69-90).

3.2.3. Employee satisfaction

Employee satisfaction markedly helps towards achieving a high business value and deserves closer attention in this Section. As already displayed on the Figure 3 employee satisfaction plays a very important role in the whole value creation process (Heskett et al. 1994). A high percentage of satisfied customers is the result of positive customer-employee relationships (Zondiros et al. 2007).

Methods of capturing employee satisfaction include employee surveys, employee focus groups, observation, activities of employee committees and the evaluation of employee statistics that are explained in the following Sections. For the purpose of this master thesis, Table 5 illustrates some exemplar metrics and models that will be described further. Generally speaking every company needs to specify the focus of employee satisfaction measurement on its own and pick right metrics and methods for the particular company problem. Thus, the metrics and methods in this area should be individually tailored to the company as well as suitable scale evaluations should be developed.

Table 5: Metrics and methods used for measuring employee satisfaction

Metrics and methods	Units
Satisfaction with supervisors	% of employees satisfied with their supervisor
Issues experienced with the supervisors	No. of issues experienced in the employee-supervisor relationship
Ratio of job improvement suggestions	% of employees having improvement suggestions concerning their own job position
Satisfaction with the job	No. of employees satisfied with their job position
Self development possibility	% of employees experiencing self development possibilities
Interactions between the employees and supervisors	% of inappropriate behaviour in the employee-supervisor
Employee performance	% of employees performing according to the agreed targets
Commitment to customer service	% of employees behaving according to agreed rules in the customer relationship
Voluntary fluctuation rate	% of voluntary employee terminations during a specific period
Absenteeism rate	% of absence working days
Sickness rate	% of employee sickness
Average sickness days	Average no. of sickness days per employee
Internal performance and quality ratings	To be stated individually by the company
Training days	Average no. of training days per employee

Source: Own representation with reference to Townsend et al. 2007, Forbes 2013b, Cook 2008, p. 32

3.2.3.1. Employee survey

A standard method for measuring employee satisfaction is the employee survey. Townsend et al. 2007 presents 14 factors companies should focus on when structuring the surveys that are summarized in the Table 6. To obtain valid results it is of a great interest of the company to explain the purpose of the survey to the employees and in rough terms the steps planned to be taken on the basis of the survey results. Essential is also to guarantee the anonymity, as otherwise the employees might not answer truthfully (Townsend et al. 2007). Every company needs to cope with the problem of developing adequate survey questions, stating core survey dimensions and elaborate suitable scale evaluations. In other words, it is the task of the eService provider to choose which factors he wants to put in the midpoint of the survey and what are the goals to be achieved.

Table 6: Employee survey dimensions

Dimensions of employee surveys	
Supervision	Remuneration
Job itself	Transformation
Personal development	Performance management
Colleagues	Diversity
Work Place	Ethics
Policies and Procedures	Respect
Communication	Commitment to customer

Source: Own representation with reference to Townsend et al. 2007

A detailed examination of all factors of an employee survey focus would be out of scope of this master thesis. To mention some examples, the eService provider may analyse the supervisors and target the cooperation with them, their support, motivation, skills, qualification and acting like a role model. The corresponding metrics could involve the ratio of employees satisfied with their supervisors or number of issues experienced with them. The evaluation of the job itself should bring improvement suggestions from employees that could be expressed in ratios or point out to the number of employees satisfied with their scope of employment. Then personal development is a very important factor, as satisfied employees need to be given self-development possibilities in order to meet their personal demands. Metrics for an employee survey with the personal development emphasis should include the ratio of employees who experience or do not experience personal development possibilities.

3.2.3.2. Focus group

An employee focus group is the right approach to be carried out next to an employee survey. Nevertheless, a moderator should be neutral in order to gain accurate employee opinions and insights. The main objective of an employee focus group is often a determination of key engagement parameters. Consequently the participants should be given a feedback about the discussion and actions following from the output should be planned (Cook 2008, p. 49-56). The parameters of employee engagement are shown in the Table 6 and equal to those already discussed as suitable for an employee survey (Townsend et al. 2007). It needs to be pointed out that stating the key parameters and in turn the discussion questions is the task of the eService provider.

3.2.3.3. Observation

Observation allows raising awareness about the factors driving employee satisfaction. It is a task that needs to be done on a regular basis so that the effort pays off. As a starting point one can for instance observe the interactions between the employee and the supervisor. Then the supervisor needs to observe the performance of the employee according to agreed targets. It is very important that a feedback talk or a coaching follows such an observation. Strengthened communication, increased motivation and performance and provided support are the main advantages in this field (Performance management 2014). But an observation of the employees' performance followed by a personal talk is also able to ensure that the employee is satisfied with the job itself, or in case he is not, improvement steps can be introduced. Other easily observable dimensions include interactions with the colleagues, acting according to valid policies and procedures, communication, respect to others or commitment to customer service by means of observing the interactions with the customers (Townsend et al. 2007).

3.2.3.4. Employee committees

As the name reveals members of employee committees are employees of the company who are responsible for issues concerning the employees and employment relationships as well as providing inputs for better employee conditions. Their establishment seems to be positive in almost every company. Employees can participate in an employee committee

on a voluntary basis but need to take the tasks seriously and take steps to defend the employees' interests. They also communicate benefits to other employees together with other findings, recommendations or even confrontations. Moreover, the employer has to inform the committee about the current issues in the organisation together with a vision how the committee can help solving them. To sum up, having an employee committee in an organisation can positively contribute to an increased employee satisfaction (Sammer 2012).

3.2.3.5. Evaluation of employee statistics

Few more metrics can help companies to understand the employee satisfaction levels. Fluctuation rates are able to measure the staff turnover (Cook 2008, p.19). To calculate the fluctuation rate simply the number of employees, who left the company, is divided by the number of all employees at the beginning of the period. Usually the metric is used on a yearly basis, but it can be used for all possible periods without any problems. In order to receive significant results for this metric, it should be split into the voluntary and non-voluntary fluctuation rate. Non-voluntary terminations include those given by the company, whereas voluntary terminations are given by the employees and are able to express the employee satisfaction. From this follows that the higher is the percentage of voluntary fluctuation rate, the lower is the employee satisfaction.

$$\text{voluntary fluctuation rate} = \frac{\text{voluntary terminations during a period}}{\text{total employees at the beginning of a period}}$$

Another metric worth analysing is the number of absence days for a specific time period. Of course this metric has a direct negative impact on the economic indicators of the company, as it is connected with lower productivity. But, it is also possible to examine the metric in line with the employee satisfaction. Taking into account the number of absence days, the absenteeism rate can be measured by dividing the absence days by the number of working days during a time period. High result can explain employee dissatisfaction. The reasons for absence days are on the one hand of a legitimate character and on the other hand of a not legitimate character. Generally the reasons include own or a family member's illness, stress, low morale, depression, disengagement or finding a new job (Forbes 2013b).

$$\text{absenteeism rate} = \frac{\text{absence days}}{\text{working days}}$$

Absence days that are excused by illness represent the basis for sickness related metrics (Cook 2008, p. 32). Although this type of absence seems to be legitimate and is excused, it is worth to observe this employee and also always have a short talk as soon as he or she is back at work. It may help to ensure the legitimacy of the absence as well as reveal possible dissatisfaction aspects. The most important sickness related metric is the sickness rate, which represents the percentage of sickness days in a specific time period. Moreover companies are able to calculate sickness rates for different sickness lengths, e.g. sickness rates shorter than 5 days or longer than 5 days. Summing up, when calculating the sickness rate, the number of total team sickness days is divided by the number of total planned team working days.

$$\text{sickness rate} = \frac{\text{sickness days}}{\text{working days}}$$

The second essential sickness based metric is the average number of sickness days taken by an employee. It can be calculated as follows:

$$\text{average sickness days} = \frac{\text{sickness days}}{\text{employees}}$$

Developing internal performance and quality ratings (Cook 2008, p. 32) and evaluating employees according to these helps the companies to keep the motivation of the employees on a high level. The evaluations create space for employee feedback talks, where the low performance causes and employer expectations should be discussed and possible dissatisfaction reasons uncovered. Lastly the number of training days per employee (Cook 2008, p. 32) affects the employee satisfaction. Therefore not only for internal purposes trainings should be planned and carried out regularly. It is beneficial to take care of the employee, to improve his skills and provide this sort of personal development.

$$\text{average training days} = \frac{\text{training days}}{\text{employees}}$$

3.3.3. Economic indicators

During the research for metrics and models driving the business value the determination has been made that the highest focus of the present literature and scientific studies lies on studying the economic indicators. It follows from the fact that economic indicators express the value of a company very easily in monetary terms and also have “universal” character for the companies. This means that they can be applied regardless of the company field of business. The metrics and models can be calculated using pre-defined formulas mostly with no additional effort, such as development of scales and other evaluation criteria. Furthermore, economic indicators are very popular as it is of a great interest for the company stakeholders to be aware about the financial situation and at the same time the company value. Nowadays a high emphasis is put on the financial value of every company, which is confirmed by establishing finance or controlling departments responsible for accounting tasks, wages, information to the management, managing financial sources of the company, management advisory, realization of analyses and studies, taxes and so on.

The economic business value assessment metrics displayed in the Figure 7 are appropriate for evaluating eService companies as well. On that account this Section analyses them in more detail. Firstly, cash flow based performance metrics are introduced, followed by an examination of metrics where earnings or profits are central. Then the expense based and lastly the performance metrics are presented.

3.3.3.1. Discounted cash flow

According to Holler the discounted cash flow (hereafter DCF) represents the fundament for further cash flow value based evaluation methods. It calculates the market value of a company and at the same time also the shareholder value. Moreover it is relevant to underline that every cash flow based method or metric needs to take into account more periods, the best the whole life period of a company (Holler 2009, p. 30-31).

The basis of the discounted cash flow are free cash flows, i.e. free financial means, achieved by operations and investments of the company. The owners of the company have naturally the right to dispose of these financial means. In order to calculate the business value correctly, the free cash flows (hereafter FCF) of the planning and residual periods

have to be discounted by the weighted average costs of capital (hereafter WACC). Finally the corporate value (hereafter CV) can be calculated, which stands for the discounted present value of future cash flows (Holler 2009, p. 32).

$$CV_0 = \sum_{t=1}^{\infty} \frac{FCF_t}{1 + WACC_t}$$

An advantage of this method is that it works with all of the following three variables: generated cash flows, expected periods of the cash flow occurrence and uncertainty connected with them. WACC is able to reflect the risks (Carter and Ejara 2008). On the other hand a disadvantage is the complexity and the necessity to estimate the future free cash flows, which does not need to correspond to the reality (Holler 2009, p. 32).

3.3.3.2. Shareholder value added

Determining shareholder value added (hereafter SVA) is based on the previously introduced DCF method. This metric works with the assumption of currently happening performance improvements to be constant, which is considered as a disadvantage (Holler 2009, p. 32). First step of the calculation includes determining the net operating profit after tax (hereafter NOPAT). It is important to note that the costs of financing as well as interests are not included in NOPAT. Secondly, there is the need to state the employed capital together with the appropriate WACC. Capital costs are divided into cost of debt and equity financing, whereas the costs are demonstrated through desired returns of shareholders or moneylenders. The next step includes calculating the capital charge, which refers to multiplying the capital costs with the invested capital. Finally, the SVA can be determined as follows (Largani et al. 2012):

$$SVA = NOPAT - (WACC \times capital)$$

3.3.3.3. Total business return

Total business return (hereafter TBR) metric works with two key indicators, FCF and the percentage difference of company value during a time period. Using this method allows the

company to assess its relative performance and helps when fixing future targets (The Boston Consulting Group 2000).

When calculating the TBR, the return from the FCF in percentage of the market value (hereafter MV) is added to change of a company's market value in percentage, which is illustrated in the following formula:

$$TBR_t = \frac{FCF_t}{MV_{t-1}} + \frac{MV_t - MV_{t-1}}{MV_{t-1}}$$

This method does not work with individual cash flow estimations, as it is the case for the DCF method already presented. Rather equally to the SVA method it works with assuming that current performance improvements are infinitely constant. Also TBR does not take into account the change of capital cost and works with market data, which makes it only partially suitable for internal purposes (Holler 2009, p. 33).

3.3.3.4. Net present value

The next widely used method based on cash flows is the net present value (hereafter NPV). NPV stands for present value of cash flows that are discounted by the amount of expected returns and compared to the initial investment. The big advantage of this method is the possibility to compare projects including eService projects very easily. It works with the time value of money and displays clear in numbers the future cash flow as a today's value. In this sense the managers are able to choose the most valuable project by simply comparing the initial investment with the NPV of the future return. NPV is calculated as follows:

$$NPV = \sum_{n=0}^N \frac{CF_n}{(1 + DR)^n}$$

Cash flows CF of every project period are discounted by a discount rate DR and added in a consequence. Then the NPV should be compared with the initial investment in order to see whether the project will be profitable. In case the NPV value is lower than the initial investment, the project should not be run (Gallo 2014).

3.3.3.5. Discount rate

Some scientific sources focus on the discount rate as a value component having direct impact on the shareholder value (Holler 2009, p. 17). In the previously introduced economic indicators based on cash flows the discount rate plays a central role. The higher the discount rate, the lower is the present value of future returns or in other words the higher returns need to be achieved in order to cover the initial investment. Furthermore, the return needs to be higher than the cost of capital in order to be profitable. Whereas a non-corporate investor can determine the discount rate quite easily by comparing opportunity costs of capital, i.e. comparing ways of alternative investment opportunities, calculating the discount rate for corporate investors is often more difficult. Generally companies use the WACC when determining the discount rate. It considers the weighted average of all possible capital sources of a company, debt and equity financing as well as retained earnings (Schmidt 2013). The calculation of the WACC is demonstrated in the following table:

Table 7: Weighted average costs of capital

Source of capital	Amount in EUR	Amount in %	Before Tax Cost	Before Tax Weighted
Short-term debt	1.000.000	5%	3,5%	0,175%
Long-term debt	3.000.000	50%	7,0%	3,500%
Preferred stock	5.000.000	10%	7,6%	0,760%
Common stock	5.000.000	35%	9,1%	3,185%
Total				7,620%

Source: Own representation with reference to Schmidt 2013

A company having four sources of capital demonstrated in Table 7 has a WACC of 7,62%. In order to calculate it the sources of capital need to be firstly summarized and stated in monetary terms. Then their share of the total capital is built, which is in the next step multiplied by the costs before tax in order to achieve the weighted cost before tax. In the last step the weighted cost before tax are added to calculate the WACC. So a return of any investment activity needs to be higher than 7,62% in order to create business value for the shareholders (Schmidt 2013).

3.3.3.6. Residual income

Residual income (hereafter RI) is an earnings or profit based metric that can be either positive or negative, whereas on the one hand a positive result implies that additional shareholder value was created and a negative result on the other hand that shareholder value was destroyed in the analysed period. RI is equal to net earnings before interests NE^{BI} less WACC multiplied by the net assets (hereafter NA).

$$RI_t = NE_t^{BI} - WACC_t \cdot NA_{t-1}$$

Furthermore it needs to be emphasized that RI corresponds with the goal of maximizing shareholder value and can be used for calculating the corporate value CV. It is the function of NA added to future RIs, which are discounted at a risk-adjusted rate r (Holler 2009, p. 34).

$$CV_t = NA_t + \sum_{j=t+1}^{\infty} \frac{RI_j}{(1 + r_j)^j}$$

3.3.3.7. Economic value added

Economic value added (hereafter EVA) belongs to one of the most important value assessment metrics. It is based on the RI metric introduced in the previous Section and can be calculated as follows:

$$EVA_t = NOPAT_t - WACC_t \cdot Capital_{t-1}$$

Thus EVA is defined as NOPAT less the WACC multiplied with capital employed at the beginning of a period (Holler 2009, p. 34). The detailed identification of WACC is presented in Section 3.3.3.5 and the NOPAT calculation is introduced in Section 3.3.3.14. EVA has the same purpose as RI and makes clear whether a business is creating or destroying business value. Besides, the increase of EVA can be directly influenced by management decisions. Generally, the measures include earning higher profits with no extra capital, using less capital or making investments in projects with a high return. In any

case the steady increase of EVA is connected with increased market value of every company (Durant 1999).

3.3.3.8. Economic profit

Economic profit (hereafter EP) is defined as a metric measuring dollars of economic value that was built during the last year. There are basically two ways how to calculate EP. The first possibility is to take the residual income of net operating profits less the adjusted taxes known as NOPLAT. The costs of capital are subtracted from NOPLAT. The second option is to build the difference between the return on invested capital ROIC and WACC, whereas the result is then multiplied by the initially invested capital IC. Both metrics can be illustrated as follows (Holler 2009, p. 36):

$$EP_t = NOPLAT_t - WACC_t \cdot IC_{t-1} \qquad EP_t = (ROIC_t - WACC_t) \cdot IC_{t-1}$$

Attention needs to be paid to several challenges when making use of this metric. First of all it is generally used only for one specific period without showing future possibilities. Then the changes in risks and capital costs are not reflected until the calculation for the next period (Aggarwal 2001).

3.3.3.9. Cash value added

The cash value added metric (hereafter CVA) is promoted by the Boston Consulting Group. It works with inflation and depreciation and can be calculated in two ways. On the one hand it is a function of residual income of sustainable cash flows or operating gross cash flows (hereafter OGCF) less economic depreciation ED and capital costs for gross investments GI. On the other hand it can also be expressed as the difference between the cash flow return on investment CFROI and WACC multiplied by GI. CVA attracts attention because of the inflation implementation, which is its central feature (Holler 2009, p. 37-38).

$$CVA_t = OGCF_t - ED_t - WACC_t \cdot GI_{t-1} \qquad CVA_t = (CFROI - WACC_t) \cdot GI_{t-1}$$

3.3.3.10. Return on investment/assets/sales

Return on investment (hereafter ROI), return on assets (hereafter ROA) and return on sales (hereafter ROS) is a group of very powerful earnings and profit based economic metrics. For every eService provider it is relevant to know whether the business activity is profitable. ROI is calculated in an easy way following this function:

$$ROI = \frac{(revenue - cost\ of\ services\ sold)}{cost\ of\ services\ sold}$$

It is very important for the companies to understand that the cost shown in the above-illustrated calculation need to contain all relevant expenses and investments of the company. To explain the metric an assumption is made that a company is selling an eService for EUR 37,50, whereas its costs are amounting to EUR 20 and other expenses to EUR 5 for every sold item. In this case the ROI result is 50%. Every EUR a company invests according to this example earns EUR 1,50. ROI opens the possibility to compare projects and chose those with the highest result (Google 2014).

The next metric to be introduced is ROA. It expresses how much net income a company achieves per one unit of assets. The result is a percentage, but a higher result does not always stand for a better performance. It also could stand for undercapitalization or insufficient investments in assets. The following equation demonstrates, how to calculate this metric:

$$ROA = \frac{net\ income}{average\ total\ assets}$$

The period of ROA calculation is usually one year. This is also the reason why average total assets flow into the calculation (Sage Works Institute 2014).

Finally, the ROS metric represents the ratio of net income to sales (Zhuang 2005). It is often called operating profit margin. The higher is the result the better it is for the company, as in this case every additional sales unit generates more income. The formula for this metric is as follows:

$$ROS = \frac{\text{net income}}{\text{total sales}}$$

The percentage result can be interpreted as the percentage amount of profit earned for one unit of sales (Simple Studies 2014).

3.3.3.11. Operating income to assets/sales/employee

The metrics operating income to assets (hereafter OI/A), sales (hereafter OI/S) and employee (hereafter OI/E) give the proportion of operating income to each of the above-mentioned indicators (Zhuang 2005). Operating income often refers to the earnings before interests and taxes (hereafter EBIT). As the name reveals the calculation of the operating income does not include interests and taxes, i.e. the whole financial result including the expenditures and earnings from funding and investments (Betriebswirtschaft in der Praxis 2014).

An eService provider may use the EBIT to calculate further metrics that help to access the company's business value. To start a ratio of OI/A needs to be built. As companies operating in the eService field are characterized by a lower amount of assets compared for instance with companies offering physical products, there is a high probability to achieve a higher ratio of the OI/A for a company offering eServices. As a second step the ratio of OI/S should be calculated and analysed further. The result shows how much operating income is generated for every sales unit, e.g. for every EURO sold. Lastly there is the possibility to analyse the ratio of OI/E. It answers the question how much operating profit is made by every employee of the company (Zhuang 2005). The calculation of all presented metrics in this category is as follows:

$$OI/A = \frac{EBIT}{\text{total assets}}$$

$$OI/S = \frac{EBIT}{\text{total sales}}$$

$$OI/E = \frac{EBIT}{\text{total employees}}$$

3.3.3.12. Gross margin

Gross margin (hereafter GM) is a percentage metric giving the percentage difference between the sum the products are being sold to the customer and the variable costs for a company that are connected with providing them. It can be expressed in the following way (Barua et al. 2001):

$$GM = \frac{\text{total sales} - \text{total variable costs}}{\text{total sales}}$$

Especially start up companies should pay attention to this metric, as it helps to price the items correctly, achieving profits and supports business growth. It also helps the companies to point at production efficiencies and flows into the break-even-point analysis described in the next Section. Dealing with this metric on a regular basis has a long-term success potential for the companies, as they can set actions before it is too late (Beesley 2011).

3.3.3.13. Break-even-point analysis

The point where both the fixed and variable costs are identical with the total revenues is called the break-even-point. Achieving this point means that the company is neither achieving a profit nor a loss. Below the break-even-point an operating loss is achieved. Having stated that exceeding the break-even-point means profit is achieved, as it is illustrated on the Figure 10 (Kryvinska et al. 2011, Kryvinska et al. 2013).

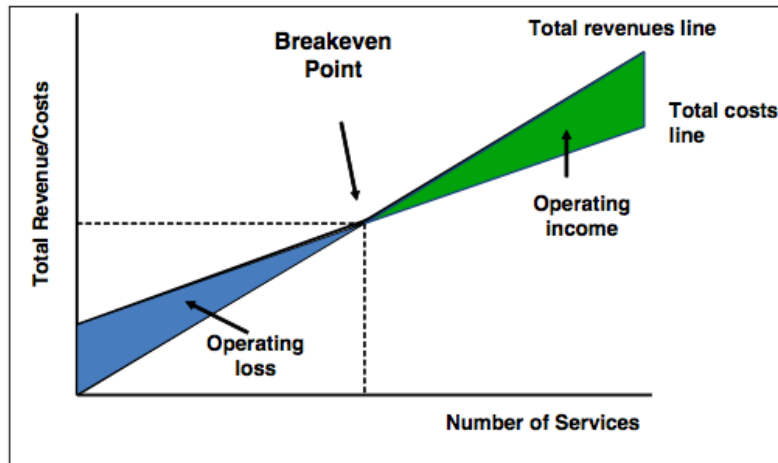
In order to calculate the break-even-quantity (hereafter BEQ), the fixed costs need to be divided by the difference between the average price of one unit and its costs. The result expresses the amount of units needed to be sold in order to cover the costs. The equation to be used is as follows (Debare 2010):

$$BEQ = \frac{\text{fixed costs}}{(\text{average unit price} - \text{average unit costs})}$$

This metric helps to answer a lot of company questions. Firstly, it shows the current profitability together with showing changes in profits in case the costs or prices change.

Also, it analyses how far sales can decrease in order to still achieve profits or how prices or volumes need to increase in order to cover higher fixed costs.

Figure 10: Break-even-point analysis



Source: Own representation with reference to Kryvinska et al. 2013

3.3.3.14. Net operating profit after tax

The calculation of NOPAT does not only directly flow into the already introduced metrics shareholder and economic value added, but is also a very good indicator of business value. It is calculated in the profit and loss statement of a company, whereas the core of its calculation is the EBIT discussed in Section 3.3.3.11. NOPAT is at the same time a good measuring tool for efficiencies, as also taxes are involved. In other words this metric focuses on the result of the company's net operations less taxes and is calculated as follows (Werner 2014, p. 151-154):

$$NOPAT = \text{operating income} \cdot (1 - \text{tax rate})$$

3.3.3.15. Debt ratio

The debt ratio (hereafter DR) is in large part a risk-connected metric. Nevertheless, it can also serve as an indicator for business value. Usually a high DR is positively correlated with higher risks, lower business value and company "health" issues. Therefore, companies should strive for reaching only a moderate manageable leverage. Though the risk connected with a high DR differs among the companies. Companies with stable revenues offering for instance physical products of daily needs can afford higher DR. But,

companies operating in the eBusiness field and offering eServices, where there is constantly necessary to meet the customer needs, come up with adaptations and cope with volatile revenues, need to be careful when making use of debt financing. When having a DR higher than one, which means that a company has higher debts than assets, most likely the company will also not create much business value in order to satisfy the stakeholders' expectations. To conclude, the DR is calculated in the following way (Investopedia 2014a):

$$DR = \frac{\text{total debt}}{\text{total assets}}$$

3.3.3.16. Cost of goods sold to sales

The metric cost of goods sold to sales (hereafter COG/S) is a part of the expense-based metrics, which are also fundamental when assessing the business value of a company (Zhuang 2015). Costs of goods sold are directly assignable to the production of goods a company is selling. In the case of eServices these costs will mostly include labour, IT-related costs such as hardware and software, moreover licencing, hosting, monitoring, IT support, customer support and any other third party costs (Cummings 2009). These costs can be compared to the sales of the company in order to receive a ratio for COG/S. A high percentage result means the difference between the costs directly connected to the production of an eService and its selling price is low. Subsequently the profit will be lower as well compared to a low COG/S ratio. Thus, this metric gives the management of every company the possibility of a deeper analysis of the production costs extent. The goal thereby is the reduction of these costs. The following way of calculation should be followed in order to receive the COG/S ratio:

$$COG/S = \frac{\text{total production costs}}{\text{sales}}$$

3.3.3.17. Selling and general administrative expenses to sales

The next expense-based metric, selling and general administrative expensed to sales (hereafter SGA/S), examines the extent of costs not directly connected with the production of the eService. These costs are mainly of a general character and include for instance costs of accounting and legal departments, but also sales and marketing. The selling costs are

classified into direct and indirect selling costs. Direct selling costs have a connection with the sold products such as credits, warranty expenses or advertising, whereas indirect selling costs cannot be assigned to the products and include for instance interests, telephone costs, postage etc. Finally, general administrative expenses refer to salaries of staff not directly involved with in the production process, rental, heating or lighting. Examining the metric SGA/S can show whether the company is operating in an efficient way or rather wasting financial resources (Investopedia 2014b). The metric is calculated as follows:

$$SGA/S = \frac{\text{selling and general administrative costs}}{\text{sales}}$$

3.3.3.18. Total operating expenses to sales

Total operating expenses to sales (hereafter OEXP/S) is a metric that literally combines the previously discussed metrics COG/S and SGA/S. This means in more detail that both cost types, production costs, selling and general administration costs, are included in the calculation (Zhuang 2005). In such a way this metric offers the opportunity to display the overall operating expenses compared to sales in percentage. Also in this case the metric shows business efficiencies of supplying eServices and is at the same time a good indicator of economical operations and business value. The lower the result the more advantageous it is for the company. To conclude the metric can be calculated in two ways. The first option is to divide the total operating expenses by the sales, whereas the second option is to add the percentage of COG/S and SGA/S.

$$OEXP/S = \frac{\text{total operating expenses}}{\text{sales}}$$

$$OEXP/S = \frac{COG}{S} + \frac{SGA}{S}$$

3.3.3.19. Cost-benefit-analysis

The last expense-based metric to be presented in this Section is the cost-benefit analysis. The goal of this metric is to investigate the costs of an investment together with the benefits in the form of payoffs. The difference between the costs and benefits indicates the

expedience of an eService project (Kryvinska et al. 2013). Some examples of eService costs and benefits are summarized in the following table (Lu and Zhang 2002):

Table 8: eService costs and benefits

eService costs	eService benefits
eService setup	Customer relationships
Maintenance	Broader market reach, global presence
Internet connection	Lower new market entry barriers
Hardware/Software	Lower new customer acquisition costs
Security costs	Reduction of information, advertising, operation
Legal issue costs	Reduction of transaction and delivery time
Trainings	Gaining information about customers
Rapid technology change	Customer and market research opportunities
	Cooperation with other companies
	Improving company image
	Realization of business strategies
	Reaching and maintaining competitive advantage

Source: Own representation with reference to Lu and Zhang 2002

Furthermore, the costs are to be interpreted as efforts needed to provide the eService throughout the whole life cycle and benefits as rewards from the implemented eService (Kryvinska 2010). An eService provider making use of the cost-benefit metric needs to state the cost and benefits for the particular eService in the first place. Then the stated costs and benefits need to be expressed in monetary terms. This task is very critical as it is often based upon a subjective evaluation and estimation. In order to finish this task properly it should be conducted involving other stakeholders as well for a deeper analysis and discussion mostly for the intangible categories. In the last step, the sum of the costs and benefits needs to be compared and next action points should be determined. In the case the costs are higher than the benefits an eService provider may take steps to cut the costs or increase the benefits in order to achieve benefits that outweigh the costs (Mind Tools 2014).

3.3.3.20. Productivity

According to several scientific studies, investments in the field of IT are able to significantly improve the productivity. But, the differences between the productivity of various eService companies may reach high levels (Schryen 2010). This is the reason why every eService provider should be aware of its own productivity and calculate it within the framework of the performance metrics. However, performing a productivity calculation is

not an easy task for such complex area as eServices are. Besides of this, every eService provider has to implement an own calculation depending on the offered eService. For instance the calculation of productivity should include output figures, such as output quantity and quality. The output quantity includes the number of served requests, which can include the number of passed eLearning courses, carried out eBanking financial transactions or sent administrative office forms on an eGovernment platform, whereas it is crucial to include the quality as well. Performing higher than other eService providers, but having at the same time also a very high error rate does not stand for a high productivity. Then output figures also on the internal level should be taken into account to ensure that the internal productivity is high and the internal processes are efficient (Biege et al. 2013). To sum up, the productivity measure is a very important tool to calculate, as it has a substantial impact on the business value.

3.3.3.21. Delivery cycle time

The performance of an eService provider can usually be measured also in the delivery cycle time. It measures the time between receiving an order and delivering the eService to the customer (Barua et al. 2001). Normally the delivery cycle time for eServices will be very low, as they are delivered online and often instantly. However the delivery cycle time can be prolonged through unexpected errors. These can occur for instance during the payment procedure or eService delivery. As the expectation of the customers in to make the use of an eService immediately without wait times, the goal of every eService provider is to achieve the lowest possible delivery time and eliminate the error occurrence at the same time. A higher delivery cycle time is in turn connected with a higher business value and is calculated as follows:

$$\text{delivery cycle time} = \text{wait time} + \text{throughput time}$$

3.3.3.22. Number of incorrect order fulfilments

Various errors are able to affect directly the number of incorrect order fulfilments. The more incorrect order fulfilments are tracked, the more does also the company's performance suffer. But not only that, also the customer satisfaction is decreasing together with a higher amount of incorrectly fulfilled orders. As already analysed further in a

consequence the revenues are shrinking as well. Furthermore, the eService providers need to cope with higher costs for order corrections. For this reason the rate of incorrect order fulfilments should be kept on low levels to support the company targets. It is calculated as follows:

$$\text{incorrect order fulfilment ratio} = \frac{\text{incorrectly fulfilled orders}}{\text{total orders}}$$

3.3.4. Assessment models

The methods and metrics used for business value assessment of eServices through measuring eService quality, customer satisfaction, employee satisfaction and calculating several economic indicators led to the development of many assessment models. The goals of these assessment models differ. Some of them are focusing on the assessment of one particular eService, others tend to provide general assessment tools or allow performing an ex-ante or ex-post analysis. On the basis of the research performed within this master thesis, a conclusion can be made that the development of such eService assessment models was a core problem setting of many scientific studies. To gain an overview about the most influential eService assessment models established, this Section is divided into four parts. The first part introduces the well-known balanced scorecard approach that is adapted to be used for eServices. It consists of four separate categories necessary to be assessed in order to maximize the business value. Secondly, an integrated value assessment framework established by Liu et al. 2008 is presented. It takes into account several value perspectives and the specific stakeholder targets. Then the value measurement methodology is demonstrated in the third part. It is relying on the assessment of five critical value factors and additionally also the risk. Lastly the modified SERVQUAL-method is introduced, which examines the quality of an eService.

3.3.4.1. Balanced Scorecard

The balanced scorecard (hereafter BSC) is a performance-based approach, which was not originally developed for the evaluation of eServices. But, as it connects more evaluation perspectives including financial and non-financial indicators it seems to be suitable for the eServices evaluation as well and is being used in this field for several years (Van Grembergen and Amelinckx 2002). It helps to evaluate whether the eService is cost-

efficient, fulfilling the targets set by the stakeholders and used effectively by all participants involved. Furthermore, it opens the possibility to improve the internal and external processes (Alhyari et al. 2013). The BSC approach consists of four perspectives: customer orientation, business contribution, operational excellence and future orientation. All of these perspectives include three layers: mission, objectives and measures. It is very important to adapt the BSC to the own business case and repeat it on a regular basis (Van Grembergen and Amelinckx 2002).

Customer orientation, the first perspective, could include the mission to become the preferred eService provider. This mission should be achieved for instance through customer satisfaction, retention, gaining new customers as well as powerful marketing activities. Table 9 summarizes the measures for customer orientation as proposed by Van Grembergen and Amelinckx. The list of measures is not complete, moreover the metrics should be chosen according to the eServices character (Van Grembergen and Amelinckx 2002).

Table 9: Customer orientation metrics

Objective	Metrics
Customer satisfaction	Online surveys
	No. of customer complaints
Customer retention	% of customers with repeating orders
Gaining new customers	No. of new customers acquired by the own web site
	Sales directly/indirectly acquired through the own web
Powerful marketing	No. of hits, page impressions, site visits, visitors

Source: Own representation with reference to Van Grembergen and Amelinckx 2002

Table 10: Business contribution metrics

Objective	Metrics
Budget conformity	Comparison of the desired forecasted budget with the actual expenditures
Business plan achievements	Fulfilment of the business plan steps
Economic business value contribution	Profitability
	Return on investment
	Cost reductions of addressing new customers, customer relationship management and marketing activities

Source: Own representation with reference to Van Grembergen and Amelinckx 2002

The second perspective stands for the business contribution, where the mission should focus on enabling and contributing to the stated targets and business plans. The objectives could include budget conformity, achievements of business plans or economic business

value contribution. Table 10 presents the metrics suitable for the assessment of this perspective (Van Grembergen and Amelinckx 2002).

The third category includes the operational excellence, which expresses the key elements an eService needs to fulfil in order to increase the customer satisfaction and reach the stakeholders' targets. The mission of this category is to provide the best possible eService according to the agreed targets. Thus, the eService needs to fulfil the purpose, be available, secure, but also the provider needs to work on improvements of the particular eService in order to remain competitive and demanded (Van Grembergen and Amelinckx 2002). Suitable measurement tools are as follows:

Table 11: Operational excellence metrics

Objective	Metrics
eService fulfilment	Timely delivery
	No. of problematic customer orders
eService availability	Average availability of the system
	Average outage time
	Maximum outage time
Security	No. of security issues in internal/external audits
	No. of unrecoverable security errors
eService improvement	Average upgrade time of an eService

Source: Own representation with reference to Van Grembergen and Amelinckx 2002

Table 12: Future orientation metrics and models

Objective	Metrics and models
Trained developers	No. of training days
	Expertise
	Knowledge of new software and technologies
Staff management	Absence rate
	Average workload
	Employee satisfaction rate
Independence of external consultants	No. of external consultant days
Monitoring software	No. of yearly releases
	No. of software additions
	No. of new customers

Source: Own representation with reference to Van Grembergen and Amelinckx 2002

The last category that closes the balanced scorecard eService evaluation is the so-called future orientation. In the eService field it is inevitable to focus on the future development, adaptations and changes of the eService, as the conditions on the market together with

customer preferences are changing very quickly. This perspective analyses all the necessary modifications needed to satisfy the stakeholders in a long run. The eService company needs to ensure to have proper trained developers, reach independency of external consultants, manage the staff effectively and monitor the external software vendors the eService providers is dependent from when using external software applications (Van Grembergen and Amelinckx 2002). Table 12 shows the metrics and models to be used in this last category.

It needs to be pointed out that the BSC approach is an appropriate framework for assessing eServices. Often eService providers start the business without a clear business plan. For this reason the results of the metrics and methods used in the BSC categories are able to analyse the business from more perspectives and also show the areas that need to be improved (Van Grembergen and Amelinckx 2002).

3.3.4.2. Integrated value assessment framework

Based on a set of value assessment tools, Liu et al. 2008 established an integrated value assessment framework suitable for the evaluation of eServices. This framework follows a top-down approach and consists of three levels: value categories, key performance areas (KPAs) and key performance indicators (KPIs). First of all, the value categories require to be explained. Financial value measures the impact on income, assets or debts. Then social value stands for the impact on the whole society and operational value on internal operations and processes. Finally, the last value category, strategic value, is implemented to measure the company's impact on government, policies or public opinions. For the company targets having a positive impact on the satisfaction of stakeholders as well as customers, suitable key performance areas are developed. These are in the following assessed through specific key performance indicators that need to be designed to fit the key performance areas and to be defined correctly in terms of the target they are measuring, assessment period, measurement unit and a detailed description about the calculation and data collection (Liu et al. 2008). Figure 11 illustrates the connections between all three mentioned levels. The value cube consists of the four value categories explained in-depth above. For each of these value categories and specific goals areas stated by the stakeholders, key performance areas are developed. The next step is then to assign suitable key performance indicators to the key performance areas that can be used for assessment

purposes. Furthermore the illustration is not finite, as the same scheme has to be repeated for every stakeholder and his particular goal areas (Liu et al. 2008).

Figure 11: Value cube for the integrated value assessment framework



Source: Own representation with reference to Liu et al. 2008

3.3.4.3. Value measurement methodology

The USA Social Security Administration (hereafter SSA) together with the consulting company Booz Allen Hamilton developed a comprehensive business value assessment model called value measurement methodology (hereafter VMM). It is made up of three levels, the decision framework and performance and cost estimation. The decision framework consists of five spheres together with a risk factor. What is necessary also in this kind of evaluation is to use it in the context of the offered eService. The method was launched with the purpose of not only assessing the eService itself, but also its environment in order to make a constant progress. Furthermore, it was developed in a way that ensures a smooth top-down and bottom-up communication between all management levels. Such a communication flow is necessary to pass the strategic information to lower management and the information about the value to the top management. In the following all three levels of VMM are presented. Firstly, Figure 12 illustrates the categories of the decision framework (SSA and Booz Allen Hamilton 2002).

When measuring the direct customer value, the eService provider needs to know the customer needs and demands. Then appropriate metrics and methods can be used for the calculation of direct customer value. For instance when the customer demand is to have

access to the eService outside of the business hours, the right assessment way would include calculating the access percentage during such hours. Are the customers looking for an easy access, a clickstream analysis should be conducted. Besides of this, VMM works with the value of customer time, which can be expressed either as time saved or in monetary terms. However, there exist another costs with a saving potential that increase the customer value, such as fuel costs or postage. Furthermore, the customer value can be determined by the customer willingness to pay. In order to express it the potential customers should be surveyed about the amount they would pay for an eService that has not been launched yet. Lastly this approach recommends performing customer surveys to get a better knowledge about what do the user want, how they evaluate the eService performance and what value they currently perceive (SSA and Booz Allen Hamilton 2002).

Figure 12: Categories of value measurement methodology



Source: Own representation with reference to SSA and Booz Allen Hamilton 2002

Social value is to be measured in VMM as well and refers to a value not directly connected to eService users or the eService provider, but rather other parties or institutions concerned. Ignoring the social value would lead to creating an eService that does not reflect the social demands and interests. To name a few examples, social value could include increased service effectiveness, privacy, security, easier access to information, improved economic indicator or reduced waste (SSA and Booz Allen Hamilton 2002).

The third category includes the financial value that is generated through the eService. In more detail this value includes cost savings and cost avoidance, which can be commonly calculated also through ROI. Both cost types are measured in the most accurate way when

comparing the eService solution with a currently dominantly used alternative. Some examples of cost savings and cost avoidance achievable when launching an eService are summarized in the Table 13 (SSA and Booz Allen Hamilton 2002).

Table 13: Cost savings and cost avoidance of eServices

Cost savings	Cost avoidance
Personal costs	Additional facilities to serve increased
Postage, printing costs	Additional operational costs to serve demand
Operations of physical facilities	
Shut-down of out-to-date systems	IT costs due to introducing scalable
Market entry	Standardization
Customer relationship management	Outsourcing

Source: Own representation with reference to SSA and Booz Allen Hamilton 2002, Rust and Kannan 2002

When implementing an eService solution, the provider is able to save postage, printing and personal costs, as less staff is needed to run the operations. Moreover operational costs when providing eServices require fewer funds due to less physical facilities required. Because of IT specialists needed, it is typical that out-to-date systems are being switched off and newer solutions are used further. For an eService provider it is also easier to enter new markets, as potential customers can be addressed worldwide much easier. As a consequence the customer relationship management saves costs as well due to a huge amount of collected information. On the other hand costs can also be completely avoided through an eService implementation. This is the case, when increased demand is satisfied through eServices and costs for additional facilities and operations are not needed. Furthermore, eServices should consist of scalable systems to reach cost avoidance also in this area. Finally, standardization of hardware, software or processes together with outsourcing contributes positively to cost avoidance as well (SSA and Booz Allen Hamilton 2002).

Operational and foundational value is the forth part of VMM and focuses on the operational improvement of an eService itself and its future adaptation requirements to satisfy future demand. In order to choose appropriate metrics for operational and foundational values the eService provider has to have an extensive understanding about the users, own processes, productivity, quality and used resources from both the current and future perspectives. Metrics for operational values include for instance the percentage of new users, error rates, evaluation of process complexity, cost and time saved or increased productivity, while metrics for foundational value combine future capacity development

together with educating personnel to be able to cope with future challenges (SSA and Booz Allen Hamilton 2002).

In the fifth stage the strategic and political values are measured. The core of this category is the company's mission, because the value is measured by comparing the performance of an eService with the company objectives and targets, whereas the view of already presented value categories might be included as well. When the eService provider is reaching the highest possible strategic and political value, both internal and external company objectives are fulfilled. In other words, the higher is the percentage of reached company objectives, the higher is also the business value (SSA and Booz Allen Hamilton 2002).

Finally, VMM works with the risk factor in the last stage of the evaluation process. On the one hand risk should be taken into account when developing the eService project, but also later during its life cycle. The risk should lie in the predefined tolerance range. Relevant for eServices are project risks, such as implementation, management, political or legal risks, but also organizational risks, such as internal process and operations, skills or funding. Lastly, technical risks are connected with eService. They include security, privacy, complexity, feasibility or functional risks (SSA and Booz Allen Hamilton 2002).

The described decision framework is the basis of VMM. The concrete value factors to measure in each category are carefully set by the management to go hand in hand with the company targets and desired outputs. Next, the performance and cost estimation needs to take place, which equals to estimating the costs and benefits of an eService alternative. In order to conduct such a cost-benefit analysis, the predicted and actual costs and benefits need to be assessed. Due to the fact that such an assessment is a very complex task, costs might be underestimated and benefits overestimated. To overcome this challenge, eService providers are advised to work with ranges or with any additional information able to refine the estimations and to deal with uncertainties in form of using scenario techniques. At the end the business value created by the eService initiative can be calculated in monetary terms (SSA and Booz Allen Hamilton 2002).

3.3.4.4. Modified SERVQUAL method

Extensive research has been conducted in the eService quality field (Li and Suomi 2009; Collier and Bienstock 2006). The basis for this research includes the so-called SERVQUAL model, which is one of the first quality assessment models. However, it was developed for the assessment of traditional services and is thus not fully suitable for the evaluation of eServices. The primary dimensions of SERVQUAL included tangibles, responsiveness, reliability, assurance and empathy (Collier and Bienstock 2006). When comparing the traditional SERVQUAL and the possibilities to use it also for eServices, three problem areas are evident. First of all, in the case of eServices, no sales staff is present. Secondly, due to this fact, eServices have a self-service character and thirdly the typical tangible aspect is missing (Li and Suomi 2009). These findings prove that in order to use SERVQUAL for eServices, an adaptation of the assessment dimensions is absolutely necessary. As it becomes evident, the developed eService quality models include some already presented evaluation dimensions from Section 3.2.1., where the evaluation of eService features and functions was reviewed. But the models presented in this Section propose rather applying a set of metrics to measure the relevant assessment categories and do not focus on single quality assessment elements.

Parasuraman et al. 2005 conducted a study about the relevant eService quality assessment categories and came up with a framework called E-S-QUAL, which was also empirically supported by carrying out a survey. The results show that the highest impact on eService quality, but also on perceived value by the customers and in turn customer loyalty, have the following seven quality categories: efficiency, fulfilment, availability, security, responsiveness, compensation and contact (Parasuraman et al. 2005). Except of the last three categories, the detailed descriptions are to be found in Section 3.2.1. Responsiveness, compensation and contact refer to exceptional situations, such as problems and errors. Responsiveness measures the handling of customer problems, compensation the ability of the eService provider to take care of customer problems and contact the support of employees (Yaya et al. 2012).

Li and Suomi 2009 analysed the major studies focusing on the eService quality assessment and established an own assessment framework based on the advantages of the examined studies. Table 14 shows the quality assessment dimensions developed by Li and Suomi

2009 together with their targets. Depending on the targets an eService provider is focusing on, suitable metrics need to be chosen for the particular eService (Li and Suomi 2009).

Table 14: Dimensions for eService quality assessment

Dimensions	Targets
Website design	Attractive and well structured website and user interface, easy download process and transaction
Reliability	Accuracy, completeness, company truthfulness, correctness, promise keeping, availability
Responsiveness	Correct contact information, response time, problem solving
Security	Protection of customer personal and payment information, reputation, company terms and conditions
Fulfilment	Correct information, transaction processes, delivery promises, during the purchasing process
Personalization	Individual eServices and their design, payment and delivery terms
Information	Timely, current, accurate, relevant, easy to understand information
Empathy	Engagement, friendliness, courtesy

Source: Own representation with reference to Li and Suomi 2009

The modified SERVQUAL, E-S-QUAL frameworks as well as the dimensions for eService quality assessment developed by Li and Suomi 2009 maximize the business value, customer satisfaction and loyalty once they are applied in practice. Therefore, they are considered to be a great help for companies introducing or already offering eServices. Moreover, they help to understand the quality of an eService and the aspects necessary to consider when meeting customer needs and increasing profits (Li and Suomi 2009).

4. SWOT-analysis

4.1. Purpose and general description

The purpose of the SWOT-analysis carried out in this Section is to analyse further the parts of the already presented business value assessment framework. First of all the analysis shows their differences and opens comparison possibilities. More than this, the calculated business value in the fields of the eService features and functions, customer satisfaction, employee satisfaction and economical indicators is analysed using SWOT in terms of their strengths, weaknesses, opportunities and threats. The analysis is applied for each of these categories in order to deliver the result about the validity of the calculated business value and a general recommendation about the application in practice. Also, the next purpose is to show according to the SWOT-analysis whether the strengths and weaknesses as well as opportunities and threads of a single assessment field can be balanced or whether it is more beneficial for the company to outweigh them applying the whole assessment framework.

4.2. SWOT-analysis in general

Before the application of the SWOT-analysis on the assessment framework, it is necessary to outline this tool in general. It is widely used and very popular because of its simplicity and focus on the value it delivers, which is always connected with a problem the company is investigating. Namely, the major issues of such a problem setting are examined in detail both internally and externally. Moreover, the result helps to show necessary future actions in order to reach the company goals, but also when relevant to show the need for using further analysis tools. Generally, it is recommended to involve more independent experts or concerned employees into this analysis to deliver a more practical result. When it is not possible the result is likely to take one person's stand and be in turn not objective enough.

The process of a SWOT-analysis starts with choosing a person or a group of individuals responsible for the problem area. As already underlined, the more concerned individuals are performing the analysis, the more accurate results are delivered. Then the process continues with the assessment of the strengths and weaknesses based on the company's internal situation. Thus, they are under control and can be directly influenced by the company. The strengths refer to positive characteristics of a company that are able to

positively contribute to the goal achievement and include elements such as core competencies, resources or skills. On the other hand weaknesses can be described as negative internal features that do not contribute to the goal achievement and to which a company should pay extra attention to. Often internal measures can be taken to turn the weaknesses into strengths. A common problem connected with the assessment of strengths and weaknesses is the split of the different internal company attributes into the correct category. When these attributes are not defined precisely enough the company can have problems to determine whether a particular attribute is a company strength or weakness. The third step of a SWOT-analysis is the assessment of opportunities and threats. These both categories are external to the company and are not to be influenced by the company itself. This means that a company cannot influence the opportunities or threats on its own, because they are mostly influenced by the competitors and other macro environmental factors. Opportunities are in this sense external factors that are able to positively influence the company targets or problem areas examined. In contrast threats can negatively influence the targets and are as well not directly controllable. Therefore, a company should focus on strategies where the threats are minimal and the opportunities can be maximized (Damian et al. 2014).

4.3. SWOT-analysis for eService business value assessment framework

This Section focuses on the SWOT-analysis of all parts of the business value assessment framework presented in previous Sections of this master thesis and is for this reason divided into four main and a conclusion part. Each of the four parts consists of an individually carried out SWOT-analysis, which examines the internal strengths and weaknesses and external opportunities and threats of the framework part itself on the one hand and the direct impact on the business value assessment calculation on the other hand. Furthermore, the result of the SWOT analysis shows whether the business value calculation through the proposed parts of the framework is able to deliver a valid business value and also what are the areas a company needs to focus on in order to improve the calculation. It is necessary to stress that all four SWOT-analyses are graphically presented as well and that the graphic summary shows both problem areas examined. In order to distinguish them, factors describing the parts of the framework in general are displayed in an orange colour, whereas factors demonstrating the impact on the business value calculation and the result validity are presented in a blue colour.

4.3.1. SWOT-analysis for the assessment of eServices features and functions

The assessment of the eService features and functions is the most complex part of the framework, as eServices and their delivery have many facets to investigate (Lu et al. 2007, p. 16-19). In the following the analysis of the four SWOT categories is conducted for this framework part and relevant factors are derived. The discussed factors either describe the framework part in general or have a significant impact on the variables that are a part of the business value assessment and in this sense also on the calculated business value result.

The focus on the eService itself is considered to be a strength of this framework part. Moreover, the eService is evaluated in terms of many relevant categories, which make it possible to show the overall performance of the eService together with possible improvement areas (Stiglingh 2014). For some eService kinds the performance evaluation is the best way of calculating the business value. This applies to both eGovernment and obligatory eLearning courses, where the provider needs to ensure an economically efficient launch, but later the success is not measured on the basis of profits or earnings. On the contrary various metrics and models analysing the performance of an eService seem to be more beneficial when it comes to measuring their value. Concerning the validity of the calculation, the features and functions of an eService are mostly to be influenced by the eService provider. The provider has a direct impact on the design, functionality, reliability and more other aspects of the eService using internal resources. When taking into account the presented metrics and methods, in this kind of business value assessment, the provider has a direct impact on e.g. the eService fulfilment, ease of use, accurate delivery, completeness and truthfulness of the order as well as the employee performance (Nath and Singh 2010, Stiglingh 2014). Thus, these kinds of data, also known as primary data, are a valid input of the business value assessment and are generally not subject to distortions. Also these aspects can be directly influenced and improved by the eService provider so as to increase the business value. Then, the next strength of a very similar art is the presence of many electronically stored data that flow from the business operations. There are numerous examples of it, such as the presence of many user data not typically collected when offering traditional services. Therefore, the provider can easily use and evaluate this data for calculating business value, for instance using the introduced metrics latency, meeting customer request dates or loyalty. The access to these data is very easy and

provides a very good starting point for valid calculations (Nath and Singh 2010, Schneiderman 1996).

Lack of economic focus is a part of the internal weakness. Although, the eService is analysed in detail, there is no information given about its economic success and profits a company is realizing when selling it. But, the information about the economic situation of a company is still one of the most relevant indicators for business value from the shareholders' point of view (Holler 2009, p. 17-18). Naturally this does not apply for all kinds of eServices. As already shown, it makes more sense for the provider of eGovernment or eLearning services to use the performance metrics and models to calculate the business value. However, commercial eServices need to be measured in terms of their economic success as well. Targeting exclusively the eService features and function during the business value assessment comes along with another problems. Namely, the customer and employee satisfaction is undervalued. Thus, no conclusions can be drawn about necessary improvement areas coming directly from customers and employees. Both are a very valuable source of information (Graf and Maas 2014, p. 61- 63, Heskett et al. 1994). The internal weaknesses having impact on the calculation validity consist of internal factors that are under several circumstances not directly controllable by the provider. Technical equipment, such as hardware, software, network or own servers might break down and not work according to their purpose. This situation can occur independently from performing pre-testing, maintenance or back-ups in pre-defined time intervals, expanding the network or server capacities or switching to new and better solutions, which include new hardware, software updates or new software. For this reason the business value calculation is negatively influenced by such unpredictable and uncontrollable incidents and the final value result is lower. Also there is generally challenging to express the business value based on features and functions of an eService in monetary terms and the eService providers could struggle with this task (Tambe 2014b).

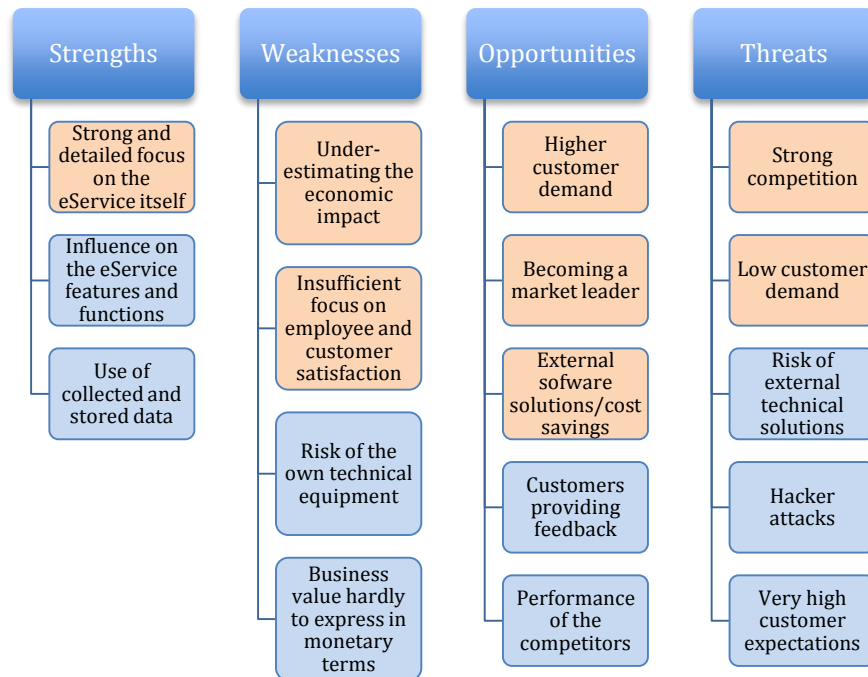
Concerns in the field of the eService performance are able to contribute to a higher customer demand. Applying the already presented metrics in this field is a very advantageous approach when achieving a constant progress of the eService is desired (Stiglingh 2014). As the competition is usually high, constant adaptations and improvements of the eService are necessary in order to remain competitive (Sheth and Sharma 2007). But these efforts usually have a positive influence on the customer demand

and when completed successfully also on reaching a market leader position. Also they contribute to changing customer habits and making them switching to an eService solution. Both mentioned factors are part of the external opportunities. Furthermore the eService provider can snap at the chance to use the external software solutions that would in this case help to improve the eService and its performance. Moreover, such solutions could cut internal costs as well. Looking at the results validity, customers that are willing to provide own feedback about the eService are considered to be an external opportunity for the eService provider. They can come up with very interesting and useful insights and improvement suggestions that directly flow in several metrics and models calculating the business value of the features and functions of an eService. These include for instance the system usability, information quality or the reduction of effort (Nath and Singh 2010, Sauro 2011a, Stiglingh 2014). The more feedbacks an eService provider can collect, the more accurate are also the calculations. Comparison with another alternatives is an approach that helps deriving business value. So another opportunity for the provider is the performance of the competitors. When the performance of the competitor is lower for instance in terms of time and costs, the own business value will rise (Stiglingh 2014). Depending on the current situation, the competitor's performance might also be a threat in a case the company has a very strong competitor with a competitive advantage.

Finally, there are several external threats in this category that might have a negative impact on the overall evaluation tool as well as business value calculation. Generally speaking despite of putting high efforts on the assessment of eService features and functions, the competitors might come up with better offerings and be for this reason preferred by the customers. First threat connected with the result validity is of a similar character than the discussed internal weakness in form of technical equipment. An eService provider often relies on external technical solutions. It uses the services of an Internet provider, hotline provider and possibly also outsources software or servers. Errors occurring in this field have a significant negative impact on the own business value although caused externally. The next issue is connected with security. Despite the fact that an eService provider may ensure the highest possible security and meet all relevant security standards, there is always a threat of being the target of hackers (Nath and Singh 2010). The last threat to be mentioned is coming from the customers of the eService provider. In some cases the customer expectations are very high and even impossible to fulfil. For instance the customer request dates might be very short in case of tailor-made eServices. Thus, the

calculation of a metric such as customer request dates met would be very low, although the actual performance of the eService provider in this field would be very high or even better than in the case of the competitors. Figure 13 summarizes the SWOT-analysis in this category.

Figure 13: SWOT-analysis for the assessment of eServices features and functions



Source: Own representation with reference to Graf and Maas 2014 p. 61- 63, Heskett et al. 1994, Lu et al. 2007 p. 16-19, Nath and Singh 2010, Sheth and Sharma 2007, Stiglingh 2014, Schneiderman 1996, Tambe 2014b

4.3.2. SWOT-analysis for the assessment of customer satisfaction

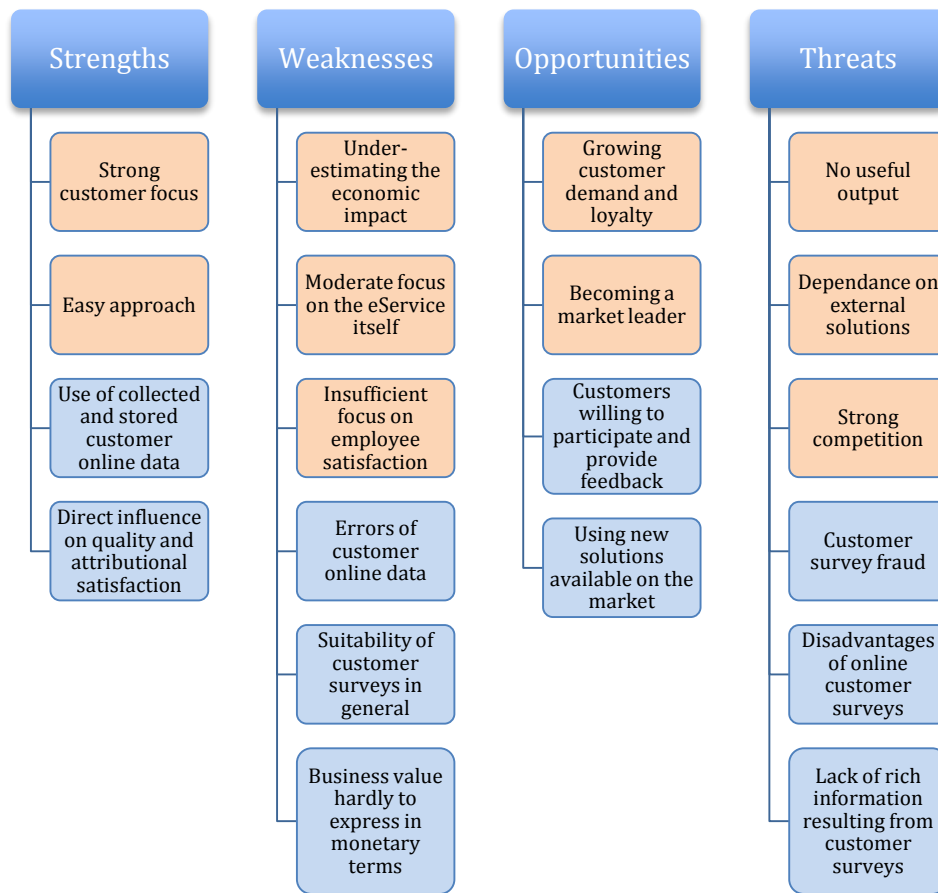
This Section presents the SWOT-analysis focusing on the second part of the business value assessment framework - the customer satisfaction. The goal of this Section is to analyse closely this part in general terms as well as the variables of the customer satisfaction evaluation and answer the question: which factors positively contribute to the validity, and which on the other hand to distortions of the results.

First of all, the assessment of customer satisfaction puts the customer in the midpoint of the examination, which is a strength of this assessment part. To be more specific a strong focus of this assessment part is put on tools measuring the customer satisfaction as well as analysing customer data collected online. This leads to defining possibilities to increase the

customer satisfaction. Moreover, the presented tools and metrics evaluating online data are easy to apply. Hence such an approach should be systematically adopted. The validity of the calculation is ensured through working with stored customer data that are easily to collect and analyse for the customer satisfaction assessment purposes. Working with such primary collected data is advantageous in any case (Hartjes 2009, p. 69-90). The findings of two of the main customer satisfaction elements, namely perceived quality and attributional satisfaction, might be crosschecked with the results of metrics and models suitable for the assessment of the eService features and functions in order to make a statement about their validity.

Customer satisfaction assessment is at the same time connected with several weaknesses. At first it is underestimating the economic impact that is discussed further in the previous Section (Holler 2009, p. 17-18). What is more, there is only a moderate focus on the eService itself, while the customer plays a central role. It needs to be pointed out that perceived quality and attributional satisfaction that are examined in customer surveys, focus groups or are observed, are able to indirectly assess the eService to a certain extent (Ciotti 2013). In addition, similar outcome is achieved for employee satisfaction that is assessed insufficiently, where at most some selected attributes come out from customer feedbacks. Attention should be paid to the results validity as well. It is common that in one household one computer is used by more persons and that the cookies are deleted between the visits. This also happens vice versa, i.e. one person is using more computers and devices or even more browsers. This is only one example to demonstrate that the collected data need to be used carefully and when possible such error should be eliminated. Due to such data errors some metrics could become invalid. To name a few, the metric showing the percentage of unique, loyal and repeated customers could become problematic (Hartjes 2009, p. 69-90). The next problem area is the suitability of customer surveys for the business value assessment in terms of the validity in general. The customer answers might not be serious in all cases and deliver new insights and information for the eService provider (Sincero 2012). Actually, they could be even risky for the company creativity and turn its focus on minor issues that will not work in a long run. Thus, every eService provider needs to decide whether to stick to this method, use another more reliable methods instead or a combination of them. Finally, the metrics and models in this category are generally not easily expressed in monetary terms, which make it complicated to determine the business value (Tambe 2014b).

Figure 14: SWOT-analysis for the assessment of customer satisfaction



Source: Own representation with reference to Ciotti 2013, Hartjes 2009 p. 69-90, Holler 2009, p. 17-18, Sincero 2012, Tambe 2014b

Due to the strong customer focus, the most important opportunity refers to a growth of customer demand and building customer loyalty. This has a direct connection to the improvement of the own market position or even to the chance of becoming a market leader. The opportunity for the evaluation validity is to survey customers that are willing to participate and provide a serious feedback. In such a way customers can make a valuable statement about the quality, loyalty, attributional satisfaction and intension to repurchase (Ciotti 2013). Another opportunity is to make the use of external solutions suitable for the customer satisfaction evaluation, such as specialized software to track and calculate all necessary online customer data.

The threats comprise of receiving useless output from the customers or facing a strong competition, so that also a high customer focus is not leading to a higher business value. Depending on external solutions when assessing the online customer data is risky unless it is ensured that the solution is trustworthy and reliable. Customer survey fraud and survey

participants providing not a serious and useful feedback, are considered to be a threat for this kind of assessment. A general disadvantage of online customer surveys used for evaluating eServices is the absence of an interviewer, who is able to lead the conversation, contribute to more truthful answers and help with explanations when needed. Finally surveys deliver only numbers and often not the rich information that could help to come up with creative solutions and gain a competitive advantage (Sincero 2012). To conclude, Figure 14 presents the SWOT-analysis of the customer satisfaction assessment.

4.3.3. SWOT-analysis for the assessment of employee satisfaction

The third part of the business value assessment framework focuses on the assessment of employee satisfaction. An internal strength includes the clear focus on the employees as drivers of business value. Then the assessment is easy to conduct, as employees are part of the company and are for this reason also easily accessible. Advantageous is also the easily applicable observation of employees with regard to the interactions between the supervisor and the employee or employee performance. The outputs of employee surveys, focus groups, or observations are in general valid information sources. The reason is that employees themselves are interested and often willing to participate in surveys in order to express their own opinions. Therefore, the information received from them in respect to the job itself, their satisfaction or improvement suggestions are considered to be valuable information and at the same time a valid input for the employee satisfaction assessment (Townsend et al. 2007). Next to surveying employees, the eService provider has the opportunity to analyse further data that are collected about an employee, such as data associated with absence, sickness, training days or fluctuation (Cook 2008, p. 32).

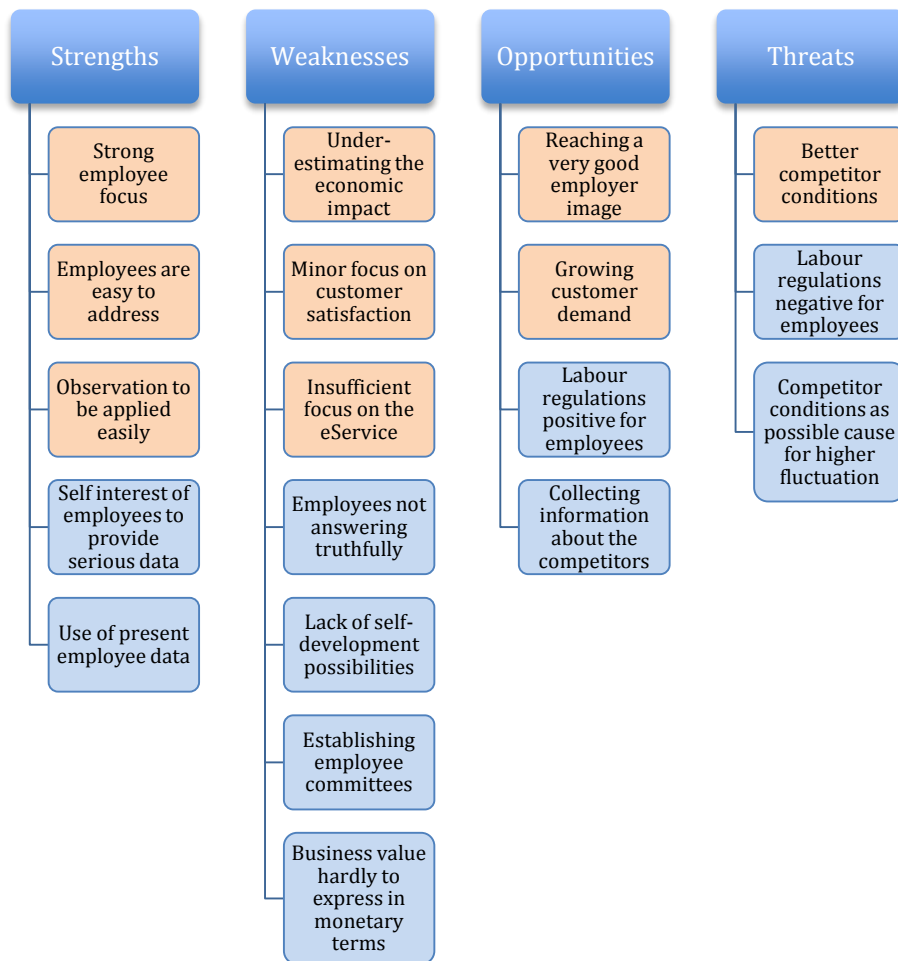
For this assessment part the weakness of a low economic focus needs to be mentioned as well (Holler 2009, p. 17-18). At the same time an insufficient significance is put on the eService functionality and only a minor one on customer satisfaction. The last mentioned increases after a good reputation of an eService provider in terms of the employee care is earned. Several weaknesses have also a direct impact on the result validity, such as surveying employees in topics, where they do not want to provide serious feedback. For instance employees giving negative feedbacks about a direct supervisor could be afraid of doing so in order to maintain the job position. However, this weakness could be minimized after ensuring a complete anonymity of the survey. The next weakness is the fact that not

all companies are able to provide self-development possibilities to the employees, which is considered to be one of the most relevant objectives when motivating the employees and increasing their satisfaction (Townsend et al. 2007). Although the establishment of employee committees is advantageous in the long run as already demonstrated, most companies are sceptical towards them. It is also questionable whether they really contribute to employee satisfaction (Sammer 2012). Also for this assessment part, companies might find it challenging to express the business value in monetary terms (Tambe 2014b).

When employee satisfaction is part of a systematic assessment, the provider has the opportunity of reaching a very good employee image. This is beneficial also for increasing the customer interest in the own company and the possibility of growing the demand. The variables of metrics and models in the field of employee satisfaction are also directly influenced by the law of the particular country. To be more specific there are regulations in the labour legislation about the payment of sickness days or about the termination of an employee in case of his absence. These regulations are classified as external opportunities for the company. For instance in countries where the sickness days are not fully financially covered by the company, the sickness rates will probably be lower and sickness days shorter. Besides of this, it could also have a direct impact on the absence of the employees. Another opportunity in this sphere is the collection of information about the competitors in order to come up with better conditions internally.

The assessment of employee satisfaction also hides some threats. It is possible, that the competitors have better conditions. Then the law regulations may have a negative influence on the employees. To take the same example as presented for the opportunities of assessing employee satisfaction, the employees would be much more satisfied when the regulations would be more favourable, i.e. when for instance the sickness rates would be fully paid. Also better conditions by the competitors could indirectly increase the fluctuation rate of the employees. These both factors contribute in this sense externally to distortions of the business value calculation. Figure 15 illustrates the relevant factors of the SWOT-analysis for this business value assessment part.

Figure 15: SWOT-analysis for the assessment of employee satisfaction



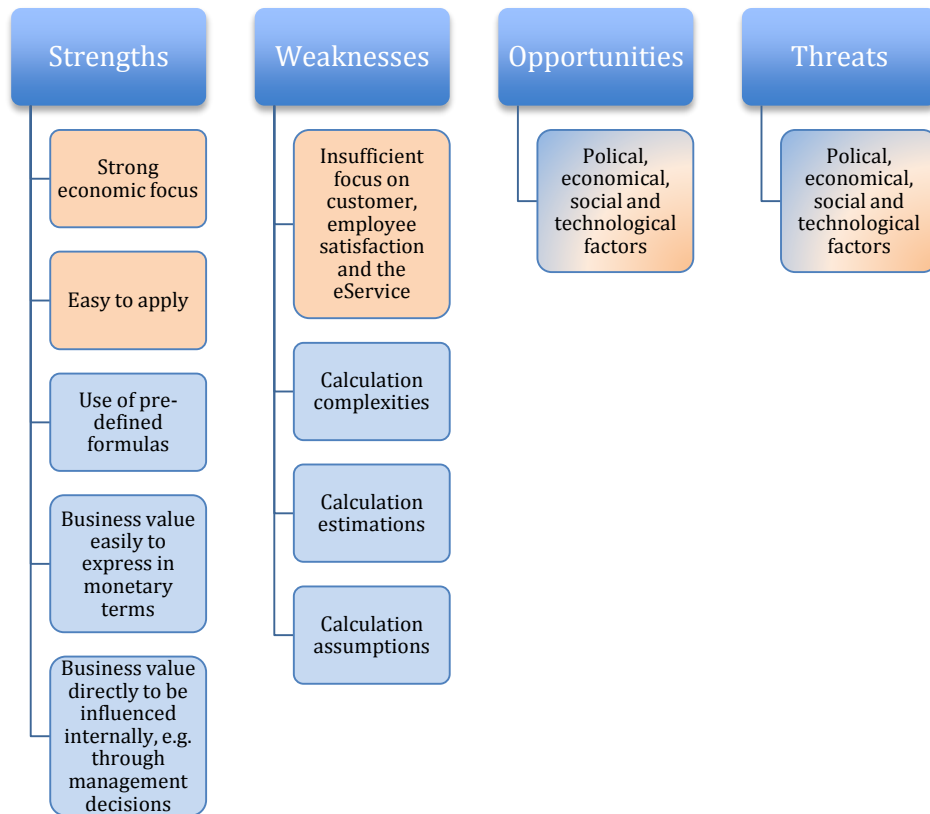
Source: Own representation with reference to Cook 2008 p. 32, Holler 2009 p. 17-18, Sammer 2012, Tambe 2014b, Townsend et al. 2007

4.3.4. SWOT-analysis for the assessment of economic indicators

The assessment of economic indicators has several strengths for the provider not to be found in other parts of the business value assessment framework. At first, metrics and models in this field have an economic focus, which makes this assessment part essential from the shareholder point of view (Holler 2009, p. 17-18). Furthermore, most of the metrics and models are easy to apply, as pre-defined formulas can be used. This helps to prevent mistakes in the calculation and leads to a high validity of the results. Economic metrics and models are, besides of this, easily to express in monetary terms (Tambe 2014b). This means that there is no need to develop own scales and evaluation units that have to be in turn monetized. Variables such as sales or costs needed for the maximization of the business value can be mainly directly influenced internally. Management decisions play an essential role when maximizing the economic indicators (Holler 2009, p.17).

Insufficient focus is put on customer and employee satisfaction as well as the eService functionalities. What is more, overcoming complexities of several calculations is the weakness of economic indicators. Furthermore, some of them work with estimations that are hardly to make in order to correspond to the future real situation. Other metrics and models work with assumptions that are only partly applicable on real cases.

Figure 16: SWOT-analysis for the assessment of economic indicators



Source: Own representation with reference to Holler 2009 p. 17-18, Tambe 2014b

Numerous external political, economical, social and technological factors are able to influence the company performance and thus also the economic indicators in general together with their validity. In other words all four factors have an external impact on business value either in a positive or in a negative way. Moreover, it needs to be pointed out that these factors can be considered to be opportunities or threats by a company according to the current situation and the environment a company is operating in. To name some examples, amendments on financial markets could be associated with better or worse conditions for capital costs. Positive market changes, such as gaining a strong competitive advantage leads to a higher business value. On the other hand, competitors with strong competitive advantage will be the cause for lower business value of the concerned

company. Both economic recession and economic growth influence the business value directly. When knowing the exact background of the eService provider, a much broader SWOT-analysis focusing on the economic indicators can be developed. In the Figure 16 all SWOT-factors are illustrated.

4.3.5. Concluding remarks

As shown in the results of the four SWOT-analyses conducted, all parts of the business value assessment frameworks contain both positive and negative aspects that can have a direct impact on the business value assessment in general and on the calculation validity. It follows from the analyses that there is not recommended to focus solely on one part of the assessment framework while underestimating other parts. To exemplify focusing solely on the features and functions, customer or employee satisfaction does not show whether the company is profitable. But, the business value in terms of profits is one of the main interests of the involved shareholders. On the contrary focusing solely on the economic indicators, would be very negative for the satisfaction of the own customers and employees, which is crucial for eServices in order to maintain a competitive advantage. So business value assessment is a very complex task and its assessment should be conducted from more perspectives to have a compact view on it and reach a realistic output. The ultimate goal lies in identifying the business value from all possible perspectives. In order to be successful the eService needs to be examined in terms of its features and functions, profitability while reaching a satisfied customers and employee base.

5. Research questions, summary, limitations and further research

The last part of this master thesis answers the research questions defined when developing the problem setting, aim and approach. Moreover, a summary together with the final results is given. Finally, limitations of this thesis as well as further research requirements are presented.

This master thesis is able to answer all of the defined research questions presented in Section 1.3. First of all the metrics and models suitable for eService business value assessment can be divided into four main categories, which include features and functions, customer satisfaction, employee satisfaction and economic indicators. All metrics and models belonging to these four categories were presented in detail in Section 3.2., where it was also shown that there are numerous aspects of eService business value to be taken into account. Also it is necessary to state at this point that the four categories belong to an own developed framework that needs to be followed in order to obtain a significant result. During the research many scientific articles that focus on the business value assessment in general as well as for eServices have been studied. Four of them are presented in Section 3.5. as the most relevant frameworks already developed in this field. Efforts were made to implement parts of these scientific findings also in the developed eService business value assessment framework. Section 2 presented general differences together with differences when it comes to the business value calculation of physical products, traditional services and eServices. As it was shown, due to special eService characteristics there are major differences between them. What is more, business value assessment tools for the evaluation of physical products or traditional services cannot be equally adopted for eServices. The reason is that while selling physical products strongly relies on exchanging goods for money, it is common to connect the business value with productivity. As a consequence more output on physical products equals to a higher business value. On a contrary business value of traditional services is often based on three factors, which include performance, company and customer. However, the evaluation of eServices is much more complex and is made up of a mix of essential business value driver factors, such as eService features and functions, economic indicators, customer and employee satisfaction. Due to the mentioned complexities, it is not possible to deliver a solid framework applicable for all kinds of eServices in general. The developed framework in this master thesis is an assessment proposal that can be applied under several

circumstances. The basis of a successful business value assessment includes an extensive knowledge about the own eService together with the business environment. It is the task of the eService provider to make a decision about the metrics and models to be used within the four parts of the assessment framework. But, as it was shown, dealing with all framework parts with the same importance is of a greater benefit than underestimating some crucial business value drivers. For this reason also the most valid business value result is achieved when all framework parts are broadly examined. The eService should be designed in an innovative, new, convenient and functional way, while focusing also on its profitability or desired performance according to its purpose. Next to this, customers and employees need to be addressed according to their satisfaction, as only in such a way the eService is going to operate according to the targets and be successful in a long run.

To sum up this master thesis presents a general framework of metrics and models eService providers can use when assessing the business value of the own company. The discussed metrics and models are part of the main framework elements: eService features and functions, customer satisfaction, employee satisfaction and economic indicators. Nevertheless, it is essential to adapt the business value assessment according to this framework to the own business case. Therefore, different eService providers might find also different metrics and models to be suitable for the business value assessment. However, on the basis of the conducted SWOT-analysis it is not recommended to focus only on one or some of the four framework categories. The most valid result is obtained when assessing all of the categories, as only in such a way a complex overview about the business value drivers can be reached, which in turn helps to calculate the business value in a correct manner.

As this master thesis develops a business value assessment framework in general, there is the potential to study it further and apply it on specific eService kinds. Thus, during such an application the metrics and models in each of the four framework categories need to be properly chosen for that particular eService. To underline the suitability of the developed framework, also the business value of various eService alternatives should be compared. Furthermore, empirical research needs to concentrate on the business value contribution significance of the presented metrics and models with respect to different eServices. The same approach should be applied also to the four business value assessment elements: eService features and functions, customer, employee satisfaction and economic indicators.

The goal of such a research would be to identify the element with the highest positive impact on the business value increase. As it was shown, more scientific focus is also needed in the field of measuring employee satisfaction. Currently, there exist not enough scientific evidence in this area, although the employee empathy is a very important element of a business value generation.

Abstracts

Abstract (English)

Key words: eService value, business value, business value assessment, key performance indicators, eService features and functions, customer satisfaction, employee satisfaction, economic value, business value metrics, business value models

Operating in the eService market is extremely challenging and requires an on-going development, adaptation and maintenance from the provider's point of view. To be successful with providing eServices on a long-term basis, they need to be managed correctly. This includes the assessment of the eService business value, whose calculation is also a good indicator for the eService performance and the achievement of company key performance indicators. The assessment of eServices business value is performed by using appropriate methods and metrics that are presented in this master thesis. They are structured into a business value assessment framework that was developed for this purpose while conducting an extensive research on existing scientific evidence. The development of the framework resulted in achieving four main areas of eService business value assessment, which include assessment of the eService features and functions, customer satisfaction, employee satisfaction and economic indicators. For every of these four elements suitable metrics and models are introduced. Furthermore, the SWOT-analysis is constructed for every part and examines the strengths, weaknesses, opportunities and threats with regard to the general aspects as well as result validity. The results show that focusing on a broad spectrum of factors driving the business value is absolutely crucial. Thus, the developed framework should be applied systematically in order not to underestimate important business value aspects.

Abstract (German)

Schlüsselwörter: eService-Wert, Unternehmenswert, Bewertung des Unternehmenswerts, Leistungskennzahlen, Eigenschaften und Funktionen von eServices, Kundenzufriedenheit, Mitarbeiterzufriedenheit, wirtschaftliche Kennzahlen, Metriken des Unternehmenswerts, Modelle des Unternehmenswerts

Es gehört zu einer extrem anspruchsvollen Aufgabe, auf dem Markt für eServices zu agieren, da der Anbieter eine konstante Entwicklung, Anpassung und Pflege von eServices gewährleisten muss. Ein korrekt funktionierendes Management ist erforderlich, um beim Angebot von eServices langfristig Erfolge zu erzielen. Eine dieser Managementaufgaben inkludiert auch die Bewertung des Unternehmenswerts, dessen Berechnung zugleich als ein guter Indikator der eService-Leistung sowie der Erreichung der Leistungskennzahlen dient. Die Bewertung des Unternehmenswerts wird mittels der Anwendung von geeigneten Metriken und Modellen durchgeführt, die in dieser Masterarbeit ausführlich beschrieben sind. Durch eine umfassende Literaturrecherche war es möglich, diese in ein im Rahmen dieser Ausarbeitung entwickeltes Konzept zu integrieren. Es gibt vier Hauptbereiche dieses Konzeptes und zwar die Bewertung der Eigenschaften und Funktionen von eServices, Kundenzufriedenheit, Mitarbeiterzufriedenheit und zuletzt von wirtschaftlichen Kennzahlen. Für jeden Bereich gibt es geeignete Metriken und Modelle, die vorgestellt sind. Dazu wird für jeden Bereich eine SWOT-Analyse durchgeführt, welche die Stärken, Schwächen, Möglichkeiten und Risiken im Hinblick auf deren generelle Aspekte sowie Ergebnisgültigkeit näher analysiert. Die Ergebnisse zeigen, dass der Fokus auf ein breites Spektrum an Faktoren, die den Unternehmenswert erhöhen, für den Anbieter absolut grundlegend ist. Aus diesem Grund ist es empfehlenswert, das gesamte entwickelte Konzept systematisch anzuwenden, um keine wichtigen Unternehmenswertaspekte zu unterschätzen.

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Bachelor Economics and Social Studies, Focus: Export Management, Transport and Logistics Management

04.09.2002–05.06.2007: **Commercial Academy, Bundeshandelsakademie & Bundeshandelsschule**, Pernerstorfergasse 77, 1100 Vienna, Austria

Focus: International Business and Cross Cultural Studies

PERSONAL SKILLS AND COMPETENCES

Mother tongue Slovak

Other languages

German: perfect knowledge

English: very good knowledge

Russian: good knowledge

Spanish: basic knowledge

Technical skills and competences MS Office 2010, Windows, Mac OS X, Citrix, Typo 3, SAP Business Communications Management CDT, Customer Interaction Center, Oracle Right Now Cloud Service, OTRS