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Master's Thesis

Customer Profitability Analysis in Telecommunications Industry

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ABSTRACT

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Keywords: Activity-Based Costing; Activity-Based Management; Customer Accounting; Customer Lifetime Value; Customer Profitability; Customer Profitability Analysis; Cost Management; Telecommunications.

The goal of this study is to research how B2B customer profitability could be measured at a customer level in a telecommunications company and to explore the possibilities and challenges related to it in practice. Also, the aim is to clarify the concept of customer profitability analysis. The starting point of this study is the desire of the management of the case company to get a new point of view to the topic. The study is based on the present state of the case company and the academic literature. Research methods are qualitative case study and action research, which is based on observation and conversations in the case company. Used quantitative data is received from the IT systems of the case company.

As an outcome of this study, the concept of customer profitability analysis is clarified. It is found a potential approach in the measurement and management of customer profitability at a customer level in the case company. It is not an all-embracing solution to the challenge of the customer profitability measurement and management. Its implementation would be a ponderous task but would give a new managerial dimension, and hence could give a competitive edge over the competitors. This study gives a premise for possible future changes in the case company. The outcomes can be utilized in other companies as well.

TIIVISTELMÄ

Tekijä: Teemu Väliahdet

Työn nimi: Asiakaskannattavuusanalyysi televiestintä-toimialalla

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Avainsanat: Toimintolaskenta; Toimintojohtaminen; Asiakaskannattavuus; Asiakaskannattavuusanalyysi; Asiakkaan elinkaariarvo; Kustannusjohtaminen; Televiestintä.

Diplomityön tarkoituksena on tutkia, kuinka yritysasiakkaiden asiakaskannattavuutta voitaisiin mitata asiakastasolla televiestintätoimialalla toimivassa yrityksessä sekä tarkastella siihen liittyviä mahdollisuuksia ja haasteita käytännössä. Tavoitteena on myös selventää asiakaskannattavuus-analyysiä käsitteenä. Lähtökohtana asiakaskannattavuuden mittaamisen tutkimiseen on yrityksen johdon halu saada aiheeseen uusi näkökulma. Tutkimus perustuu yrityksen nykytilaan ja akateemiseen kirjallisuuteen. Tutkimusmenetelmät ovat laadullinen tapaustutkimus ja toimintatutkimus, joka perustuu havainnointiin ja avoimiin keskusteluihin case-yrityksessä. Työssä hyödynnetty määrällinen aineisto on saatu yrityksen tietojärjestelmistä.

Työn tuloksena on selvennetty asiakaskannattavuusanalyysin käsitettä ja todettu se potentiaaliseksi lähestymistavaksi asiakaskannattavuuden mittaamiseen ja hallintaan case-yrityksessä ja toimialalla sekä käsitelty sen mahdollisuuksia ja haasteita. Asiakaskannattavuusanalyysi ei ole kaiken kattava ratkaisu asiakaskannattavuuden mittaamisen ja hallinnan ongelmaan. Sen suunnittelu ja käyttöönotto on raskas tehtävä, mutta se toisi uuden ulottuvuuden johtamiseen ja voisi siten antaa kilpailuetua. Työ antaa lähtökohdan mahdollisille tuleville muutoksille case-yrityksessä. Tuloksia voi hyödyntää myös muissa yrityksissä.

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Teemu Väliahdet

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ABBREVIATIONS

ABC	Activity-Based Costing
ABM	Activity-Based Management
B2B	Business-to-Business
B2C	Business-to-Customer
CE	Customer Equity
CLV	Customer Lifetime Value
CP	Customer Profitability
CPA	Customer Profitability Analysis
CPM	Customer Profitability Management
EBIT	Earnings Before Interest and Taxes
FC	Fixed Costs
GL	General Ledger
MA	Management Accounting
NPV	Net Present Value
TC	Total Costs
VC	Variable Costs

1 INTRODUCTION

1.1 Background

The topic of customer profitability has emerged in the academic literature and companies in recent decades along the shift from product focused mindset to customer. The idea that customer is the ultimate origin of the company's profit is now widely accepted. (Cokins 2015; Holm et al. 2016; IMA 2010; McManus 2007; Pfeifer 2005) Consequently, measurement and management of customer profitability is the key to improve the profitability on a company level, because increasing customer profitability increases company level profitability (IMA 2010).

The development of managerial accounting systems, information technology and especially adaptation the principles of activity-based costing (ABC) since late 1980's have made possible to measure profitability of customers at a customer segment level and a customer level (Cooper & Kaplan 1988; IMA 2010; Kaplan & Narayanan 2001). Measurement of customer profitability gives the view on which customers generate the profits of the company and which ones erode it. When recognizing and acknowledging that, companies have the possibility to target correct actions to individual customers in order to improve their profitability (Cokins 2015).

Telecom industry has faced the change in operational environment in recent decades due to the changed customer demand, technological development and liberalization of EU telecom sector in the late 1990's (EU 2018). Prior to liberalization, companies operated in monopoly positions for the public telecom services and detailed management accounting was not seen as a necessity. They were also criticized for inefficient spending of public resources. (Major 2013, 2014)

Overall, tightening competition led to decreasing prices, thus forcing telecommunication companies to increase their performance and develop their managerial accounting systems. More accurate and detailed cost accounting data was demanded by regulators as well. Activity-based costing was found to be the

solution for the demand at that time in telecom sector as in many other industries before. (Cokins 2015; Major 2013, 2014)

The subject of this thesis was given by a large telecommunications company operating in Finland. They wanted to know how business-to-business customer profitability could be measured in the field of telecommunications industry. Also, they wanted a suggestion of how it could be approached considering their business in B2B context.

The topic emerged from the assumption of managers in case company that their current measurement of profitability was not accurate when considering the profitability of individual B2B customers. According to scarce research discovered during this thesis (Major 2014; McManus 2007), the management accounting has been product-focused in telecommunications industry overall as well as in the case company.

The case company operates mainly in Finland and in other Nordic countries and Baltics. Its history dates back to 19th century, though in very different form than it is today. The company has evolved to the present day through mergers, company acquisitions and adaptation to technological change. Of course, through the history it has faced the same challenges as telecommunications industry as a whole.

1.2 Objectives and Delimitations

The objective of this study is to research how business-to-business customer profitability could be measured at a customer level based on academic literature and the present state of the case company. Also, goal is to get the idea of how topic is covered in prior academic research conducted in telecommunications industry and to clarify the concept of customer profitability with conceptual framework of customer profitability analysis, which could be implemented in the case company. Research questions are as follows:

"How B2B customer level profitability measurement could be approached in the case company and in telecommunications industry?"

"What are the possibilities and challenges related to customer profitability analysis in the case company?"

Thesis is delimited only to B2B segment, which was proposed by the case company. During the first phases of the work, review of the key literature and the analysis of the present state of the case company, it became evident that the first approach to measurement of B2B customer profitability should be done with principles of activity-based costing. According to Horngren et al. (2012), ABC is applicable costing system in Customer Profitability Analysis. Focus is in the description of possibilities and challenges related to customer profitability measurement in the case company.

1.3 Research Design and Methods

The research design of this study is qualitative case study, where "a real life, contemporary system (a case)" is examined over time (Creswell 2013) and formed an understandable story, which could be implemented in the reader's own situation (Stake 1995). The study is based on the academic management accounting literature and the present state of the case company. The case study method is applied in this research due to it supports the goal of this thesis to solve the real managerial problem in the case company, but the results can be applied in other companies and situations as well.

The empirical information is gathered via open conversations with specialists of the case company and observation while participating in organization's daily operations. Therefore, the other research method used here is action research, where the researcher participates in operations of the company and so influencing to the company. The foundation of action research is the integration of theory and practice. (Jyväskylän Yliopisto 2015) Quantitative numerical data is gathered from current management accounting systems, and to get a view to customer level, customer specific pricing data is provided by pricing manager.

The work began in November 2017 by clarifying the concept of customer profitability and discovering different customer-based approaches to profitability in the academic literature. The next step was to explore the present state of the profitability calculations in the case company and to figure out which theoretical approaches introduced in the academic literature could work in the case company and in the telecommunications industry. Then the generic approach to new profitability measurement system was investigated in the light of the case company. The last phase of this project was to investigate how this approach to profitability measurement could provide new information of profitability at a customer level. The project came to an end in April 2018.

1.4 Structure of the Thesis

The structure of this thesis is the following. After this introduction part the literature related to customer profitability is reviewed and discussed how the customer level profitability could be approached. Then the academic literature of customer profitability analysis and activity-based costing system related to it are reviewed. From the literature review emerged two key sources from the telecommunications industry to support the study part of this thesis giving the guidance on how customer profitability analysis and activity-based costing could be applied in the case company. They give a glimpse of a real-life experiment of customer profitability analysis and of a successful activity-based costing implementation in the telecommunications industry. They are examined in the end of the literature review part.

The study part follows the literature review. First the present state of the case company's costing system is introduced. Then the customer profitability analysis in the case company is examined: how it could work and what are the possibilities and challenges related to it in the case company. After that, four customer cases are presented and described the possible form of customer profitability report. In the end of the thesis conclusions and future research are discussed and the summary presented. The structure is illustrated in the Figure 1.

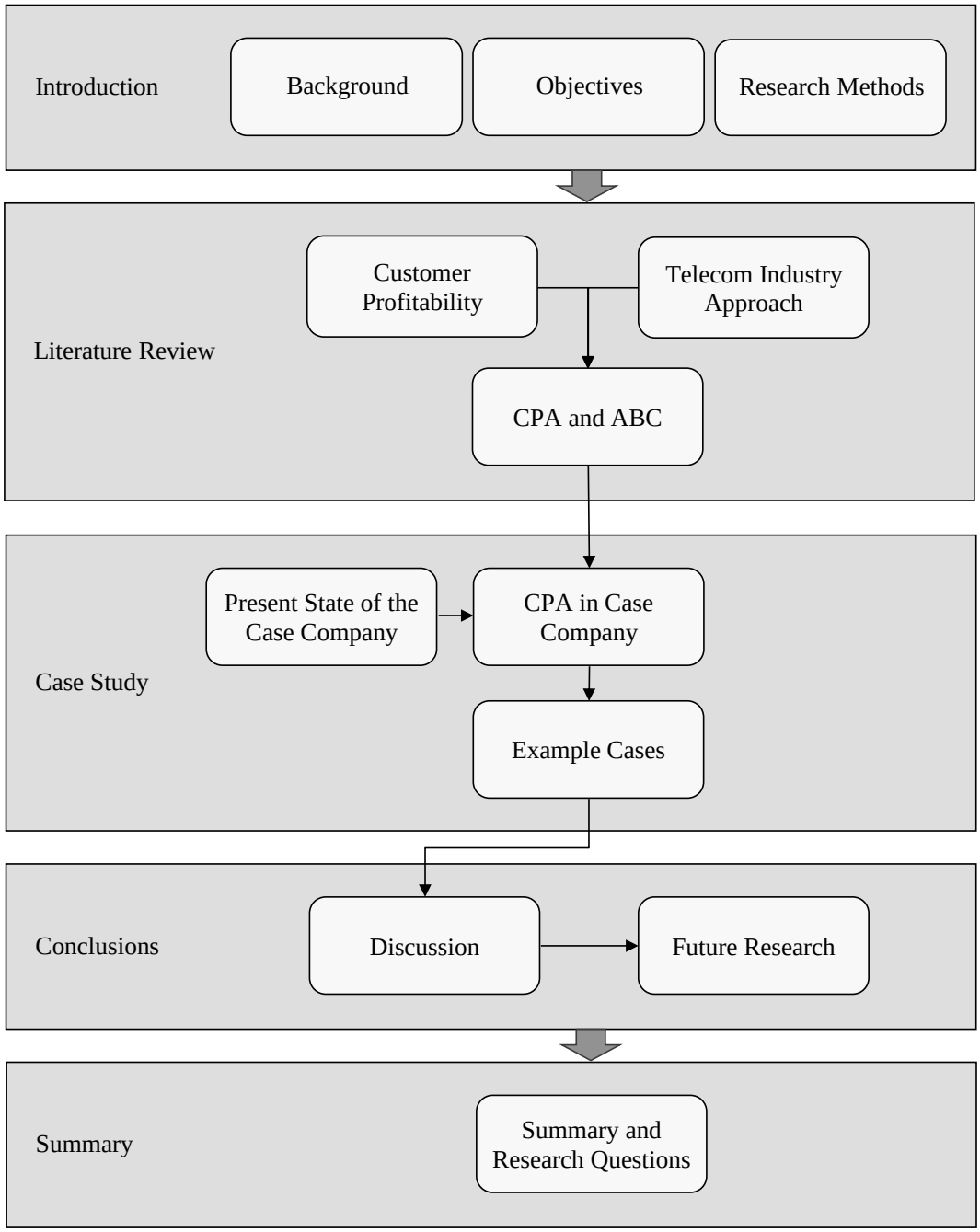

Figure 1. Structure of the Thesis

2 LITERATURE REVIEW OF CUSTOMER PROFITABILITY

2.1 Customer-Based Approaches to Profitability

In the literature, the concept of customer profitability is referred to at least as customer profitability, customer profitability analysis, customer lifetime value, customer life value, customer relationship value, customer equity and customer accounting (e.g. Chang et al. 2014; Epstein 2007; Gleaves et al. 2008; Holm et al. 2012; Holm et al. 2016; Jain & Singh 2002; Pfeifer et al. 2005; IMA 2010). However, there can be found two main concepts considering profitability of a customer: Customer Profitability (CP) and Customer Lifetime Value (CLV) (Chang et al. 2014; Gleaves et al. 2008; Holm et al. 2012; Jain & Singh 2002; Pfeifer et al. 2005).

It is not obvious that CP and CLV is understood as discrete terms, and they are used frequently interchangeably (Chang et al. 2014; Epstein 2007; Gleaves et al. 2008; Jain & Singh 2002; Pfeifer et al. 2005; IMA 2010). Even though they have a common objective to identify the most valuable customer, according to Holm et al. (2012) and Gleaves et al (2008), they have been studied remarkably independently between the marketing and management accounting (MA) literatures. Regardless, there can be found much in common between the definitions and the characteristics of each definition can be recognized.

Pfeifer et al. (2005) have defined profitability as "the arithmetic difference between earned revenues and associated costs – where revenues and costs are measured on an accrual basis, not a cash basis" for a given time period (e.g. one year or month accounting period). Cokins (2015) sympathizes and defines profit as net revenues less the costs. Therefore, that definition of profitability should be matched to the concept of CP at customer level.

Based on the definition of profitability, Pfeifer et al. (2005) define Customer Profitability as "the difference between revenues earned from and the cost associated with the customer relationship during a specific period". CP could be seen as a retrospective approach, because CP (as the concept defined in this study) is based on the revenues and the costs occurred in the past (Epstein et al. 2008; Holm et al. 2012).

Value could be roughly understood as "what something is worth today" taking into account future cash-flows discounted to the present time (Pfeifer et al. 2005). Thereby, Customer Lifetime Value is related to concept of net present value (NPV) and takes into account the time value of money by discounting the sum of future cash flows to today (Gupta et al. 2006; Holm et al. 2012; Pfeifer et al. 2005). In CLV approach customers can be seen as assets and acquiring the customer as an investment (Epstein et al. 2008; Gupta & Lehmann 2003).

Here, like Chang et al. (2014) incisively interpreted, the customer's value and profitability are seen from the company's point of view, in other words, what is the customers' value to the company. The value created to the customer is not examined, though, it is highly important perspective as well.

As stated before, the important difference between CP and CLV is that the former is usually based on period operating profit and the latter is based on future cash flows. However, CLV could be seen also as the discounted measure of future profits (Pfeifer et al. 2005), and that way the greatest difference between those concepts is the timescale examined. Gleaves et al. (2008) have introduced the inter-relation of the main concepts of profitability given in the literature and enlighten the relation between them (Figure 2).

All customers	Period Operating Profit	Customer Equity
A single customer	Customer Profitability	Customer Lifetime Value
	Current accounting period, e.g. one year	All future accounting periods (NPV basis)

Figure 2. Inter-relation matrix (Gleaves et al. 2008)

In the matrix above is presented four concepts of profitability – CP, CLV, Customer Equity (CE) and total annual operating profit – and their relation in two by two matrix. Horizontal dimensions are "all customers" and "a single customer", and vertical are "one accounting period" and "all future accounting periods" discounted to present time. (Gleaves et al. 2008)

Period operating profit is seen here as the sum of profit generated by every customer of the company. In other words, CP is the revenues and costs traced from company level to single customers by some method. Relation between CP and CLV is that both illustrates profitability of one single customer, but the time span is different. With some adjustments, CP could be seen as the special case of CLV, yet the timespan being one accounting period (Gleaves et al. 2008).

Customer Equity is defined as "the sum of all current and future customers' lifetime values" (Gleaves et al. 2008). Using that definition, CLV and CE can be linked together. If seeing customers as assets, combined CLVs is the value of the customer base and is that way linked to the value of the company (Bauer & Hammerschmidt 2005; Gupta & Lehmann 2003).

Why customer-based approach to profitability is important? Managers tend to appreciate that revenues are derived from customers and the profitability in company level is usually monitored closely (Gleaves et al. 2008). Customers are

also directly the source of many costs. To improve their ability to make profit, companies should focus on the origin of the profit. The origin of the company's profit and shareholder value is ultimately the customer (Cokins 2015; IMA 2010; Pfeifer 2005). Consequently, the measurement and management of customer profitability is the key to improve company's profitability (IMA 2010).

2.2 Customer Profitability Analysis

Some customers contribute to the profit of the company more than the others. Therefore, it is important to see the difference between high-profit and low-profit customers or even negative-profit customers to react appropriately improving profitability of the company. It may come as a surprise, but high revenue but demanding customers may be actually unprofitable due to high cost to serve and given discounts for instance. Actually, it seems that only large customers can create significant losses (Kaplan 1989). But that will just remain as an assumption if companies are not able to measure profitability at a customer level. (CIMA 2000; Cokins 2015; IMA 2010; Pfeifer et al. 2005; Raaij et al. 2003) According to Kaplan and Narayanan (2001) the profitability of customers is even more essential than the profitability of products.

In the MA literature, Customer Profitability Analysis (CPA) is mostly referred to as measurement of profitability of individual customers or customer segments with some sort of costing system and using that information in broader strategic decision making in the company considering customers. CPA is based on the CP described in the prior chapter, but could be seen as a broader managerial approach, whilst CP only as a customer profitability measurement technique. (CIMA 2000; Cokins 2015; Gleaves et al. 2008; IMA 2010; Raaij et al. 2003; Raaj 2005). Usually potential of CLV has been mentioned but not examined more closely (e.g. CIMA 2000; Cokins 2015; IMA 2010). However, in the marketing literature the CLV-like profitability approaches have been studied more (Chang et al. 2012; Epstein et al. 2008; Gleaves et al. 2008; Holm et al. 2016).

In the marketing literature, the concept of profitability analysis is approached often with some kind of CLV approach (Chang et al. 2012; Epstein 2008; Gleaves et al. 2008; Holm et al. 2016). As stated before, CLV kind of approach measures or estimates the future profit potential of a customer or a customer segment. Also, marketing scholars have argued that both CP and CLV should be implemented and used when measuring and analyzing customers' profitability (Epstein et al 2008; Holm et al. 2012, Holm et al. 2016). However, according to Raaij et al. (2003) and Epstein et al. (2008), prior to estimating the future costs and revenues, it might be essential first step to conduct a retrospective analysis of customer profitability. Despite the potential of CLV approach, the retrospective approach of CPA is also well suited for decision support (Holm et al. 2012).

Traditionally management accounting in companies has focused on the product related revenues and costs – not in customer profitability and consequently its strategic use in decision making. However, CPA (also referred to as Customer Profitability Management and Customer Accounting) grows in importance among companies along with MA literature. (Cardos & Cardos 2014; CIMA 2000; Cokins 2015; Holm et al. 2012; Holm et al. 2016; IMA 2010; van Raaij et al. 2003; van Raaj 2005) Cokins (2013) considers it as one of the biggest trends in MA.

CPA Framework

In the literature, there are different approaches to CPA as stated above. There are different implementation frameworks as well (e.g. IMA 2010; van Raaij et al. 2003), but a clear framework for using CPA on an ongoing basis is not presented even though CPA has been described thoroughly (e.g. CIMA 2000; CIMA 2009; Cokins 2015; Holm et al. 2016; IMA 2010; van Raaij et al. 2003; van Raaij 2005). In the Figure 3 is combined the recognized characteristics of CPA and formed a CPA framework to clarify the concept of CPA.

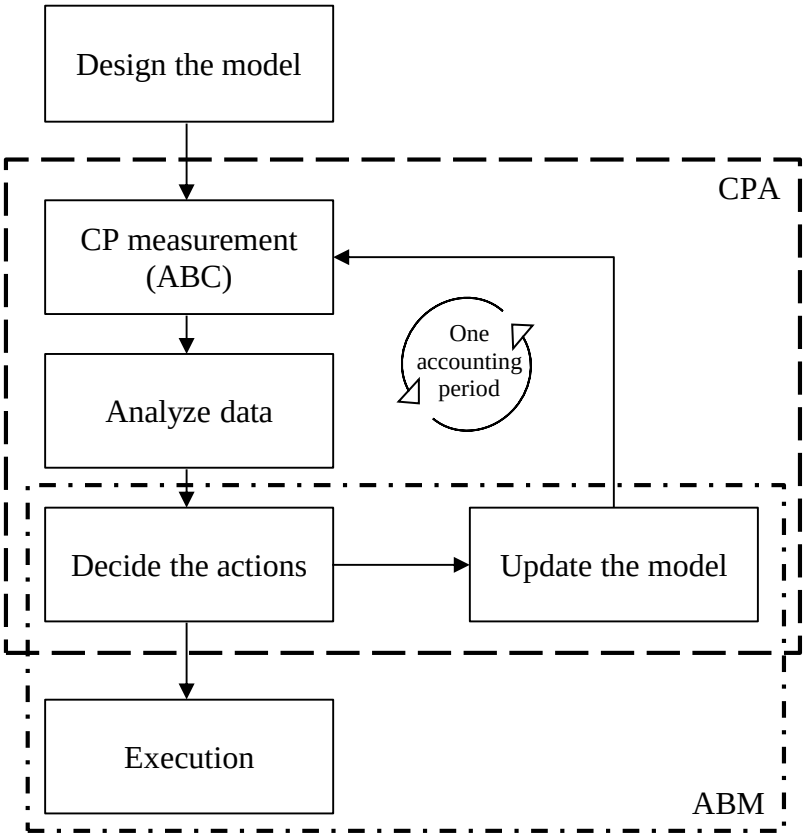

Figure 3. CPA-framework (CIMA 2000, 2009; Cokins 2015; IMA 2010; van Raaij et al. 2003)

In the core of CPA and its most crucial part is the costing system (Cokins 2015; IMA 2010). That is due to being able to make justifiable decisions and actions, the analysis must be made correctly, and to be able to make analysis correctly the customer-centric costing data must be based on costing's causality principle (Cokins 2015; IMA 2010). Most of the scholars argues that activity-based costing (ABC) is an appropriate costing system for CPA purposes, however, other costing systems can be used as well (Bates & Whittington 2009; Cardos & Cardos 2014; Cokins 2015; Guerreiro et al. 2008; IMA 2010; Raaij 2005; Raaij et al. 2003). Since profitability was defined as revenues less the costs, and given that revenues related to customers are rather straightforward to assign compared to costs, an accurate customer-centric costing system is required and must be designed before using CPA. (Cokins 2015; IMA 2010) More about the costing system is in the next chapter.

After designing the costing system, the calculation of customers' profitability can be conducted. Then the data is analyzed and based on that the actions are decided. If using the CPA on an ongoing basis, the costing system must be updated: usually just adjustments to the drivers or their quantities or making larger changes in the model itself. The cycle starts over in the beginning of the next accounting period.

Because CPA is usually based on cost data generated by ABC, the actions decided and made in CPA relates to the generally used concept of Activity-Based Management (ABM) as well as updating the model. IMA (2010) states that "ABM is not directly an integral part" of CPA (they use term "customer profitability management", CPM), because generally CPA can be based on other costing systems as well. Gokins (2014) partly emphasizes but implies that "the use of ABC data leads to ABM – taking actions based on the ABC data". In this thesis, ABM is seen as an integral part of CPA.

To conclude, the actual value of customer profitability calculation and analysis, is that the companies are able to make better decisions. (Cokins 2015; van Raaij et al. 2003) The calculation of customers' profitability is not value itself, because the system itself does not tell what to do but rather where to look and ask the right questions (Cokins 2014; IMA 2010, 2014). It is not straight forward to decide the actions based on CPA data as discussed later.

One good way to examine the CPA data is to sort customers based on profitability from the most to the least profitable (or unprofitable). Then they are plotted cumulatively on a graph where on the x-axis is the number of customers and on the y-axis is the cumulative profitability in monetary units and on the secondary y-axis is the percent of cumulative profits (Figure 4). The curve is called generally "whale curve", "profit cliff chart" or "Stobachoff curve". (Cokins 2015; IMA 2010; Kaplan 1989; van Raaij et al. 2003)

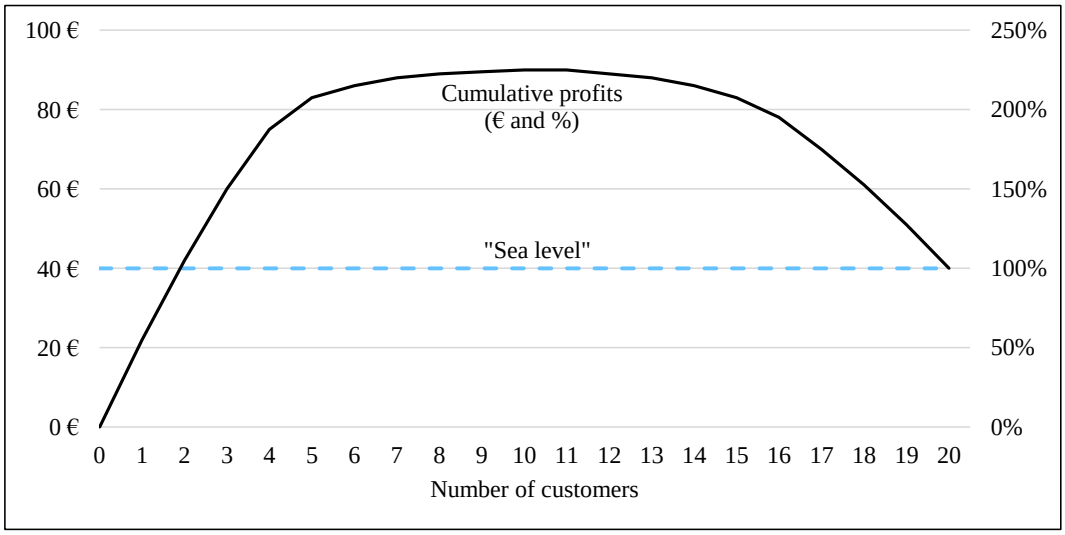

Figure 4. CP whale curve (adapted from IMA 2010)

Whale curve represents how customers contribute to profits or destroy the potential profit. In the beginning of the curve, there are customers who are profitable and contribute the most profits of the firm. In the middle are “break even” customers and the remaining are unprofitable and they return profit to “sea level” to 100 % (IMA 2010; Kaplan & Narayanan 2001), which is comparable to company’s profit and loss statement’s profit if all costs are traced to customers using ABC and causal cost assignment (Cokins 2015). In the Figure 5 is presented the same data in the column chart and in the Figure 6 in deciles (Cokins 2014, 2015; IMA 2010).

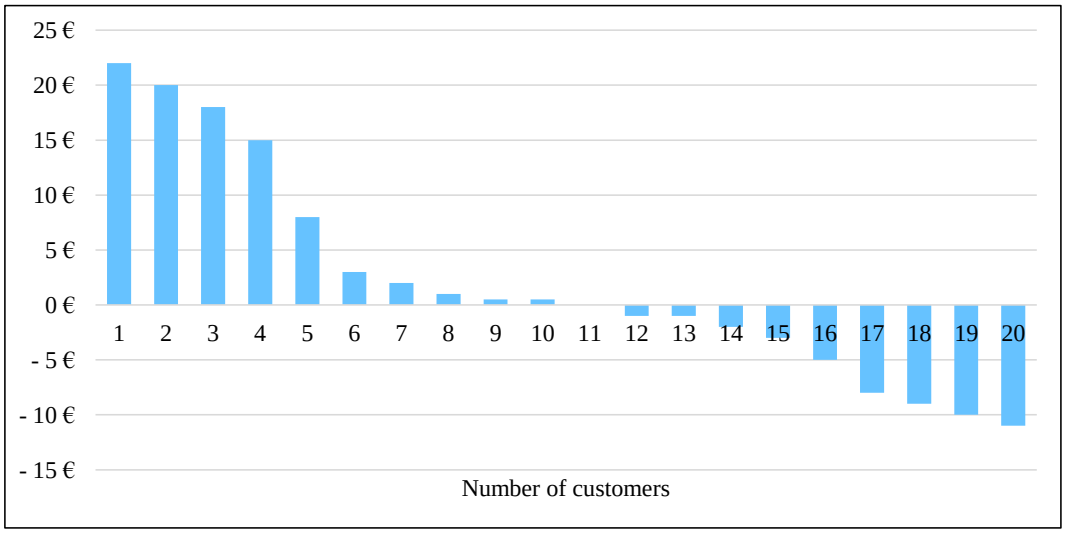

Figure 5. Customers ranked from most to least profitable (IMA 2010)

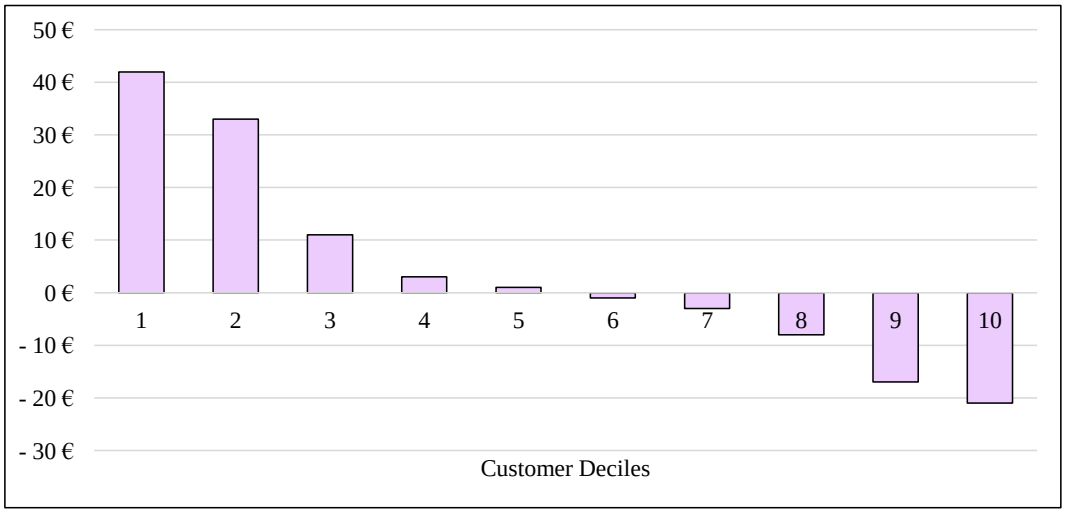

Figure 6. Decile contribution analysis (Cokins 2014)

After measurement of customer profitability and the whale curve outlined, company knows who their profitable and unprofitable customers are – but not why. That is the main thing to consider before doing rash decisions and actions. (IMA 2010) The weak profitability may be the result of unprofitable products or services, but it may well be due to high cost to serve compared to current cost structure and revenues of the customer. The case may be the opposite as well: the customer's profitability may be so high, that in their retention and service could and should be invested more, because they are the most important customers from the company's profitability point of view (Cokins 2015; IMA 2010; van Raaij et al. 2003)

Customers who have the same kind of product mix (or service lines) and the same prices, may contribute to profits very differently as seen in the whale curve, even though they would generate exactly the same revenue (Cokins 2013; IMA 2010; van Raaij 2005). That is due to cost to serve caused by the sales and distribution channels and by customers' actions (Cokins 2013; IMA 2010). In the Figure 7 is illustrated that there are much more expenses than just the product related ones if focus is in customers. The important thing is that from this point of view costs of sales, service, marketing and distribution are not considered costs of products but costs of customers. (Cokins 2013)

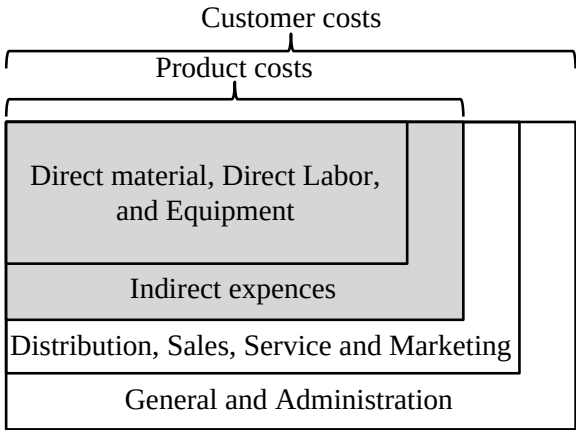

Figure 7. Product related costs and costs to serve (adapted from Cokins 2013)

In the Figure 8 is demonstrated the impact of cost to serve to customers' profitability for the customers who consume the same mix of products (or services), thus having the same amount of "costs of goods sold" (COGS). The Customer X is a regular customer in terms of sales and service costs – Customer X does not require a special treatment. The product (or service) profile of Customer Y is equal to Customer X but requires much sales and service efforts. That makes Customer Y unequal to Customer X in profitability-wise. (van Raaij 2005)

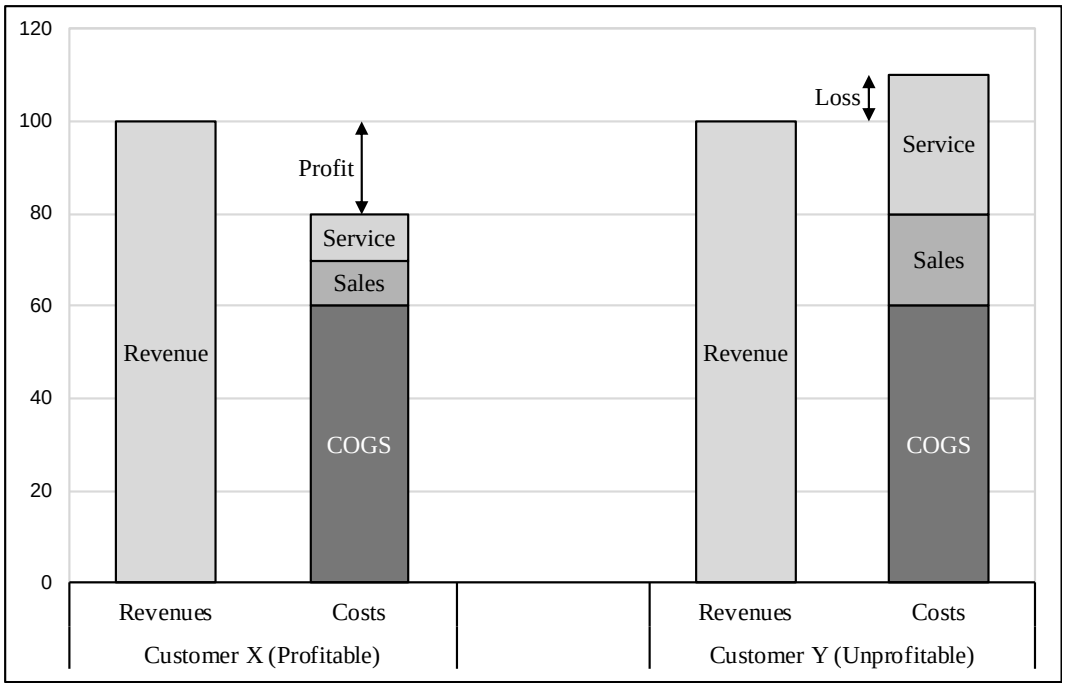

Figure 8. Cost to serve (adapted from van Raaij 2005)

Two notable aspects of company's profit margin are: (1) the purchased products (and services); (2) the costs to serve apart from the products and services purchased. Based on classification in question, conceptual two-axis grid can be formed, where the horizontal axis is cost to serve, and vertical axis is the customer's gross margin of products (or services) purchased. Customers can be plotted to the chart based on those dimensions as circles, which diameter illustrates the revenue of the customer. In the Figure 9 is presented the two-axis grid of profitability and, for example, placed there the Customers X and Y from above. (Cokins 2015)

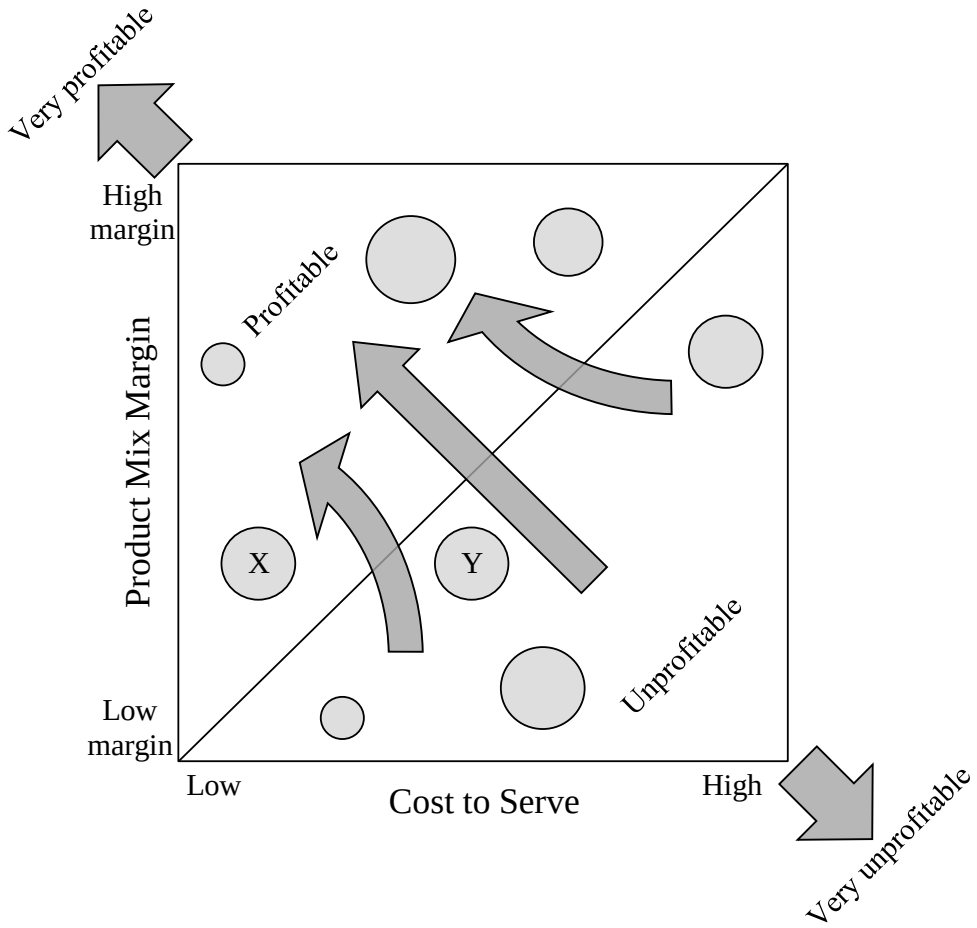

Figure 9. Two-axis grid of customer profitability (adapted from Cokins 2015)

The goal is to drive customers towards the upper left corner of the grid and that way towards better customer and corporate profitability. Also, identifying the customers in the upper left corner, which are the most important customers from the profitability point of view, makes focusing in their retention much easier. The whole idea of the figure above is to illustrate that the revenue itself does not tell

anything about customer's profitability, in other words, all sales are not profitable sales. Companies should be able to acquire more profitable sales, not just more sales in general. It is important to maintain the balance in the spending of resources in the service of customers and in their retention. (Cokins 2015)

2.3 Measurement of Customer Profitability

CPA needs rather accurate costing system in order to measure profitability adequately (Cokins 2015; IMA 2010). Most of the scholars suggest that application of Activity-Based Costing is appropriate costing system to utilize in CPA, because it traces overheads to customers by means of costing's causality principle and can reveal costs to serve customers (Bates & Whittington 2009; Cardos & Cardos 2014; Cokins 2015; Guerreiro et al. 2008; IMA 2010; Raaij 2005; Raaij et al. 2003). As a matter of fact, ABC provides a broad view to company's business and processes apart from just tracing costs to cost objects (Cokins 2001, pp. 1-2).

Also, traditional unit-based costing system could be used. However, it presumes that cost objects' (e.g. products and customers) consumption of indirect or shared costs are consistent. It is not valid assumption and results in misleading results, so that is the reason traditional costing system should not be applied in most cases of CPA. (IMA 2010)

Activity-based costing have been developed in the late 1980's to respond to changing cost structures of companies and to better illustrate the costs related to products, services and customers. Over the years the proportion of indirect and shared costs (e.g. marketing costs) have been increasing at the same time when direct costs (such as direct labor and materials) have been decreasing. That caused distortion of traditional cost information, because the considerable amount of costs did not occur along making commodities anymore. (Cokins & Capusneanu 2010; Cooper & Kaplan 1988; IMA 2014)

In ABC method, indirect and shared costs are traced to cost objects (e.g. products or services) based on their consumption of resources through activities in order to produce output. In the Figure 10 is presented the basic approach to ABC. Costs

from resources are traced to activities and from activities to cost objects using cost drivers. (CIMA 2008)

Figure 10. Generic Activity-Based Costing method (adapted from Wegmann 2009)

Resource is "an economic element" that is consumed by operation of activities. Resource costs are, for example, administration, marketing, and IT expenses. *Activity* can be seen as the work done within an organization which consumes resources (e.g. "performing maintenance" and "developing products"). If costs are assigned to same activity, they must be governed by same driver and same resource consumption intensity. *Cost object* is where costs are finally traced. Cost object can be individual customers, customer segments, products or something else for which separate cost data is desired (e.g. orders or projects). To conclude and simplify: resources are the capacity to perform work, activities are the work performed which consumes resources, and cost objects are for what or whom the work is performed. (CAM-I 2008; Cokins & Capusneanu 2010; IMA 2014).

Since cost objects consume activities and the activities consume resources, cost drivers could be seen as links between resources, activities and cost objects. From ABC point of view, cost drivers are units that causally traces indirect and shared resource costs associated with activities based on usage that cost objects demand. More generically, cost driver is any factor that changes the cost level of an activity or the amount of the activity's cost consumed. (Cokins & Capusneanu 2010)

According to Cokins and Capusneanu (2010) there are three main levels of cost allocations and drivers: (1) Resources to activities – Resource drivers; (2) Activities to cost objects – Activity drivers; (3) Cost objects to final cost objects – Cost object drivers (Figure 11). Resource driver is "a measure of quantity of resources consumed by an activity" and activity driver is "a measure of the frequency and intensity of the demands places on activities by cost objects" (CAM-I). Cost objects

may consume different combinations of other cost objects (e.g. customers consume different set of products). As an example: product can be *cost object* and customer *final cost object*.

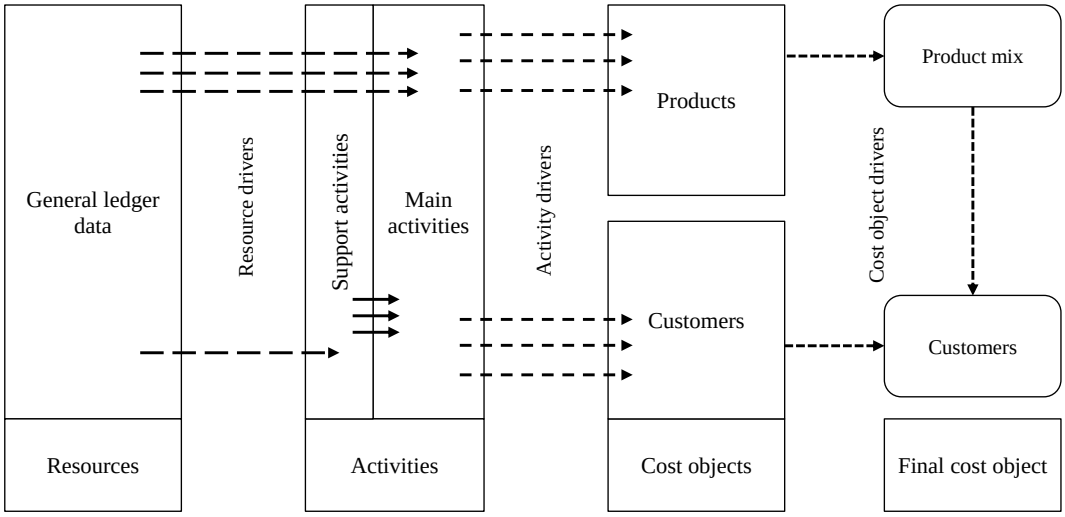

Figure 11. Cost drivers illustrated within context of ABC (Cokins & Capusneanu 2010)

There can be main activities and support activities. Support activities are considered as "resources" to serve main activities. (Cokins & Capusneanu 2010) In other words, they are supporting other activities and they are not consumed directly by cost objects. As an example of support activity from manufacturing company: maintenance activity, which maintains machine manufacturing products, but it is not consumed directly by products the machine is manufacturing. Cost drivers of support activities to main activities are called inter-mediate drivers. (IMA 2014)

Three types of cost drivers can be recognized. First type is transactional drivers, which assign costs based on number of transactions (counts), for example the number of customer visits conducted by a salesperson. Second driver type is based on duration (time). It assigns costs based on time consumed, for example the time spent during customer visit by salesperson. Third one is based on intensity or actual consumption of resources – direct tracing. In some cases activities performed are complex that other driver types are not precise enough, for example if there is much variation on how many sales persons attend the customer visits and on the other

expenses (e.g. traveling). In that case the costs should be calculated case by case. (IMA 2010; van Raaij et al. 2003)

If examining cost drivers from CPA point of view, the selection of drivers is crucial in terms of correct analysis and actions made based on ABC data. For instance, if costs of sales activity are assigned to customers based on the driver "number of customer visits" and there is a great variation in time spent serving the customer, that may make "easy to serve customers" less profitable than they really are. (IMA 2010) In this case the latter driver is more accurate. However, the balance between the accuracy and the complexity must be maintained. Also, the former driver can be accurate *enough*. (Cokins & Capusneanu 2010; van Raai et al. 2003)

For CPA purposes, three types of costs can be identified: (1) Product costs; (2) Costs to serve; (3) Business sustaining costs. First two are costs related to customers and the third one is costs that are not related directly to customers but are essential for the business. Customer costs are "all costs necessary to provide the product or service line to the customer". (IMA 2010)

Product costs are direct costs related to products (e.g. direct material and direct labor) and the support costs of manufacturing or service-line including indirect costs related to them. *Cost to serve* consists costs that are not related to products but customers directly (e.g. selling, distribution costs or post-sale service). *Business sustaining costs* are not related to products or customers, hence, cannot be traced causally to them – any allocations of business sustaining costs are arbitrary by nature. However, they are needed to sustain the business and cannot be eliminated or even decreased without damaging the business. Revenues must cover these costs of course, and consequently these costs must be taken into account when making pricing decisions, but allocating them to customers overstates their costs and can be therefore misleading if cost or profit information is used in decision-making. Examples are costs of accounting, executive salaries and unused capacity (Cokins 2015; IMA 2010; IMA 2014)

Cost model of CPA should reveal the costs that are caused originally by products and customers, and business sustaining costs, which are not related directly to either

products or customers. In the Figure 12 is presented a conceptual framework of ABC for CPA purposes. In the model, costs are traced from resources to activities, which are either direct material, product related activities, customer-related activities or activities that supports other activities. Some of the resources can be identified to be business sustaining costs, and therefore traced directly to business sustaining cost object. (IMA 2014)

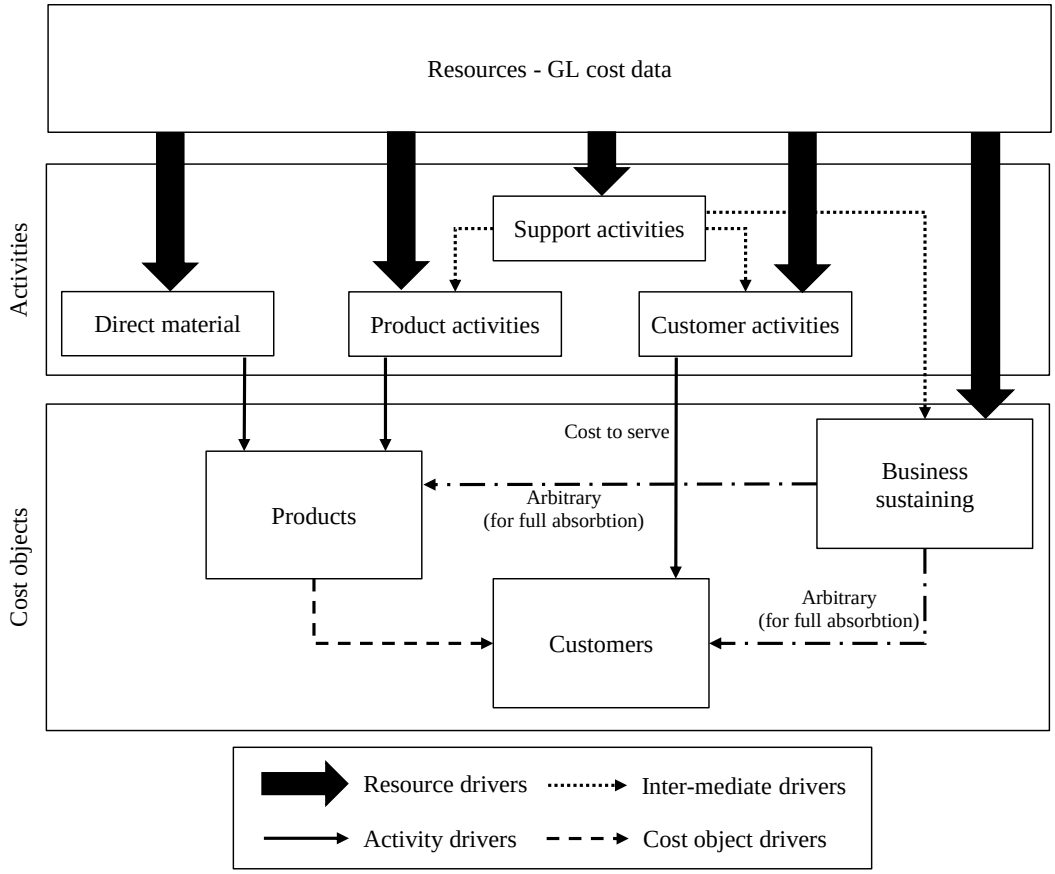

Figure 12. ABC model for CPA (adapted from Cokins 2015; IMA 2010; IMA 2014)

In the core of the ABC model here is that all traceable costs are caused originally with a demand-pull from customers (IMA 2014), and the customer is the final cost object which consumes other cost objects. In other words, customers create the need for the resource costs to be consumed. (Cokins 2015) Products or services are made for customers, therefore product costs are assigned to customers based on the customer's mix of products. Business sustaining costs can be allocated to customers or products, but they are always more or less arbitrary. If they are allocated to customers, they should be somehow visible and their nature taken into account. The

customer related revenue is assigned to customer in the final phase of the ABC calculation. (IMA 2010, 2014)

If costs are assigned to customer cost object in the manner of described above, customer profitability report or customer's profit and loss statement can be formed (Figure 13). The idea that cost to serve customers is the differentiating factor between customers who have the same mix of products is illustrated in the customer profitability report. (Cokins 2013; IMA 2010)

Customer ID	Amount	Margin %
Revenue	100	100%
Product Costs	60	60%
Customer Gross Margin	40	40%
Costs to Serve	10	10%
Customer Margin	30	30%
Corporate Sustaining Costs	25	25%
Customer Profit (EBIT)	5	5%

Figure 13. Customer profitability report (IMA 2010)

An important thing to remember: ABC itself does not increase or decrease costs. It just allocates them based on the consumption of activities. Consequently, a reduce in customer's consumption of company's overhead costs (or so called Fixed Costs) will not lead automatically to cost reduction in the company level. The costs are just allocated to remaining customers (if the overheads in the company level are not managed) causing the "death spiral effect". (Cokins 2015; Searcy & DeWayne 2004; IMA 2010)

The problem described above must be considered in the analysis of CPA and especially when deciding the actions based on CPA cost data. At first deselecting (i.e. firing) an unprofitable customer based on ABC cost data might seem an easy way to remove the "unprofitableness" from the company, but may lead to decrease of profitability rather than increase in the short term. That is due to reduce of revenue generated by customer but possible remaining of the overheads and the fixed costs. (Cokins 2015; IMA 2010; IMA 2014)

2.4 Customer Profitability in Telecommunications Industry

Research of CPA described in this thesis is scarce in the field of Telecommunications industry in B2B context. In this chapter, one study of geographically segmented CPA in B2C context (McManus 2007) and after that one study of successful ABC implementation (Major 2014) are introduced.

McManus (2007) conducted a study of geographically segmented CPA. Only B2C segment customers were included in the study, which was made in cooperation with Australian telecommunications company. The objective was to find out if there were differences in customer profitability between customers living in different geographic areas and if there were, what would be the reason for the difference in profitability and consequently difference in consumption of resources. The CPA was not conducted at a customer level but on geographical segment level, and tried to solve the problem based on the information available and not to develop current costing system itself.

The geographical segmentation model was major contribution of that study. Customers' telephone numbers were traced and formed five geographical segments: metropolitan, major urban, minor urban, major rural and minor rural. The segments were based on population of the region. All the segments were divided into three separate levels based on their revenue (low, medium and high). (McManus 2007)

The CPA was based on the principles of ABC and financial data available from past six months. Data was gathered from the existing systems and allocated to segments. The calculation was done with Microsoft Excel separated from the current accounting system. Customers who received a bill in the examination period were included in the analysis. (McManus 2007)

Costs of three areas were identified: (1) "Sales, Marketing, Support and Other costs", which included 13 sub categories (e.g. order processing costs, billing costs and customer marketing costs) (24,1 % of total costs); (2) "Field Service and Customer Access Network Infrastructure Costs", which included 11 sub-categories

(e.g. Service Network costs, repair costs network depreciation costs) (25,2 %); (3) "Network Infrastructure costs" (37,9 %), which were basically product related costs and recognized based on the customer behavior e.g. calls, minutes and revenue driven costs. Corporate overheads (12,8 % of total costs) was included in the CPA, which was requested by the management of the company and was against the recommendation of the researchers. They came to a conclusion that the analysis is performed with and without corporate overheads, which were allocated to customer segments by the number of accounts in that segment. (McManus 2007)

McManus (2007) found out that there is a difference in profitability between this kind of segments. To cut a long story short, the reason was in the increase of "Field Service and Customer Access Network Infrastructure costs", because the cost driver unit per new activation, in-place activation, equipment fault and field service visits per customer increased in the lower populated and more remote areas. However, that is average number calculated per customer in the segments, so that does not reveal the diversity of customers' profitability within the segments.

The greatest challenges in CPA studied in that study were the limitations in data gathering and unreliability and inaccuracy of cost driver data. In their study, not all products and services were included, and it was tested only for one business unit of the company. Therefore, it presented an incomplete view, due to customers' possible other contributions to the company's profits through other products and services. (McManus 2007)

The study did not solve the managerial accounting issue of customer profitability measurement, but rather simulated the "geographical segmental CPA" in separate system for the literature development purposes. The study did not examine the challenges related to ABC in CPA. To conclude, McManus (2007) suggests that case-studies of retrospective CPA should be conducted in the future due to its potential. Also, the potential of CLV based approach is highlighted and recommended to take it into account as well.

Major (2014) studied the impacts of EU telecommunications market liberalization on evolution of managerial accounting systems in a telecommunications company

(called “International Telecom”) and in general in telecommunications industry at the turn of the century. The study describes the implementation of ABC system in a not specified telecommunications company in Europe.

The ABC implemented in International Telecom was a common presentation of ABC. Its goal was to assist managers to reduce costs and improve company’s competitiveness as a management tool as well as to provide data required by regulator. (Major 2014)

In the ABC implemented labor hours were used as resource drivers. Every employee of the company had to allocate their time to the identified activities. They reported the time allocations with time sheets in Excel quarterly. ABC system contained 115 activities in total, which comprises 71 Main activities and 44 support activities. Main activities were “Activities oriented to customers” and “Activities oriented to network”. The cost objects were products and services. The allocations of activity costs to cost objects were conducted with activity drivers, which were chosen to honor costings causality principle. (Major 2014)

Costs, which could not be allocated to costs objects based on causality principle, were classified as “Common costs”, and were not allocated to cost objects but directly to “Common costs” in the income statement. Common costs were: (1) activity costs not directly related to costs objects (or products); (2) Supporting activity costs, which could not be allocated to Main activities; (3) Costs of capital that are not associated with products or services; (4) salaries and fringe benefits of the directors; (5) depreciations of fixed assets, which were not directly related to products or services; (6) extraordinary costs. (Major 2014)

To conclude, the new ABC system in International Telecom lived up to expectations in modernizing their costing system and helping them to meet the challenges of the new business climate. However, the change was not limited only to the modernization of costing system, but it was broader change in the organizational practice. The importance of commitment of the managers and employees in this kind of change cannot be overemphasized. (Major 2014; McManus 2007)

3 CUSTOMER PROFITABILITY IN THE CASE COMPANY

3.1 Present State of the Case Company

For this study Consultant A was interviewed about current costing system in the beginning of January 2018. The case company uses activity-based costing and all costs are allocated to cost objects, so it can be described as full absorption costing method. Commercial ABC software is used, and costs and revenues are feed from company's SAP system. Current ABC model is like a textbook example of activity-based costing and is presented in the Figure 14. It can be described as the first generation of ABC (Turney 2010).

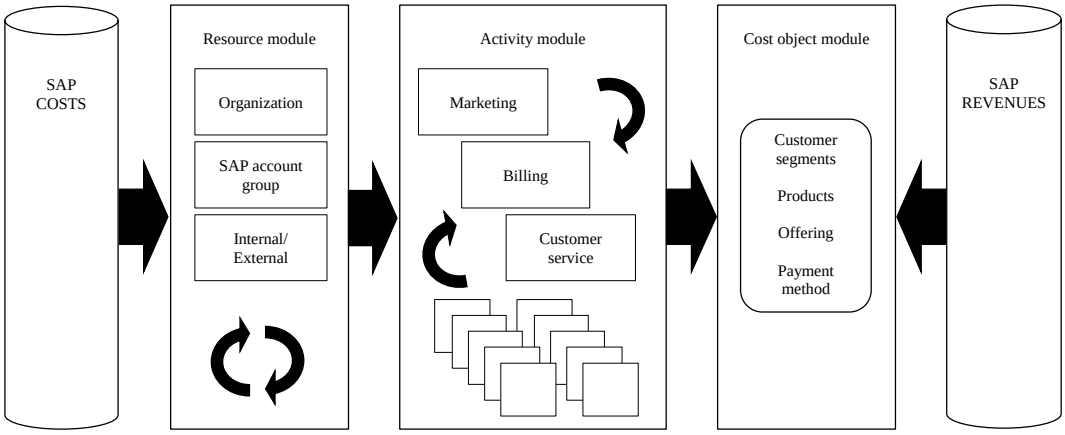

Figure 14. Current ABC model in the case company

ABC model receives costs from SAP system and they are assigned to Cost Elements in Resource module. Cost Elements are Organization, SAP account group and Internal/External. There are different organizational levels, which makes possible to have different organizational structure in different periods among other things. SAP account group is based on SAP account mapping and Internal/External is the information if counterpart is an affiliated company or not. There are numerous cost assignments made within Resource module.

Resource cost assignments to Activities are based on specialist opinion, but mainly per organization unit and also per SAP account group and direct assignments. There are 14 main activities in the activity module: Marketing, Sales, Billing, Delivery,

Customer Service, Networks and Direct Product costs given as an example. As in Resource module, there are numerous cost assignments made within Activity module and similar costs are collected together. Therefore, the concept of support activities and activity cost pools can be identified. Assignments from an activity to another activity are based on reports (e.g. number of subscriptions or traffic) and direct assignments.

From Activity module costs are assigned to cost objects in Cost Object module based on orders, traffic and number of subscriptions for example. Some of the assignments are direct assignments and some are based on revenue. Revenues are assigned to cost objects from SAP in Cost Object Module. Cost assignments are illustrated in the Figure 15.

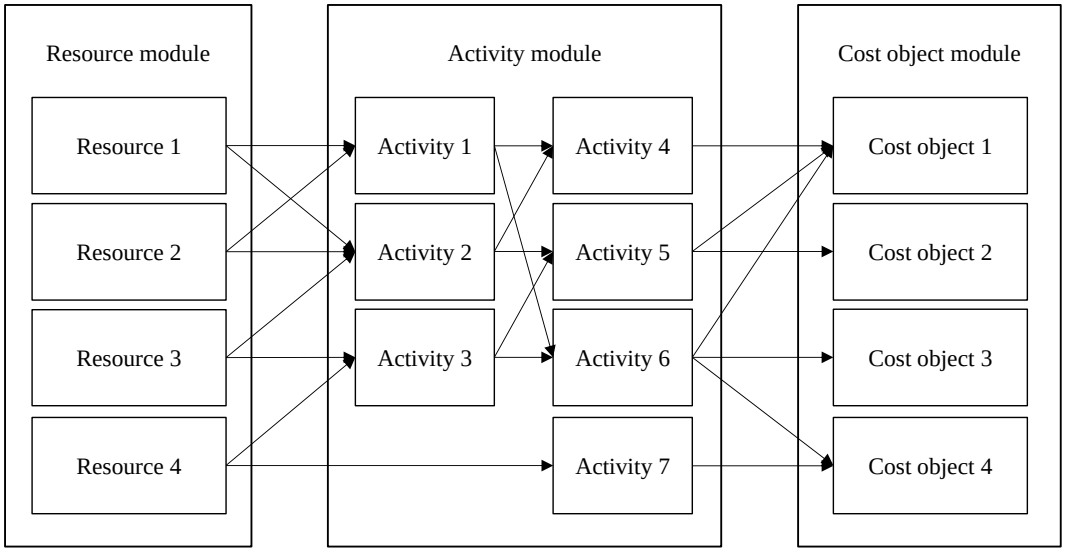

Figure 15. Cost assignments in current ABC model

Cost assignments are fully product driven, even though costs get all other dimensions (Customer segment, Offering and Payment method) in the cost object module as well. The profitability of customer segments is based on profitability of their consumption of products. In the base of the design of current ABC model is that the product is a trigger of costs.

In the case company profitability of some B2B segment contracts are calculated separately for pricing purposes, which is called customer-specific pricing. It utilizes costing data from ABC system, but the data is altered for customer level calculation

and other data is taken into account as well. The data for example customer cases in the chapter 3.3 is based on calculation in question.

3.2 Customer Profitability Analysis in the Case Company

Could B2B customer level CPA work in telecom sector and is it implementable in the case company? The answer to both questions is yes – in principle (Consultant A 2018). Activity-based costing has been adopted in telecom sector and in case company successfully and the CPA described in this thesis can be implemented in the environment where activity-based costing system can be used. Fundamentally there is no barrier which would prevent that in the case company and telecom sector in general. Certainly, there can be (and mostly are) practical problems which must be tackled. The challenges can be overcome, but that may require much effort and resources. The cost and benefit of implementation must be considered case-by-case.

There might be some legal problems that the individual person cannot be identified. However, if maintaining the focus on B2B customers (companies larger than couple of persons), that should not be the issue. The situation is different with B2C customers if measurement of the profitability at an individual customer level is desired. Nevertheless, CPA can be adopted at segment level with B2C customers as well and can be based on the same ABC model as it would with B2B customers. Yet the B2C segmentation must be made deliberately for CPA purposes.

The structure of this chapter is as follows. First the approach of CPA is described in general level in the case company. Then the actions towards CPA are described in the light of the present state of the case company. Then the possibilities and challenges related to CPA are discussed.

Overall CPA approach

There are at least two alternatives for running CPA in practice in the case company. Either separately in its own system based on routine managerial accounting calculation and transactional data available or to re-design the whole approach of costing system to support goals of CPA. The challenge in the former approach is

that the old costing system might not support the CPA, and enough and correct transactional data might not be available. Re-designing the whole managerial accounting system can be a ponderous task, but companies should have an accurate costing system to support their decision-making in any case. Whether current costing system is designed directly for CPA purposes or CPA is run in separate system the principle is rather similar. Possible CPA process in the case company is presented in Figure 16.

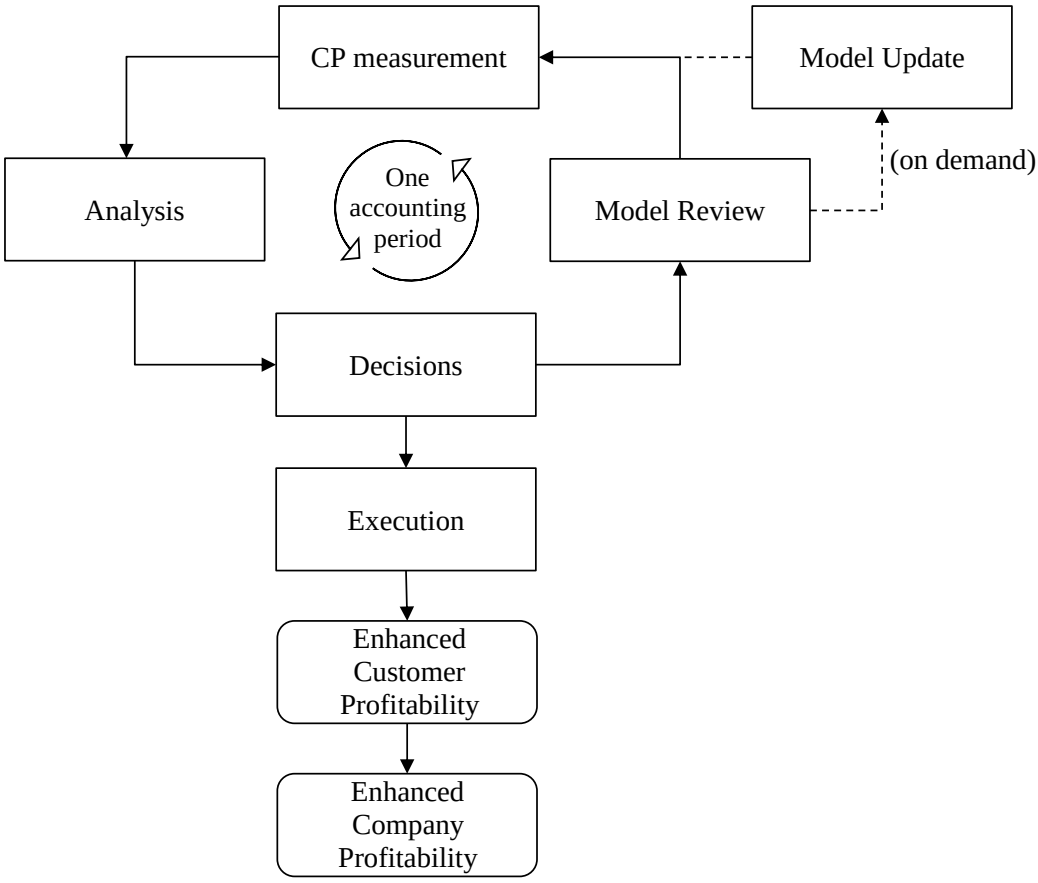

Figure 16. CPA in the case company

First phase of CPA is the profitability calculation, usually conducted with principles of ABC. The measurement should be run monthly or quarterly, preferably synchronized with company's accounting period. In either situation, the customers' profitability should be examined in longer term than one month due to the differences in lengths of the months and the other challenges related to this approach which is discussed later. The calculation do not differ from generic costing calculation in principle.

Then profitability report for every customer is formed automatically. In the customer profitability report, customer's revenue and costs related to products and services and costs to serve are made visible. In the Table 1 is presented the conceptual customer profitability report in the case company.

Table 1. Customer profitability report in the case company

Customer X (1.1.-31.1.2018)	**€**	**% of Net Revenue**
Revenue	**100**	**100%**
Costs of Products and Services	**60**	**60%**
Mobility Services, Non-data	30	30%
Mobility Services, Data	15	15%
Equipment	5	5%
Customer-specific Investments	10	10%
Customer Gross Margin	**40**	**40%**
Costs to Serve	**10**	**10%**
Sales	4	4%
Customer Service	2	2%
Delivery	3	3%
Billing	1	1%
Customer Margin	**30**	**30%**
Business Sustaining Costs	**10**	**10%**
Customer Profit (EBIT)	**20**	**20%**

The customer profitability report contains information about the revenue and costs related to specific customer for the certain period of time. In the top is customer's revenue and below that is costs of products and services. Costs of products and services contains all the costs related to customer's consumption of its products and services, sometimes referred to as "costs of goods sold". In the figure above, mobility services, equipment and customer specific investment (as depreciations) are given as an example. There can be broader view to lower levels of each row, for example the subscription level costs or costs of every single equipment can be shown if the transaction data is available. Also, the sources of revenue can be linked to products and services.

The strength of CPA is in the next section of profitability report – costs to serve the customer. Possibly the most interesting information is costs related to sales, delivery and customer service. That gives managers valuable information for decision-making purposes.

Customer's share of business sustaining costs can be shown in the report, but their allocation to customers are always arbitrary and that must be taken into account when analyzing customer's profitability and using it in decision-making. However, those costs should be covered with revenue collected from customers, so the full allocation of costs to customers can be that way justified at least for pricing purposes.

The profitability measurement of every B2B customer is followed by the analysis of the data. Customers who have not been active the whole accounting period could be marked to be hidden in the analysis. In this step customers' profitability at an individual level is known and customers can be sorted cumulatively descending order based on their profitability and formed the "whale curve" and the profitability chart based on their profitability in monetary units (Figure 4 and Figure 5 for example). Possibly those presentations of profitability of whole customer base should be run with and without the business sustaining costs to get the whole picture of the customers' profitability. Also, if the distribution of variable and fixed costs is known, the analysis can be made using just the variable costs.

The IT system should store every customer's historical profitability data. When examining the profitability of individual customers, it is the examination of trend which should be given the most effort. That is because ABC offers only a snapshot view to customer's profitability and is always limited. Unprofitable customer today might become profitable customer in the future. For example, the investment may make the customer appear unprofitable, but it may generate profits in the future. Consequently, customer may be profitable if viewing the customer's life cycle. The analysis based on just the short timespan may lead wrong decisions and actions.

The objective of the whole CPA is to identify which customers are profitable, approximately break-even and which customers generate the losses and based on that to make correct profitability enhancing actions. In the analysis phase, the customers can be tagged with the information of profitability (profitable, break-even or loss). That knowledge can be used in the analysis and the decision phases. The idea is to see behind the numbers, to find the reasons for a state of customer's profitability and to decide the actions to be executed.

The appropriate analysis makes possible the next step, the decision-making. However, the decisions must be made carefully, and one must not rush to execution. ABC and hence CPA is modeling the reality, not the absolute truth and is always somewhat inaccurate. Also, the CPA data does not directly tell what to do, but rather where to look. The decisions and actions require always tailor-made analysis and broader view to customer and its behavior.

When the actions are decided, they can be executed. The real difference is made in this step. This can be seen as active management of customer profitability so the employees and especially the managers must stand behind the decisions made and the whole active management of customer profitability approach. Just the analysis and measurement lead to nothing, but based on them correct decisions and actions may lead to better customer profitability and hence better corporate profitability. The consequences of the actions must be monitored afterwards and used that knowledge as an advantage in process development and improvement of the CPA model itself.

Before running the CPA again, the model is reviewed and updated (if necessary) like any other ABC system. There can be made slight adjustments to cost drivers or adding or removing customers or products. Sometimes bigger updates of model are in place. For example, when the organizational structure is changed. The cycle starts again in the beginning of the next accounting period with profitability measurement. However, the execution of the actions is separated from the accounting period and goes with its own schedule. Also, the enhancement of the profitability may take its own time.

As stated before, the CPA gives just a snapshot view to customers' profitability, and cash flow and the time value of money is not taken into account directly. A large portion of the B2B customers consumes mostly the standardized products and do not require special treatment in Telecom sector. However, there are customers which require specialized products, much service and large investments. Especially estimating the profitability of customer requiring larger investments the Net Present Value -based calculation and customer lifetime value thinking is beneficial.

Towards CPA in the case company

It has become evident that current ABC model of the case company does not support CPA approach at customer level in B2B context at the moment. The full allocation of costs to products does not make difference in customer behavior and cost to serve at customer level. The goal of CPA is to reveal the difference between customers apart from their usage of products and to provide accurate cost and profitability information at customer level for whole customer base. Hence, the foundation of CPA thinking is that customers that consume the identical product mix are not equally profitable.

If comparing two approaches for CPA implementation – separate system based on current ABC and re-design of the ABC for CPA purposes – both are possible in the case company in principle. If separate system is chosen, customer related transaction data should be made available and the current ABC data should be modified to support customer level CPA. That can be even as laborious as designing the new costing system and still being not accurate enough. As an advantage can be seen that it does not interfere the current costing principles if the current system is found functional itself. That approach has been investigated at case company in the past, but not implemented for some reason (Consultant A 2018).

In general, ABC is designed based on the chosen cost objects and that defines the logic of the whole ABC model. That point of view supports the re-design of ABC system for CPA purposes since the cost objects are different in CPA than they currently are. According to Consultant A (2018), the project of re-designing just the ABC system to support CPA is laborious task could take a few years. The other

thing is the magnitude of changes required in other IT systems and processes, but more about that below.

Prior to re-design of costing system, strong support from the management of the company is required as in any other major change in company as well as the sense of ownership by personnel. The goal must be clear, the project planned carefully, and the necessary resources given to project. The system could be designed to run separately apart current system at first. After testing and improvement of system it could be taken as primary managerial accounting tool.

The purpose of measurement must be defined early on, so the system designed supports the goals it should support. If the goal is to measure the customers' profitability, the system must provide the cost data which reveals the costs of a customer in the most detailed level as possible. If the focus is in the employee performance measurement, the cost data it reveals should reveal controllable costs by employees in question.

The cost system works like any other ABC model (Figure 17). Costs are assigned from resources to activities, and from activities to cost objects. Activities in the situation of case company could be: Direct material, Product and Service activities, Network activities, Customer activities, and Support activities. Network activities are actions related to network infrastructure. They can be traced to products and services, in some cases to business sustaining cost object or to customer, but that depends on the characteristics of network costs.

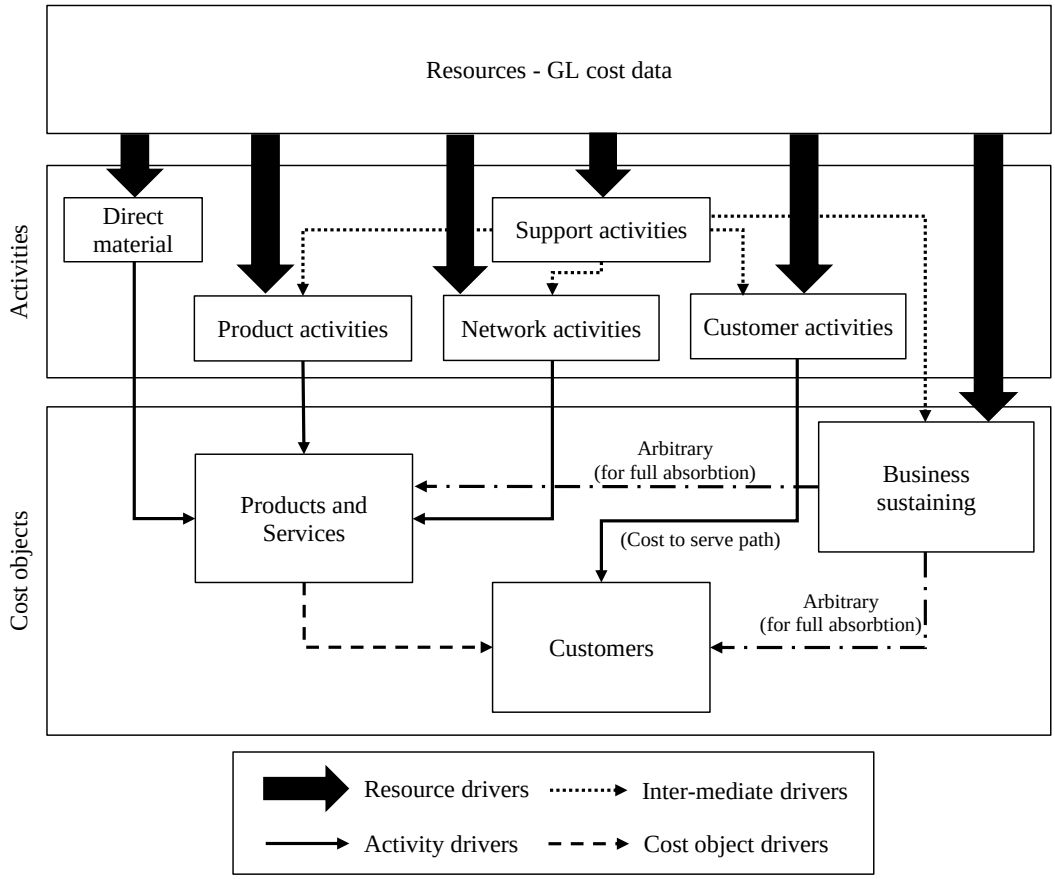

Figure 17. Conceptual ABC system for CPA purposes in case company

The cost objects are Products and Services, Customers and Business sustaining in the new approach. Customers could be identified by their Business ID number or by customer number. Also, the other cost objects and dimensions can be taken into account if necessary. Regardless, customers consume all the other cost objects and being that way "the final cost object". However, business sustaining costs are slightly a different case.

Business sustaining costs are costs of accounting, administration and capital for example. Also, marketing could be seen as brand marketing in Telecom industry, not marketing a specific product, and hence those costs could be allocated to business sustaining cost object. In any case, business sustaining costs are costs that are not directly associated with the other cost objects. Costs in question can be allocated to customers for full allocation purposes but is more or less arbitrary. If allocated to customers, they should be visible, and decisions made with caution.

To be able to build accurate costing system the customer and product related processes should be identified in the most detailed level as possible (or is necessary). Based on identified processes the customer related activities can be recognized and the relevant cost drivers chosen. Similar activities can be gathered and formed "activity cost pools", if they can be traced to cost object with same cost driver. For example, the average time used by employees to process orders or delivering an order should be examined if that level is accurate enough. If the variation in processing times are major, then the averaging is not the best solution possible. Also, if the process varies a lot with different products or customers, it should be taken into account.

The transaction data is one of the most important factors in CPA. For instance, all the contacts made to customer service should be traced to customers, and that is possible only if the company possesses the data for it. Other example is the time distribution of salespersons: company should be able to link the efforts paid to customers by salespersons to accurately trace the sales costs to correct customers.

The other challenge is the compatibility issues with the external subcontractors. Since most of them use their own identification numbers related to orders or customers and they are not traceable directly to customer they were servicing. For instance, the subcontractor who provides the investment for customer, which is completely or partially paid by case company. The bill sent by subcontractor to case company does not contain the customer identification for each individual job done. Optimally this data should move from the subcontractor's IT system automatically. That would require harmonization of IT systems between case company and subcontractors.

The full view to customer is also essential. All the data of products, contracts, traffic and interactions should be found in one place. That is lacking in the case company at the moment and should be solved weather or not the CPA is implemented. Without the knowledge of customer's product mix, the product costs are difficult to trace to customers. However, the similar products can be gathered in the same "product pool" and that way simplify the cost modeling.

The valuable information for decision-making purposes could be the knowledge of variable and fixed costs. If that distribution was known at a customer level, the impacts of losing that customer would be better understood and the decision-making better informed. Also, which costs are altered by customer behavior and which are not? Which costs are altered by the employees' behavior and which are variable in the long run, but fixed in the short term? Those are the things to consider from the general cost management as well as CPA point of view.

The costing software used sets some limitations for implementation of costing system for CPA purposes. It is possible that current ABC software does not support the multilevel cost objects and customer profitability reporting. Even if it supports that kind of approach, the design of the model and implementing the software requires software professionals. One possibility is to purchase software which is designed for CPA approach and implement it with software provider. That might save valuable time and resources.

The focus has been on the customer level profitability in B2B context. However, the major part of the business of the case company is the B2C segment. Having two separate costing systems is not efficient and practical by any means, hence the ABC system should be designed for B2C purposes at the same time. In this thesis the B2C segment is not examined, but it must be planned in the initial phases of the possible CPA design.

Possibilities and challenges related to customer level CPA in the case company

When it comes to possibilities of CPA, it depends strongly on how the model is built. The more detailed the process descriptions are and costed, the more accurate model can be. The more accurate transaction data is, the more accurate the whole model can be. The cost objects chosen defines a lot what CPA can tell. However, there can be described the possibilities and challenges related to customer level profitability calculations and CPA in general.

The strength of CPA is that it makes visible the profitability of the whole customer base at an individual customer level and providing information for decision-making purposes. The ability to identify profitable and unprofitable customers is value itself, but actions based on that knowledge makes the difference. Why customer appear profitable or unprofitable? How to drive customers towards better profitability?

The cumulative "whale curve" and profitability distribution chart formed in CPA cycle gives valuable information about the subsidizing effect in the case company. Which customers are the most crucial customers from the profit generation point of view and what are their share of the customer base? Are there customer relationships who are not profitable but important in other ways, e.g. for marketing purposes?

Based on the identification of customer profitability, the analysis can be made about what kind of customers are profitable and hence worth of focusing the resources in their acquisition and retention. The CPA gives the ability to conduct analysis at a customer level, but based on that different groups can be formed adaptively and examined the profitability on a group level as well. What is the customer profitability distribution in certain business segment or among the customers who uses much EU-roaming for example?

The CPA can be used to make customer lifetime analyses despite its retrospective approach, but the nature of the CPA must be kept in mind by the persons conducting the analysis. If the history of customer profitability data is stored in the IT systems, the data can be used to form customer's profitability graph at an individual level based on monthly values. Based on that, identifying what kind of customer types could become profitable in the future and why. Accordingly, what kind of customers remain less profitable or even unprofitable in the longer term? Also, if investments in customer profitability of certain customers are made, that can be monitored if it has been successful.

The retrospective approach is problematic because fundamentally it does not tell directly anything about the future. Also, if the analysis is based only on the current accounting period the picture given of customer's profitability can appear divergent than the profitability in the longer term. In the Figure 18 is presented customer's EBIT on monthly basis for first six months and the year average. There are months where customer's EBIT is slightly above 10 % and the average being around 20 %. The customer does not seem very profitable.

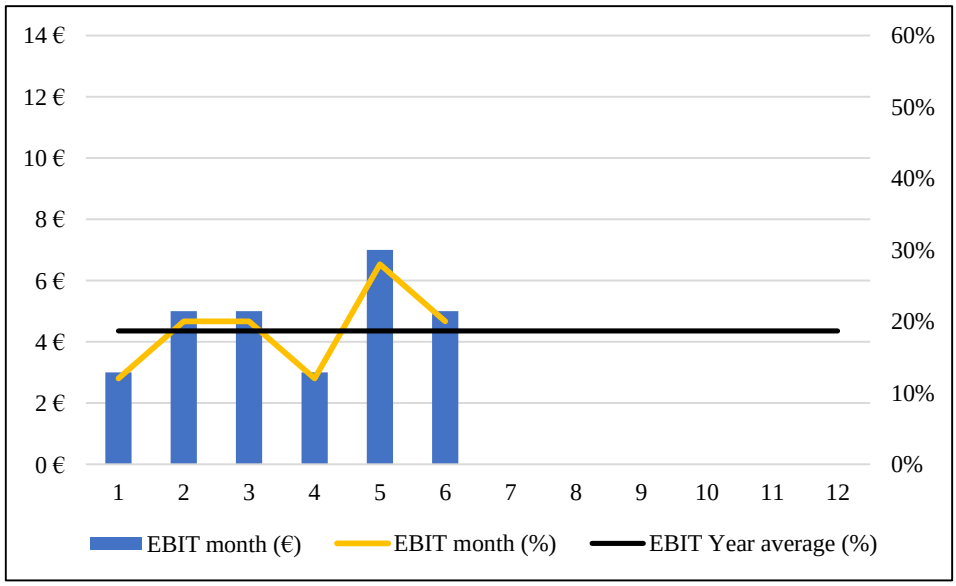

Figure 18. Customer EBIT for first 6 months

If looking at the next six months of the profitability of the same customer presented above, the situation has changed (Figure 19). The depreciation of customer specific investment has ended and customer's EBIT is above 50 % for three months. The depreciation of the replacement investment begins in October and the monthly EBIT returns to 40 % but being still very good. The average profitability for the year is a little above 30 %, which could be considered good enough.

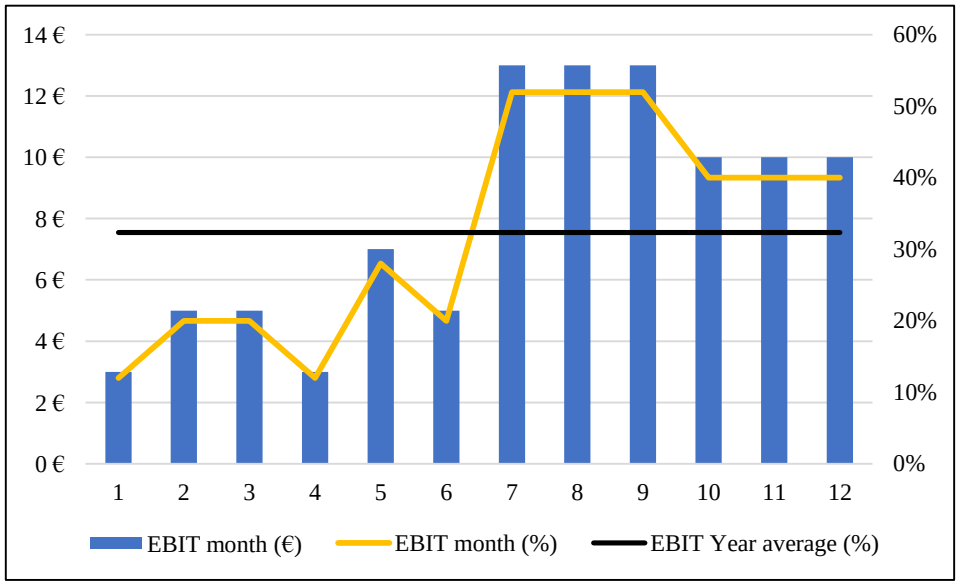

Figure 19. Customer EBIT for first 12 months

For sales support purposes CPA is a useful tool. At salesperson level the concept of "traffic lights" could be utilized based on the label (profitable, approx. break-even and unprofitable customer) given in the analysis phase. In the sales process, the salesperson could get the idea of customer's current and historical profitability and that way decide what kind of actions to take. Because the label is based on the profitability data reflecting the past, the label must not be the only thing to consider when deciding the approach salesperson takes. Also, the label must be based on the historical data related to customer, not just the previous accounting period.

The main thing is that persons who use the CPA data for decision-making purposes get guidance on how to apply the information in decision-making process. The person who makes decisions based on data, must be able to interpret the data and ideally to understand some of the calculation logic in the background to get the full advantage of the system. Equally important is to have the idea of model's strengths and weaknesses.

In the analysis phase and in the usage of CPA in decision-making, the danger is in misinterpretation, granularity and availability of the data. Wrong decisions can be made due to misinterpretation as well as just due to imprecise information. The data availability problem might be a result of complex and old systems which do not

adapt to the change of the business environment in the case company and in general. The data systems and software may not “talk” to each other.

CPA data can be used to benchmark sales based on profitability information. There is a relation between ABC system’s activity drivers and balanced scorecard if the activity drivers are accurate enough to illustrate the actions made by employees. If profitability used for employee performance measurement, measured employees must know how they can affect to the profitability and thereby possibly to their bonuses.

All costs are not controllable by specific person, for instance the salesperson may not have the influence on the delivery costs. That is a challenge if the total profitability of customer is used in employee measurement for that salesperson. And if the system is not designed to reveal those controllable costs (or they are minor), that may lead to unsuitability of its usage in salesperson’s performance measurement. Overall, the CPA should reflect the customer’s profitability.

In general, the one single profitability number might not be practical to use in employee measurement due to the retrospective nature, inaccuracy of profitability measurement and the cost controllability issue. The challenge is also the allocation of customer-related efforts which are not targeted to any customer used in measurement. For example, where to allocate the costs of unsuccessful sales efforts? They could be allocated to successful sales of that salesperson in question or to all current customers for instance. That depends on the approach chosen for usage of the CPA data. For employee measurement purposes the former approach might be practical but may cause resistance among salespersons. However, it would distort the current customers cost data.

The performance measurement by profitability number could be broadened to sales team level. The more practical approach to usage of profitability information in rewarding the sales persons might be to measure it at a team level. That way one single sales case has a smaller impact because looking at broader picture but that guides salespersons to act in order to improve profitability. That would require the IT systems to identify the service costs on a sales team or even salesperson level

and being able to link them to customers and the sales events. The most important thing is still that the salespersons must be able to have an effect to measured factors, in this case to profitability. If that is not possible, the profitability number is not usable in salespersons' performance measurement.

Product costs and costs to serve are reported separately in the customer profitability report. That reveals the cost to serve and allows the examination if the cost to serve is in balance with the cost structure and the revenue generated by customer. Also, profitability analysis of products can be made in more detailed level, because all costs are not allocated to products but only the product related costs are visible.

Being able to identify the distribution of fixed and variable costs at a customer level gives valuable information in the situation if a customer is about to churn. If most of the costs are variable, then losing a customer do not have that great an effect in the profitability at company level due to the "loss" of many costs along with the loss of customer and revenue. If the fixed costs are most of the cost distribution, the revenue is lost but most of the cost are allocated to other customers making them to appear less profitable. In the company level it affects to profitability in a great manner, because of the revenue is lost but most of the costs remain in the company.

Next the logic behind the variable and fixed costs in the situation of losing a customer is illustrated. In the Figure 20 is presented customer level calculation for Customer X and Y, and presented the company level calculation. In this situation the Customer X is retained (or acquired). In this example all the customers (50 customers) are presumed to be identical. In the starting situation Total Costs (TC) are 3000 € and Variable Costs (VC) are 25 % and Fixed Costs (FC) are 75% of the Total Costs.

TC	60,0 €	Customer X (win)	
VC	25,0%		
FC	75,0%	Revenue	100
		./. VC	15
		Contribution margin	85
		./. FC	45
		Gross margin	40

TC	60,0 €	Customer Y	
VC	25,0%		
FC	75,0%	Revenue	100
		./. VC	15
		Contribution margin	85
		./. FC	45
		Gross margin	40

Company level	(50 customers)		TC	3 000 €
			VC	25,0%
Revenue	5 000	100%	FC	75,0%
./. VC	750	15%		
Contribution margin	4 250	85%		
./. FC	2 250	45%		
Operating profit	2 000	40,0%		

Figure 20. Starting point of the example calculation

What happens if Customer X is not retained but lost? The revenue is lost for that customer but also the variable costs do not occur. However, the fixed costs remain in the company in the short term and are usually allocated to other customers. In this example, illustrated in the Figure 21, the company level fixed costs remain the same, but Customer Y and all the other customers appear less profitable even though they have not changed their behavior or product mix at all. Consequently, if some of the customers are not considered profitable enough again and then deselected (i.e. “fired”), the other customers appear again less profitable even though the situation with them have not changed. That is called “the death spiral effect”. Important thing to remember is that all costs are variable if the time period examined is extended enough.

TC	45,0 €	Customer X (loss)	
VC	0,0%		
FC	100,0%	Revenue	0
		./. VC	0
		Contribution margin	0
		./. FC	45
		Gross margin	-45

TC	60,9 €	Customer Y	
VC	24,6%		
FC	75,4%	Revenue	100
		./. VC	15
		Contribution margin	85
		./. FC	45,9
		Gross margin	39,1

Company level	(49 customers)		TC	2 985 €
			VC	24,6%
Revenue	4 900	100%	FC	75,4%
./. VC	735	15%		
Contribution margin	4 165	85%		
./. FC	2 250	46%		
Operating profit	1 915	39,1%		

Figure 21. The example situation when Customer X is lost

The problem illustrated above could be tackled with the management of unused capacity (IMA 2014). That way the rate for used capacity would not change constantly and death spiral effect would not occur. Also, that makes unused capacity visible in the ABC reporting. The capacity could be costed by dividing the costs with the practical capacity (Figure 22).

Cost of capacity	2250	€
Practical capacity	1000	units
Capacity cost rate	2,25	€/unit

Customer A used 20 units of capacity
→ 20 units * 2,25 €/unit = 45 €

Figure 22. Costing the capacity and Customer X's usage of capacity

Customer X used 20 units of practical capacity. When the customer is lost the capacity is released for usage. In the example situation, the cost of capacity (45 €) is traced to ABC's business sustaining cost object on the contrary to traditional way of allocating that to other customers or products (Figure 23). That reveals the unused capacity and that knowledge can be used in decision-making.

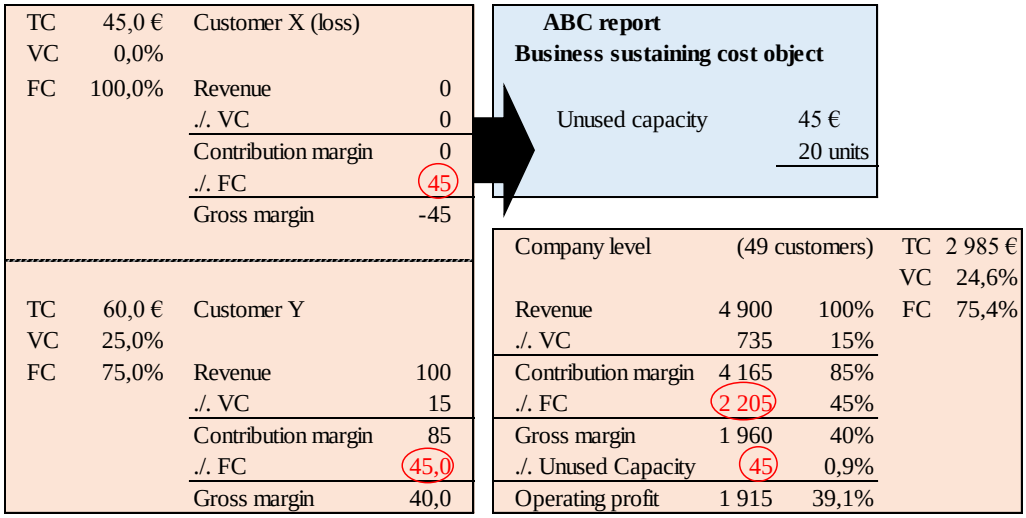

Figure 23. The illustration of capacity costing in customer loss situation

If fixed and variable costs are known at the customer level, that gives possibilities for different analyses and new information about the customers and the costs for decision-making purposes. That way the analysis could be made using just variable costs. That gives the possibility to look at the customers from different perspectives.

The identification of company's processes is important step of the creation of costing model and thus CPA. That way the process costs can be identified in relation to customer behavior and service. For example, what makes delivery expensive and how could that be made more efficient? Or what makes the sales activity expensive (or efficient) for certain customer or customer type? Is it beneficial to make customer specific projects and planning? This kind of speculation is possible if the processes are well illustrated and costed.

CPA gives view to customer's product offering, costs and profitability. That knowledge can be used for pricing decisions and customer specific pricing. Too straightforward decisions should not be made, but as a tool for pricing CPA can be well utilized if the user is aware of the strengths and weaknesses as well as the calculation logic of the profitability. Net Present Value based analysis could be made in addition to CPA.

The challenge of CPA is that it does not illustrate the cash flow and investments are allocated to cost objects as depreciations. In the Figure 24 is illustrated the different

views to the customer's profitability in one example year. The investment (120 €) is made in the beginning of the year and the earnings are constant and received always at the end of the month. If looking at the Cumulative Cash Flow generated by customer, customer is profitable after eight months, but the monthly EBIT do not reveal that, because the investment is allocated to customer with depreciations every month. That is not a problem if it is taken into account when analyzing the customer's EBIT. In this illustration, the calculation is presented under the accrual basis of accounting, not under cash basis. Cash flow -based investment calculation would be done in reality under cash basis of accounting, which is linked to rules of accounting. That leads to thinking of how accounting systems and cost accounting systems are linked together. However, the goal of the Figure 24 is just to give the idea of the different views.

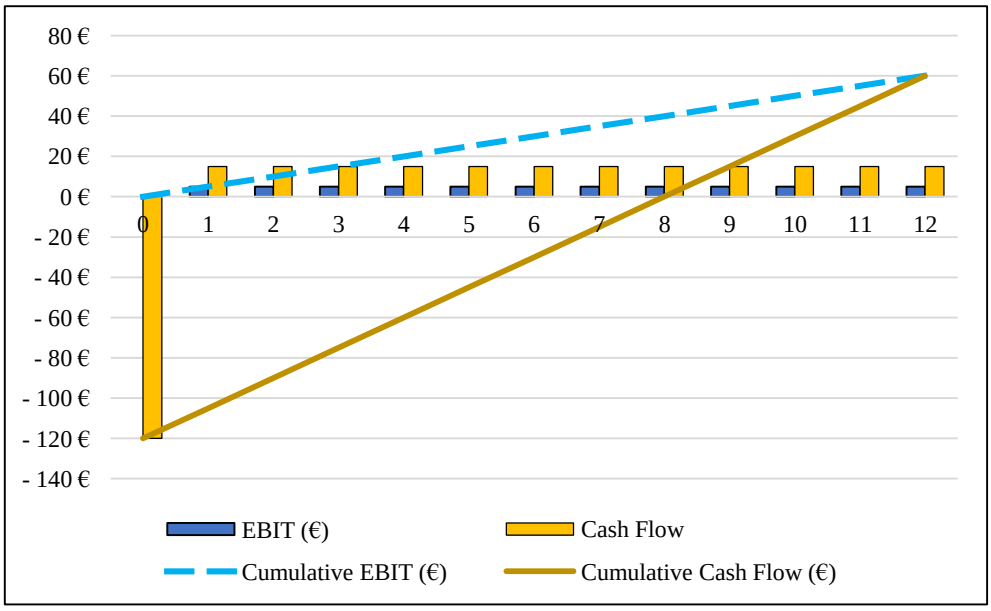

Figure 24. Different views to customer's profitability

In the figure above is illustrated also how the cumulative illustration of EBIT could look like. The thing to consider is that it does not illustrate the cash flow due to investment has taken into account via depreciations and not on cash basis like the cumulative cash flow line in the figure shows (scheduled depreciations might be demanded in the rules of accounting). But of course, there should be defined what is an investment and what is just an annual cost.

3.3 B2B Customer Profitability – Example Cases

For customer profitability report simulation purposes four different B2B customer cases were selected. The goal was to illustrate how those customers' profitability could appear in the CPA approach. The example customers are based on real customer cases, but the data is disguised, and the offering altered in order to prevent recognition of customers and the pricing principles.

Customer cases where chosen with pricing expert in the beginning of the 2018. To make things clearer, only the mobility services, which contains domestic and international voice subscriptions and domestic data and data roaming were included in the cases. Mobile Center service was included as well. For one customer, customer specific investment for mobile coverage improvement was simulated.

Pricing of the products are conducted with packed pricing, which means that subscription contains certain fixed amount of calls, messages and data. Subscription level cost and behavioral data is not available due to privacy protection. That leads to broad averaging at a customer level. Some subscriptions may use more voice and data than the others, even exceeding the packet limit and hence leading to extra payments and costs.

The product mix of customers is also simplified and altered for modeling purposes. The customers have the same kind of packet subscriptions and all the subscriptions are the same within a customer and that way they seem mostly very profitable. In real case the product mix is better built to suit the customer's needs in the subscription level.

Example customers are portrayed in the Table 2. Customers A and B are both large companies. Customer C is rather small company and Customer D is a public entity. The contract period is 24 months for all the example customers and their product mix rather similar.

Table 2. Synthesis of example customers

		Customer A	Customer B	Customer C	Customer D
General	Revenue (€/year)	261 215	130 521	14 787	39 056
	Contract period (months)	24	24	24	24
	EBIT-%	52%	56%	36%	57%
Voice	Mobile subscriptions (number)	367	454	37	177
	Domestic Calls (min/subscription/month)	138	111	433	69
	Calls made abroad (min/subscription/month)	9,9	2,5	3,9	0,1
	Received calls abroad (min/subscription/month)	6,6	2,2	2,3	0,1
Messages	Domestic messages (no/subscription/month)	28	11	36	19
	Messages abroad (no/subscription/month)	3,3	0,8	1,4	0,1
Data	Mobile data subscriptions* (number)	473	472	87	214
	Domestic mobile data (MB/subscription/month)	14 222	2 592	2 645	422
	Data Roaming (MB/subscription/month)	324,1	18,6	60,1	0,5
	*Data subscriptions + subscriptions incl. both data and voice				

Customer A's annual revenue is 261 215 euros, which is twice as much as Customer B generates (130 521 €), even though the total number of subscriptions is almost same (473 and 472 subscriptions). The characteristic of Customer A is that they have 106 data only subscriptions and they use large amount of domestic data on average (14 222 MB) and relatively much data roaming (324 MB), which are priced in the contract. Customer B has average consumption of data. Customer A uses also voice services abroad.

Customer C is a small company with only 87 subscriptions total, most of them (50 subscriptions) contains only data. This customer's characteristic is that it uses the voice allocated to packets much better than the other customers examined, 433 minutes per subscription per month. Also, some data roaming is used, possibly there are a few employees who travels and uses roaming. The reason for significantly lower EBIT compared to others are the better usage of voice and roaming data allocated to customer.

Customer D is a medium sized public entity. The characteristic is that usually public entities in general do not make much calls or send many messages and they do not use their subscriptions abroad basically at all. Also, the voice subscriptions do not use data priced in the packet in this case. Customer D has some data usage and that is generated by a few data subscriptions. In general, public entities usually use mobile subscriptions mostly to receive calls. Due to the termination rate of calls made from another tele operator's subscription may change the real profitability of that customer. Termination rate is a charge which one tele operator charges from another tele operator for incoming calls to its network.

Categories to highlight in the Table 2 are "Received calls abroad" and "Mobile data subscriptions". The former is presented because receiving calls abroad generates considerable costs. The latter mentioned contains normal voice subscriptions which contains also data and the data subscriptions only which do not contain any voice.

The premise of customer profitability report simulation is the revenue and cost data from customer cases described above. First the cost structure of every customer is illustrated and then described how they could appear in the customer profitability report of CPA. For simulation purposes the segment level profitability data from current costing system is utilized for estimation of costs to serve. Customer specific investment is simulated by the case of Customer B and with Customer C is simulated the effect of growth of cost to serve.

Currently all the costs are allocated to products. For profitability report modeling purposes those costs are distributed to costs of products and services, costs to serve and business sustaining costs. The share of business sustaining costs is estimated based on the literature of the cost structure of telecom industry but may be totally different in reality. Also, the costs to serve is an estimation from company level data. The remaining costs are hypothesized to belong to products and services.

Customer A

Customer A, a large company which uses much data and subscriptions abroad, has also a mobile center service. Their cost structure is presented in the Figure 25. The largest share of costs is due to the major usage of domestic and roaming data (52 % of total costs). Some of the costs are allocated to subscriptions, not based on the usage of services, and subscriptions' share of costs seem in this case rather low due to the major data costs. In Appendix 1 is presented the costs and revenues in more detail.

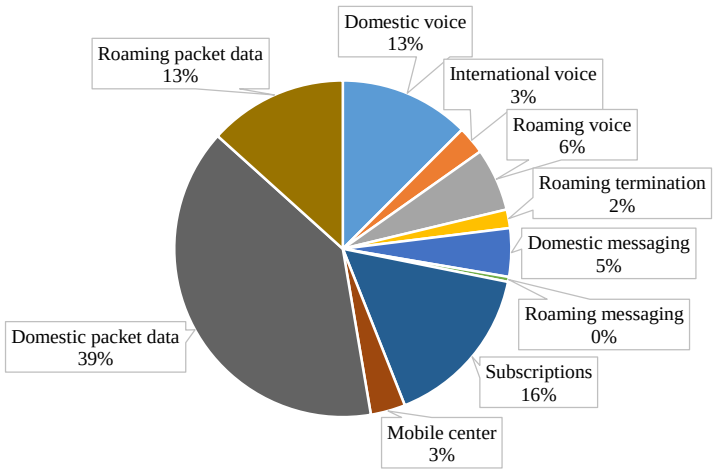

Figure 25. Cost structure of Customer A

The costs of the illustration above was generated based on the current system. In the Table 3 is presented the simulation of customer profitability report of Customer A based on the data available. In this simulation, the costs of mobility services are divided into subheadings. It is possible to build the system to illustrate costs in more detailed level (e.g. in subscription level). The idea is that the subheadings can be hidden and revealed when necessary. For example, in this illustration only the costs of mobility services are revealed. Domestic termination fee is added to be visible in the customer profitability.

Table 3. Customer profitability report of Customer A

Customer A (1.1.-31.1.2018)	**€**	**% of Net Revenue**
Revenue	**21 768**	**100%**
Costs of Products and Services	**6 750**	**31%**
Mobility Services, Non-data	3 195	15%
Domestic voice	*907*	*4%*
International voice	*196*	*1%*
Domestic termination	*192*	*1%*
Roaming voice	*440*	*2%*
Roaming termination	*129*	*1%*
Domestic messaging	*338*	*2%*
Roaming messaging	*35*	*0%*
Subscriptions	*958*	*4%*
Mobile Centre	*242*	*1%*
Mobility Services, Data	3 555	16%
Domestic packet data	*2 656*	*12%*
Roaming packet data	*899*	*4%*
Customer Gross Margin	**15 018**	**69%**
Costs to Serve	**2 333**	**11%**
Sales	930	4%
Customer Service	362	2%
Delivery	942	4%
Billing	99	0%
Customer Margin	**12 685**	**58%**
Business Sustaining Costs	**1 417**	**7%**
Customer Profit (EBIT)	**11 268**	**52%**

Customer B

Customer B is also a large company, but the usage of services is rather average overall. The greatest costs are generated by the subscriptions and domestic voice and data usage. If examining the costs in monetary units in Appendix 2 the Customer B's costs of subscriptions are almost the same size as Customer A, but due to the lower usage of data and roaming services, the relative proportion of Customer B's costs of subscriptions are almost triple the Customer A generates.

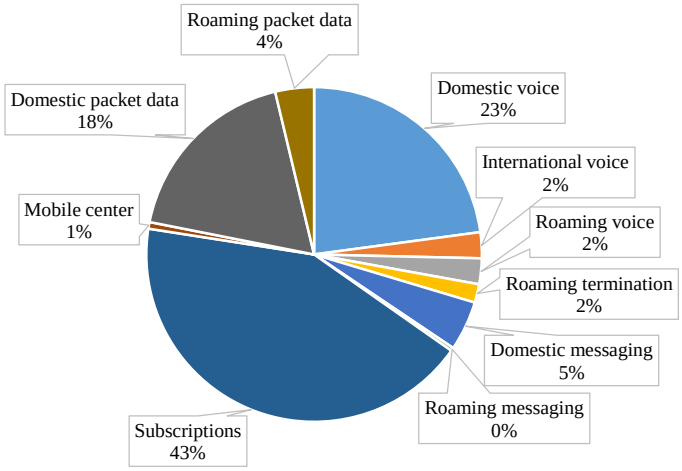

Figure 26. Cost structure of Customer B

Customer specific investment for mobile coverage improvement is simulated with the case of Customer B in the customer profitability report (Table 4). The investment of 80 000 € is allocated to customer as monthly depreciations in two years, which is the contract period of customer B. The reason for high starting EBIT of 56 % (the profitability information can be found in Appendix 2) is because customer's contract is priced plenty of data usage which they do not use much. That is the reason why costs allocated to data are small versus the revenue generated. That leaves room for expensive coverage investment which seems "free" for customer. In reality subscriptions are better built to match the customer's needs and the customer would be charged at least portion of the investment.

Table 4. Customer profitability report of Customer B

Customer B (1.1.-31.1.2018)	**€**	**% of Net Revenue**
Revenue	**10 877**	**100%**
Costs of Products and Services	**6 333**	**58%**
Mobility Services, Non-data	2 343	22%
Mobility Services, Data	657	6%
Mobile coverage investment	3 333	31%
Customer Gross Margin	**4 543**	**42%**
Costs to Serve	**1 167**	**11%**
Sales	418	4%
Customer Service	408	4%
Delivery	146	1%
Billing	195	2%
Customer Margin	**3 377**	**31%**
Business Sustaining Costs	**667**	**6%**
Customer Profit (EBIT)	**2 710**	**25%**

Customer C

Customer C is a small company and their subscription packets are better suited for their needs. That is the reason why the EBIT is 32 % and hence lower to start with than in the other customer cases described. The costs structure reveals the major costs of domestic voice and packet data usage (Figure 27). Also, the customer uses only little roaming services.

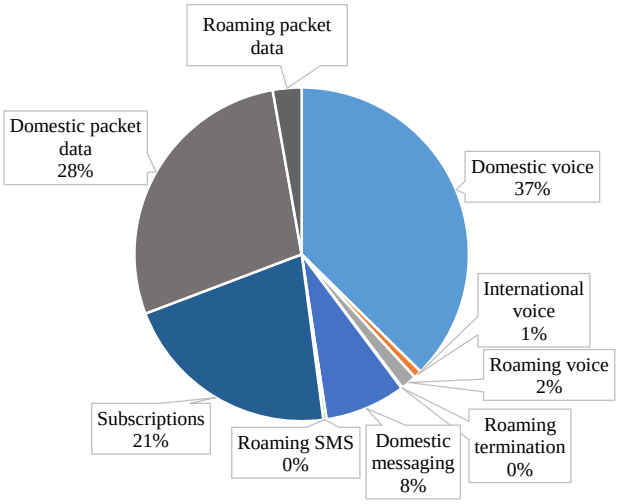

Figure 27. Cost structure of Customer C

In the customer profitability report (Table 5), the situation of high cost to serve is simulated. For simulation purposes the cost to serve is doubled compared to first assumption of cost to serve Customer C (250 €). The growth could be due to growth of sales and customer service functions. The situation could be that the sales persons had to focus more efforts on acquisition of the customer. Also, the customer could have had challenges with implementation of the services and they have made several contacts to the case company.

Table 5. Customer profitability report of Customer C

Customer C (1.1.-31.1.2018)	**€**	**% of Net Revenue**
Revenue	**1 232**	**100%**
Costs of Products and Services	**500**	**41%**
Mobility Services, Non-data	346	28%
Mobility Services, Data	154	12%
Customer Gross Margin	**732**	**59%**
Costs to Serve	**500**	**41%**
Sales	187	15%
Customer Service	202	16%
Delivery	93	8%
Billing	18	1%
Customer Margin	**232**	**19%**
Business Sustaining Costs	**83**	**7%**
Customer Profit (EBIT)	**149**	**12%**

Customer D

Customer D is a public entity, and has its own characteristics described earlier. Because Customer D do not make many calls, send messages or use much data, most of the costs are the costs allocated to subscriptions (Figure 28). However, they receive a lot of calls, which cannot be seen from this data. Starting EBIT (57 %) of customer D is due to the packet pricing of customer's subscriptions (Appendix 4). This kind of usage profile does not support the packet pricing, but the usage-based pricing, if looking from the customer's point of view.

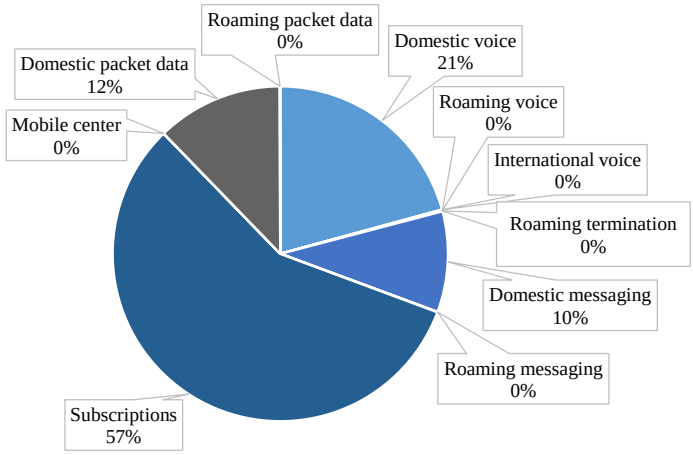

Figure 28. Cost structure of Customer D

As mentioned earlier, the Revenue can be divided into subheadings as well. In the simulation of customer profitability report of Customer D, the subheadings are made visible including revenue of interconnections (Table 6). In this case the revenue of interconnections is estimated to be greater than the average interconnection revenue of the segment of Customer D. The business sustaining costs have been altered in correlation with the growth of revenue.

Table 6. Customer profitability report of Customer D

Customer D (1.1.-31.1.2018)	**€**	**% of Net Revenue**
Revenue	**3 580**	**100%**
Mobility Services, Non-data	2 108	59%
Domestic voice	*1 099*	*31%*
International voice	*98*	*3%*
...	*...*	*... %*
Interconnections	*326*	*9%*
Mobility Services, Data	1 473	41%
Costs of Products and Services	**833**	**23%**
Mobility Services, Non-data	732	20%
Mobility Services, Data	102	3%
Customer Gross Margin	**2 747**	**77%**
Costs to Serve	**417**	**12%**
Sales	158	4%
Customer Service	110	3%
Delivery	104	3%
Billing	45	1%
Customer Margin	**2 330**	**65%**
Business Sustaining Costs	**275**	**8%**
Customer Profit (EBIT)	**2 055**	**57%**

4 DISCUSSION AND CONCLUSIONS

4.1 Review of the Findings in the Literature and the Case Company

The goal of the study conducted by McManus (2007) was to do a one-time geographical segment level analysis of B2C customer profitability. Also, a geographical segmentation model for Telecommunications company was a major contribution of that study. CPA introduced in this thesis is an ongoing calculation of customer profitability at a customer level – not on a geographical segment level or segment level at all. McManus (2007) approached the problem based on the cost and transactional data available from past six months in the current MA systems, not to develop the costing system (or ABC system) itself and the calculation was conducted separately in MS Excel apart from current IT systems. CPA introduced in this thesis is based on the development of ABC for CPA purposes and adopting it into daily decision-making.

The interesting thing in the study of McManus (2007) was that corporate overheads were included in the analysis of customer profitability, on the contrary to the suggestion by the researcher. They came to a conclusion that analysis is done both with and without the corporate overheads. The same was suggested in this thesis to reveal the customer-related costs and to fulfill the wishes of the case company. However, the nature of arbitrary cost allocations should be taken into account.

McManus (2007) had to settle for the current situation of available cost data and transactional data. He had to use greatly averaged numbers calculated per customer in the customer segments because the current costing system did not reveal the costs at a customer level. In other words, the results did not reveal the diversity of customers' profitability within the segments. On the other hand, the goal in this thesis was to be able to reveal the customer-related costs at a customer level to begin with.

The greatest challenges McManus (2007) found to be were the limitations in data gathering, unreliability and inaccuracy of the cost driver and transactional data. The same kind of challenges were found in this thesis. To conclude, McManus (2007)

did not try to solve problems related to ABC in CPA, which was one of the main focus areas of this thesis. Also, he suggests that more case-studies of retrospective CPA should be conducted in the future due to its potential and reminds the potential of CLV approach in addition to CPA like this thesis proposed.

Major (2014), on the other hand, studied the implementation of ABC system in a not specified European telecommunications company (called "International Telecom") in the turn of the century. The ABC described was a common presentation – also generation 1 of ABC (Turney 2010) – of ABC and its goal was to assist managers to reduce costs and improve company's competitiveness as a management tool and to provide data required by the regulator. The goal was not to develop ABC system for CPA purposes, but gave an idea how ABC has been adopted in a telecommunications company.

In the ABC of International Telecom, labor hours were used as resource drivers and every employee had to allocate their time to the identified activities. Major (2014) described their ABC as "complex", containing 115 activities in total. The ABC of the case company studied in this thesis has the same kind of characteristics in general. However, the International Telecom's Main activities were separated into "Activities oriented to customers" and "Activities oriented to network". That kind of separation is done also in ABC of CPA in this thesis. All the costs were allocated to products and services anyway in Major's study. The "common costs", which could not be allocated directly to cost objects based on costing's causality principle, however, were allocated separately to a specific object in the income statement. That is the same kind of idea as "business sustaining cost object" illustrated in this thesis.

4.2 Development Views of CPA in the Case Company

Retrospective customer profitability analysis is a great possibility for companies to have a view to profitability at a customer level, and to discover and target customized profitability improving actions to customers and drive them towards better profitability, and hence to improve company's profitability. CPA gives the

ability to identify which customers are profitable and which are not – it gives a view to the profitability of the whole customer base. It proposes where to look and gives foundation for correct profitability enhancing decisions and actions.

When companies shift from product-oriented to customer-oriented mindset, their management accounting should be designed to support the means to reach the strategic goals chosen. CPA is a part of the solution in improvement of the company's profitability. However, it is not an all-embracing one, but rather useful tool to reach the goals. It has its possibilities and challenges as well as its strengths and weaknesses. The personnel, employees and managers, should know how to use the tool and to approve of its usage. Due to the limitations of retrospective CPA, it could be combined with customer lifetime value thinking, which could be described as a prospective approach. Nevertheless, CPA and a accurate costing system might be needed first.

The present state of the case company does not support the CPA as it is. Major changes in the principles of ABC and IT systems would be required if CPA described in this study was implemented. It would be a ponderous task and could take a few years. Nevertheless, it is possible to redesign the ABC for CPA purposes in the case company, and consequently implement CPA in the case company and in telecommunication industry overall. That could give a competitive edge over the competitors at least in the short term if done with a broader change and used appropriately (Holm et al. 2016).

Only updating the current costing and IT systems to support CPA does not help or improve profitability. It is the correct actions that make the difference. Successful CPA implementation and improvement of customer profitability requires a change in the whole organization, the mindset of employees and managers. Regardless, the customer should be in the spotlight, whether or not CPA is implemented.

Data used in example cases were altered and disguised in order to prevent the recognition of current costing and pricing principles. Also, the view to costs at a customer level is currently limited overall. Therefore, the example customer profitability reports are more descriptive and suggestive than the exact illustrations

of profitability of customers in question. However, they give the idea what kind of information the report could provide.

Generally speaking, the cost drivers obtained from current ABC system to customer level case calculations are greatly averaged, and thus do not tell straight much else than customer's usage of products. For customer-specific pricing purposes they can be used, but also customer-specific costs and costs to serve should be taken into account separately due to the product-driven approach of the current ABC system.

Even though the CPA would not be implemented, the clear view to customer cost structure and the size of the cost to serve would be valuable to find out. Also, the division to variable and fixed costs could bring new possibilities for management purposes. Also, the impact of the termination fee for customer's profitability could be investigated more.

The other thing to consider in the case company is to change costing principles towards costing the practical capacity and to allocate the costs to customers or customer segments based on the usage of the practical capacity. The unused capacity would be allocated to "business sustaining costs" of a sort in the ABC model. That way the unused capacity would be visible, and costing would honor the costing's causality principle better. For pricing purposes, the unused capacity costs could be allocated somehow to customers, e.g. based on revenue, but would be more or less arbitrary either way.

4.3 Future Proceedings and Research

The requirements for CPA adoption should be investigated next in the broader scale in the case company. Cost and benefit of CPA implementation should be analyzed, and project plan written. Maybe the most important thing: the management of the company should consider if they want to adopt this kind of approach and use it in decision-making, because the measurement of the customer profitability is useless if it is not used in decision-making and without accurate profitability improving actions done.

Future academic research should be conducted about combining CPA and CLV approaches to get a broader view to customer's profitability: How they could work together in theory and how they could be applied together in practice? Are both of those approaches needed at the same time in the first place or do they function better if used separately?

When it comes to CPA and other approaches to customer level profitability in the field of telecommunications industry, the topic should be studied more to get a better idea of their applicability. Especially, is the cost–benefit of CPA implementation favorable in telecommunications companies in general?

The other interesting topic is the linkage among CLV, Customer Equity (CE) and value of a company. CE can be seen as "the sum of all current and future customers' lifetime values" (Gleaves et al. 2008) and CE could be linked to the value of the company (Bauer & Hammerschmidt 2005; Gupta & Lehmann 2003). Research should be conducted in practice about how the concept of CE could be utilized in the companies and does CE reflect the value of the company in any way? Is the value of the customer base related to the value of the company in practice?

5 SUMMARY

In this study was investigated how business-to-business customer profitability measurement could be approached at a customer level in a telecommunications company operating in Finland. A theoretical framework of Customer Profitability Analysis (CPA) was formed to clarify the concept of CPA and CPA-related activity-based costing (ABC) system was studied. In addition, two key research papers related to CPA and ABC from the field of telecommunications industry was reviewed to support the empirical part of this study and to give a glimpse to prior research conducted in the industry.

In the study part theoretical framework of CPA was applied in the situation of the case company and CPA's possibilities and challenges were discussed. Also, a conceptual approach to ABC was presented for the CPA purposes in the in the case company as well as in the telecommunications industry. Four customer cases were introduced and used to illustrate what kind of information new approach could provide about customers. Next the research questions are examined:

"How B2B customer level profitability measurement could be approached in the case company and in telecommunications industry?"

> Customer level profitability measurement could be approached with retrospective customer profitability analysis and activity-based costing due to the present state of the case company. After the development of CPA, and current IT and management accounting systems, prospective Customer Lifetime Value (CLV) could be taken into consideration.

"What are the possibilities and challenges related to customer profitability analysis in the case company?"

> CPA could give the case company a view to profitability at a customer level and so to reveal which customers are profitable and which are not and give ability to target customized profitability improving actions to customers accordingly. Challenges are i.e. in the implementation of CPA and CPA-related costing system and the availability of transactional data.

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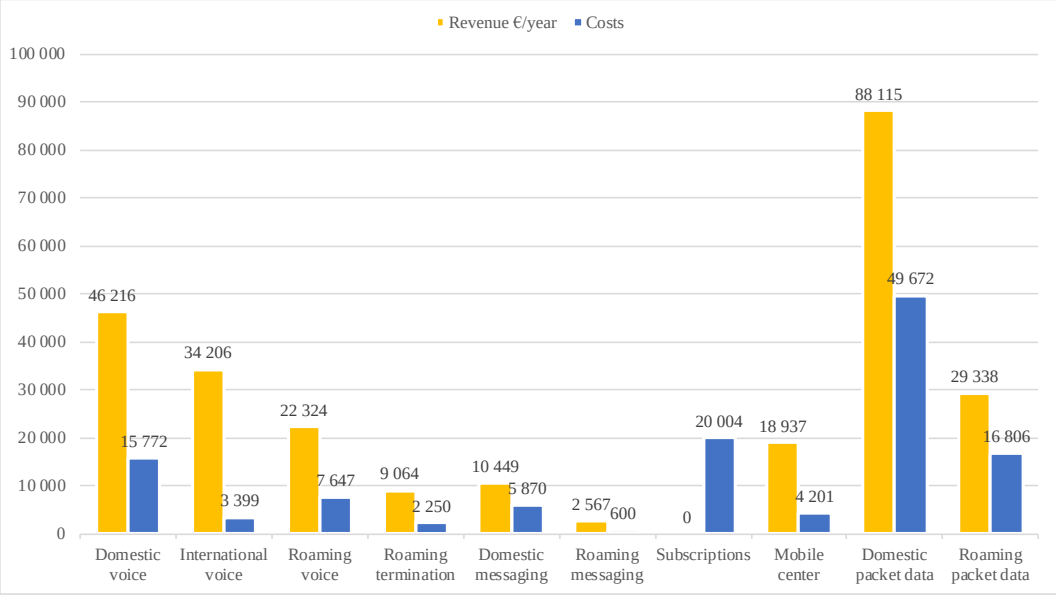
APPENDICES

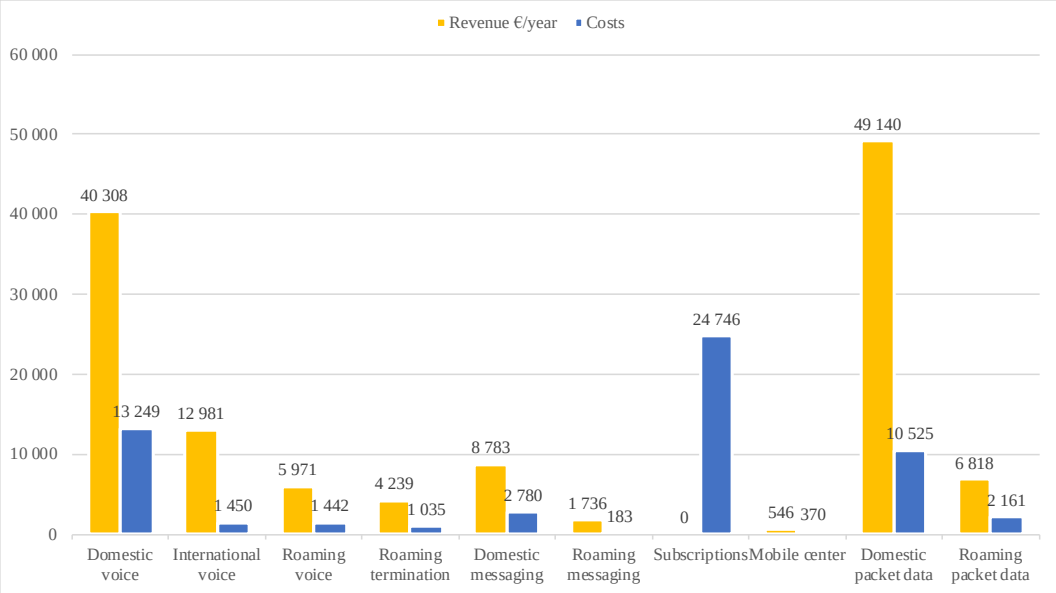
Appendix 1. Cost and Revenue Data of Customer A

Customer A	Revenue €/year	Costs €/year	EBIT €/year	EBIT-%
Mobility Services, Non-data	**143 762**	**59 744**	**84 018**	**58%**
Domestic voice	46 216	15 772	30 443	66%
International voice	34 206	3 399	30 807	90%
Roaming voice	22 324	7 647	14 677	66%
Roaming termination	9 064	2 250	6 813	75%
Domestic messaging	10 449	5 870	4 579	44%
Roaming messaging	2 567	600	1 967	77%
Subscriptions	0	20 004	-20 004	
Mobile center	18 937	4 201	14 736	78%
Mobility Services, Data	**117 453**	**66 478**	**50 975**	**43%**
Domestic packet data	88 115	49 672	38 443	44%
Roaming packet data	29 338	16 806	12 532	43%
Total	**261 215**	**126 222**	**134 993**	**52%**



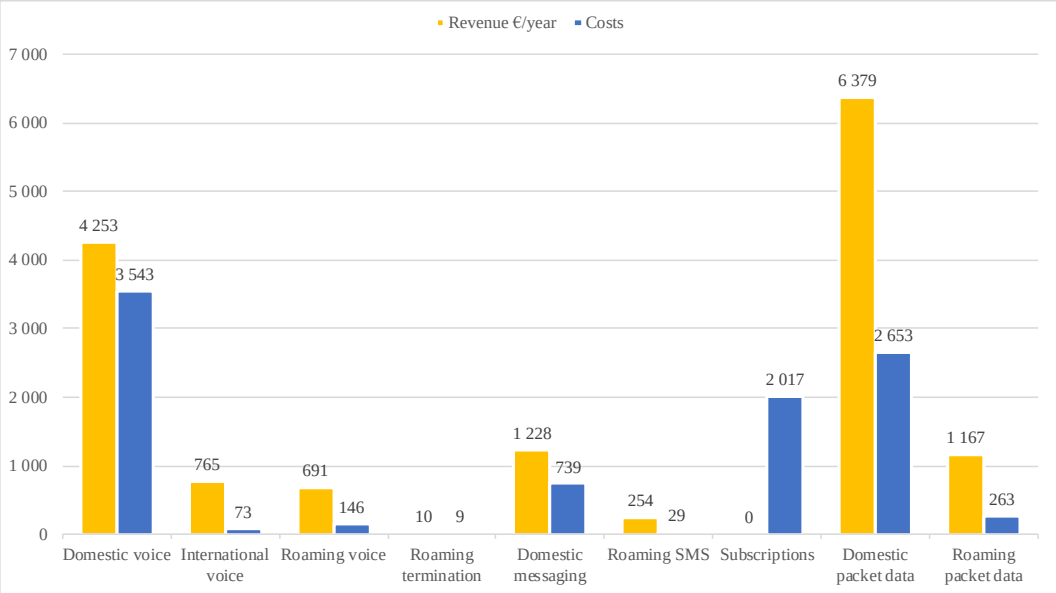
Appendix 2. Cost and Revenue Data of Customer B

Customer B	Revenue €/year	Costs €/year	EBIT €/year	EBIT-%
Mobility Services, Non-data	**74 563**	**45 255**	**29 308**	**39%**
Domestic voice	40 308	13 249	27 059	67%
International voice	12 981	1 450	11 531	89%
Roaming voice	5 971	1 442	4 530	76%
Roaming termination	4 239	1 035	3 204	76%
Domestic messaging	8 783	2 780	6 003	68%
Roaming messaging	1 736	183	1 553	89%
Subscriptions	0	24 746	-24 746	
Mobile center	546	370	175	32%
Mobility Services, Data	**55 957**	**12 686**	**43 271**	**77%**
Domestic packet data	49 140	10 525	38 615	79%
Roaming packet data	6 818	2 161	4 656	68%
Total	**130 521**	**57 941**	**72 579**	**56%**



Appendix 3. Cost and Revenue Data of Customer C

Customer C	Revenue €/year	Costs €/year	EBIT €/year	EBIT-%
Mobility Services, Non-data	**7 241**	**6 577**	**664**	**9%**
Domestic voice	4 253	3 543	711	17%
International voice	765	73	691	90%
Roaming voice	691	146	545	79%
Roaming termination	10	9	1	9%
Domestic messaging	1 228	739	488	40%
Roaming messaging	254	29	225	88%
Subscriptions	0	2 017	-2 017	
Mobile center	0	0	0	
Mobility Services, Data	**7 546**	**2 916**	**4 631**	**61%**
Domestic packet data	6 379	2 653	3 727	58%
Roaming packet data	1 167	263	904	77%
Total	**14 787**	**9 492**	**5 295**	**36%**



Appendix 4. Cost and Revenue Data of Customer D

Customer D	Revenue €/year	Costs €/year	EBIT €/year	EBIT-%
Mobility Services, Non-data	**21 387**	**14 879**	**6 509**	**30%**
Domestic voice	13 184	3 505	9 678	73%
International voice	1 181	11	1 169	99%
Roaming voice	1 360	8	1 352	99%
Roaming termination	32	9	23	72%
Domestic messaging	4 909	1 645	3 264	66%
Roaming messaging	686	5	680	99%
Subscriptions	0	9 648	-9 648	
Mobile center	0	0	0	0%
Mobility Services, Data	**17 669**	**2 069**	**15 600**	**88%**
Domestic packet data	16 469	2 061	14 408	87%
Roaming packet data	1 200	8	1 192	99%
Total	**39 056**	**16 948**	**22 108**	**57%**