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To bill or not to bill?

A comparison of the service components and revenue models of B2B SaaS companies

Master's Thesis

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Software as a Service (SaaS) is widely used in the software industry. The idea is to provide a software as a fully maintained service that is accessible to the users over the internet. The provider maintains, operates, and develops the software, and often provides additional services such as user support and consulting. The customer, in turn, pays recurring fees for using the software.

Operating the software and providing additional services causes significant variable costs. Thus, it is important for SaaS providers to clarify their service offering and to decide how the services are billed. If the service offering and revenue models fulfill different customers' needs, it might also result in additional profits and satisfied customers that get more value of the software.

Regardless of the practical importance of the topic, it seems that the service component offering in SaaS has not been studied, and only few studies have been focusing on SaaS revenue models. In these studies the data has usually been collected through companies' websites or surveys that do not provide much detail and lack the company context. Also, little attention has been paid to the type of SaaS (target customers, software characteristics) even though it has been found to affect the recurring fees.

The aim of this study is to uncover what service components Business-to-Business (B2B) SaaS companies offer, what kind of revenue models they use, and how the service components are included in the revenue models. This study is a multiple case study with 8 companies that are based in Finland or the US and vary in size, customer base, and product characteristics. The primary data source was interviews (N=8). Public and private documentation about the case companies was used as a secondary data source.

This study propose a framework of possible service components and describes in detail the revenue models of 8 B2B SaaS companies. The findings suggest that the service components and revenue models are related to the business criticality and customizability of the software as well as customer size and the heterogeneity of the customer base. Most of the case companies charge their customers a negotiated yearly subscription fee that includes several pricing formulas among them *Fixed fee regardless of volume* and *Tiered pricing*. Additionally, the fee can be partly tied to usage. Most of the companies also bill services by hour or with a fixed project price. However, the overall direction seems to be minimizing additional billing and offering more subscription-based services.

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Software as a Service (SaaS) on laajalti käytetty malli ohjelmistoalalla. Sen perusperiaate on, että ohjelmisto tarjotaan täysin ylläpidettynä palveluna. Palveluntarjoaja siis vastaa ohjelmiston ylläpidosta, toiminnasta ja kehittämisestä sekä tarjoaa usein muita palveluita kuten asiakastukea ja konsultointia. Asiakas vuorostaan maksaa toistuvia käyttömaksuja.

Erilaisten palveluiden tarjoamiseen liittyy huomattavia muuttuvia kustannuksia ja siksi onkin erityisen tärkeää määritellä mitä palveluita tarjotaan ja miten niistä laskutetaan. Järkevästi laskutetut palvelut, jotka vastaavat erilaisten asiakkaiden tarpeisiin, voivat lisätä tuloja sekä parantaa asiakastyytyväisyyttä.

Vaikka SaaSiin liittyvien palveluiden ja ansaintamallin käytännön merkitys on suuri, aiheeseen liittyvä tutkimus näyttää olevan melko rajallista. Yhtäkään tutkimusta SaaS-palvelukomponenteista löytynyt ja myös ansaintamalleihin liittyvä tutkimus on usein toteutettu analysoimalla yritysten verkkosivuja tai kyselyin. Nämä eivät menetelminä tarjoa tarkkaa tietoa tai kokonaiskuvaa yrityksestä. Lisäksi tutkimuksissa on kiinnitetty hyvin vähän huomiota SaaS-tyyppiin (asiakaskunta, ohjelmistojen ominaisuudet), vaikka tämän on huomattu vaikuttavan myös käyttömaksuihin.

Tämän tutkimuksen tarkoitus on selvittää mitä palvelukomponentteja Business-to-Business (B2B) SaaS -yritykset tarjoavat, millaisia ansaintamalleja ne käyttävät ja miten palvelukomponentit liittyvät yritysten ansaintamalleihin. Tutkimus tehtiin tapaustutkimuksena ja mukana olevat kahdeksan yritystä olivat joko Suomesta tai Yhdysvalloista, ja erosivat toisistaan koon, asiakaskunnan sekä tuotteen ominaisuuksien perusteella. Jokaista yritystä haastateltiin (N=8) ja lisäksi käytettiin yrityksistä saatavilla olevaa julkista ja yksityistä materiaalia.

Tämä työ tarjoaa viitekehyksen mahdollisista B2B SaaS -palvelukomponenteista ja kuvaa tarkasti 8 yrityksen ansaintamallit. Tulosten perusteella vaikuttaa siltä, että sekä palvelukomponentit että ansaintamallit liittyvät tuotteen liiketoimintakriittisyyteen ja räätälöintimahdollisuuksiin sekä asiakkaiden kokoon ja asiakaskunnan moninaisuuteen. Suurin osa tutkituista yrityksistä perii kunkin asiakkaan kanssa neuvoteltuja vuosittaisia käyttömaksuja. Maksu sisältää useampia hinnoittelumalleja ja saattaa olla myös osittain käyttöön sidottu. Useimmat yritykset laskuttavat palveluita myös tuntityönä tai kiinteähintaisina projekteina. Yleinen suunta näyttää kuitenkin olevan ylimääräisen laskutuksen vähentäminen ja yhä useamman palvelun sisällyttäminen käyttömaksuun.

Asiasanat:	Business-to-Business (B2B) SaaS, Software as a Service (SaaS), ansaintamalli, tulovirrat, palvelukomponentti
Kieli:	Englanti

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When I first started to write this thesis, I bet I would get it done in a few months. Well, that's not how it works, and in the end, the "few months" turned out to be the standard half a year.

The beginning of the thesis journey was quite a mess. Even though I'm grateful to my employer for the trust and freedom I got when choosing my topic, I ended up spending nearly two months in exploring different areas and switching between various preliminary ideas. Back then that felt frustrating and like a complete waste of valuable time, but now I see it as a central part of the process. That part enabled me to find a topic that really deserves the depth of exploration and is useful for both my employer (and other SaaS companies) as well as the research community.

Moreover, this final topic suits me, because it combines several areas of expertise in a very interesting way. The broad thesis topic even fits my mixed studies in Information Networks surprisingly well. Like some say, studying Information Networks means studying everything and nothing at the same time. The technical aspects of my studies are incorporated in SaaS and the Information Systems research field, the business aspects in the revenue models, and the human aspects in the service components that meet the different customers' needs.

Now when the thesis is finished, I want to thank everyone who was involved in the process of making it. I'm especially grateful to:

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Chapter 1

Introduction

SaaS (Software as a Service) is a widely used technical delivery and business model in the software industry. At a high level, the idea is very simple - the customer buys the software as a fully maintained service that is accessible to them over the internet and pays recurring fees for using it. However, there are many variations of SaaS that can, for example, differ significantly in the services offered and how they are billed.

Traditionally, SaaS has been often referring to standard software offered to individual consumers (B2C), but nowadays SaaS is also one of the key trends in complex business applications. As opposed to B2C SaaS, business-to-business (B2B) SaaS is often critical for the customers' business processes and offers some possibilities for customization or configurations. Thus, B2B SaaS companies also need to provide their customers more services than just the hosting, maintenance, and development of a standard software product.

Providing additional services involves humans or requires more capacity, both of which pose significant variable costs on the software provider. Thus, it is important for the SaaS providers to, first, clarify what services they are actually offering and, second, to make sure that an informed decision is made about how the services are billed. Through a comprehensive service offering and a well-thought revenue model, the service providers can better respond to different customers' needs. This, in turn, can result in increased profitability and satisfied customers getting more value of the software, which also enables the company to be successful in the long run.

However, defining what services are actually offered, finding out how the service offering could be improved, and coming up with a good revenue model to include the services in, are all extremely hard tasks without any industry benchmarks. Then again, benchmarking is often impossible, because this kind of information can be regarded confidential and is not publicly available. Finding this information from academic literature is similarly challenging. It seems that the service component offering in SaaS has not been studied and the few studies that are related to SaaS revenue models, discuss the revenue models only at a very high level. Additionally, most of the studies related to revenue models do not pay attention to the type of SaaS (like B2C or B2B or software characteristics) even though it inevitably influences, among other things, the service offering and the fees.

The aim of this thesis is to find out what service components can be offered in B2B SaaS and what kind of revenue models are applied to them. These can help SaaS companies to clarify their current service offering, productize new services, and rethink their revenue models with interesting benchmarks from other companies. From a theoretical point of view, this study can shed light on an under-researched topic with high practical importance.

This study was conducted as a multiple case study with eight B2B SaaS companies. The studied companies vary in size (turnover from 10 MEUR to 7300 MEUR and employee count from 70 to 30 000), primary customer base (customer size, heterogeneity), and product characteristics (business criticality, customizability).

Next, the background and motivation of this study are described in more detail. After that the research questions and scope of the study are introduced and, in the end of this chapter, the structure of the thesis is presented as a whole.

1.1 Background and motivation

The basic idea of "renting" software instead of owning it has been around already since the 1990s. Back then the idea did not really gain ground (Weinhardt et al. 2009), but after rapid advancements in internet technologies it became one of the key trends in the software industry (Buxmann, Diefenbach, and Hess 2012). According to Weinhardt et al. (2009), with the increasing popularity of cloud solutions also the adoption of the SaaS model will increase.

In contrast to the traditional software licensing model the SaaS fee normally also covers service and maintenance as well as hosting (Lehmann and Buxmann 2009; Cusumano 2007). Hence, as opposed to the traditional licensing model with one-time purchase, the continuous service of SaaS causes significant variable costs on the software provider (Lehmann and Buxmann 2009). This makes both the service component offering and revenue model selection even more important in SaaS than with traditional licences. However, combining them is not easy and cloud service providers face many challenges around pricing (Laatikainen, Ojala, and Mazhelis 2013).

Even though SaaS has already been around for a while and is still one of the key trends in the software industry, surprisingly little research about the service offering or revenue models of SaaS can be found. First of all, the services offered with SaaS are often just casually mentioned without paying any attention to the whole service offering (see for example Cusumano 2007; Ma 2007; Tyrväinen and Selin 2011; Luoma, Rönkkö, and Tyrväinen 2012). This absence of a detailed definition of what is included in SaaS from a service components' point of view is unexpected, knowing that there are studies that have focused on SaaS revenue models or pricing. However, the research related to SaaS pricing and revenue models seems to be very limited. The lack of research has been noted by several authors and, for example, Laatikainen (2018) claimed that before their study no systematic pricing frameworks had

been proposed for cloud services. Dempsey and Kelliher (2018), on the other hand, stated that regardless of their importance, the revenue models and pricing strategies of SaaS providers have received little attention. These two examples also demonstrate well the mixed terminology that without detailed definitions makes comparing the limited studies impossible.

Another problem is that the studies that claim to study revenue models or can be regarded as being related to the revenue models, seem to usually be at very high level of abstraction. For example, many of the studies have only been discussing the fixed and usage-based SaaS fees (see for example Weinhardt et al. 2009; Buxmann, Diefenbach, and Hess 2012; Laatikainen and Luoma 2014). As another example, the SaaS revenue models presented by Dempsey and Kelliher (2018) include advertising, cost-based, subscription, and usage-based. Li et al. (2017), on the other hand, noted that there is a general lack of research on the subscription pricing model that is more common in B2B SaaS. However, Li et al. (2017) represent a prominent stream of SaaS revenue model literature that focuses on optimal SaaS pricing with the help of mathematical models instead of describing the revenue models in more detail.

Like Li et al. (2017) pointed out, the high-level revenue models can vary between B2B and B2C SaaS. However, in current studies related to revenue models, very little attention has been paid to the SaaS type, even though significant differences have been recognized between both B2C and B2B SaaS and more detailed software characteristics (Chong and Carraro 2006; Luoma, Rönkkö, and Tyrväinen 2012). Sometimes, a distinction between B2C and B2B SaaS is made, but none of the found studies seem to consider the possible differences between the SaaS solutions in more detail. One reason might be that many of the few empirical studies relied on pricing information available online (see for example Buxmann, Diefenbach, and Hess 2012; Lehmann et al. 2012; Laatikainen, Ojala, and Mazhelis 2013) that provides very limited information about the company context. Buxmann, Diefenbach,

and Hess (2012), Lehmann et al. (2012), and Laatikainen, Ojala, and Mazhelis (2013) also noted that this data collection method shifts the focus towards smaller companies. Additionally, Lehmann et al. (2012) noticed differences in the availability of the information between different product categories. For example, SaaS companies offering Supply Chain Management/Vendor Management solutions rarely communicated pricing information on their websites. Thus, the revenue models of larger companies operating in certain business areas may not have been revealed yet.

1.2 Research questions and scope

This study focuses on B2B SaaS. Only B2B SaaS was selected, because B2C and B2B SaaS can differ from each other in many aspects (Chong and Carraro 2006; Benlian, Hess, and Buxmann 2009; Luoma, Rönkkö, and Tyrväinen 2012). Thus, the service component offering and revenue models might not be comparable between the two different types of SaaS. More specifically B2B SaaS was selected because it tends to be more customizable and critical for the users than B2C SaaS (Chong and Carraro 2006). Thus, it is possible that also the service component offering is wider and revenue models are more complex in B2B SaaS. These, in turn, can provide a more comprehensive overview of a quite under-researched topic. Even though only B2B SaaS was selected, contrasting results that allow for comparison between the cases can be found. The reason for this is that different types of B2B SaaS have been identified based on the business criticality and complexity or customizability of the software product (Benlian, Hess, and Buxmann 2009; Luoma, Rönkkö, and Tyrväinen 2012).

Only the business side of SaaS is in the scope of this thesis and the detailed technical aspects are not considered. Additionally, even though separate implementation projects might be needed in B2B SaaS (Luoma, Rönkkö, and Tyrväinen 2012), they are not in the scope of this thesis.

The scope of this thesis is formulated into three research questions that are presented below.

>   **RQ1:** What service components can be offered with B2B SaaS and how does the service component offering differ between different kinds of companies?

>   **RQ2:** What kind of revenue models do B2B SaaS companies use?

>   **RQ3:** How can the service components be included in the revenue models of the B2B SaaS companies?

The first research question (RQ1) addresses the service component offering of B2B SaaS companies. Because no previous research has been found about this specific topic, this research question includes defining both what service components can be offered as part of SaaS as well as how the service component offering differs in the studied B2B SaaS companies. The differences in the service component offerings are evaluated based on two perspectives: which service components do the companies offer and how exclusively are the service components offered to the customers. Possible explanations for the differences between the case companies are given based on company size, customer base, and the type of the SaaS product. The exact definition of service component is presented in Section 2.3 and the different SaaS types are discussed in Section 2.1.2.

While RQ1 focuses on the service components, RQ2 and RQ3 aim to find out how their potential variable costs are covered with the revenue models. RQ2 gives an overview of the revenue models of the case companies both by describing the high-level characteristics of the revenue models and the more detailed revenue model elements that actually form the fees. The high-level revenue model characteristics are the length of the subscription, the formula of the different fees, and the customers' influence on the price. The more detailed revenue model elements, in turn, include product and service bundles

that are offered at different prices, and the individual price metrics that partly determine the price. Even though pricing is closely related to revenue models, the actual price and how it is calculated are not in the scope of this thesis. The definition of revenue model and more detailed discussion about the different terms related to it can be found in Section 2.2.1.

RQ3 combines RQ1 and RQ2 and describes how each individual service component is included in the revenue models of the B2B SaaS companies. RQ3 is not analyzed at the same level of detail as the individual revenue models, because the revenue models can be very different from each other and, thus, not directly comparable. Hence, how the service components are included in the revenue models are compared by only showing how they affect the overall fees.

1.3 Structure of the study

This thesis is divided into six chapters. This chapter (Chapter 1) covers the background and motivation, the research questions, and the scope of this study. The next chapter lays the theoretical foundation of this study (Chapter 2) and is divided into three parts. The first part includes the definition for the term SaaS and a presentation of the different types of SaaS. The second part contains a definition of revenue model and other related terms, the high-level characteristics of revenue models, and the more detailed revenue model elements identified from the literature, and a review of what is actually known about the revenue models in the context of SaaS. The last part of the literature review focuses on service components and provides a preliminary list of service components based on existing SaaS literature and more general ITIL best practices for IT service operation (Steinberg 2011).

After providing a comprehensive background for the empirical study, the materials and methods of this study are presented in Chapter 3. This chapter is also divided into three parts. First, the research approach including the case study methodology and the research paradigm are presented. Second, the data collection including, selection criteria for the case companies, preparation for the interviews, and the interview methodology, structure, and the informants are discussed. Finally, the inductive data analysis is described.

After materials and methods, the eight case companies are presented (Chapter 4). These case descriptions include details about the company, its customer base, and its software products, and should help in understanding the results that are presented in the following chapter (Chapter 5). As opposed to the traditional way of first presenting the findings case by case and then with the help of a cross-case analysis, the results of this study are presented primarily by the three research questions. The reason for this is that in contrast to many case studies, the research questions of this study are not connected to a single overarching research problem. Instead, the research questions of this study address individual issues and as such are better understood when presented individually. RQ1 and RQ3 can be answered with the help of service component tables that at the same time show the individual companies' offering and enable comparison between the companies. RQ2, in turn, requires that the somewhat complex revenue models are first presented individually and thereafter compared. Thus, the traditional approach is followed when answering RQ2.

In the last chapter of this study (Chapter 6), the results are discussed and conclusions are drawn. In addition, theoretical and practical implications are provided. Finally, the study is evaluated, limitations elaborated and directions for future research provided.

Chapter 2

Theoretical background

This chapter contains a summary of academic literature that is relevant for this thesis. First, the key concept *Software as a Service (SaaS)* is discussed and the different types of SaaS are introduced. Second, another key concept *Revenue model*, is defined, other related revenue- and pricing-related terms are discussed, a theoretical SaaS revenue model framework is built, and the existing SaaS revenue model literature is reviewed with the help of the framework. Finally, the third key concept *Service component* is defined and a preliminary list of possible SaaS service components is developed.

2.1   Software as a Service (SaaS)

In this section SaaS is viewed both from the technical and business perspectives. Moreover, other related terms like Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) as well as public and private clouds are introduced. After defining SaaS the different SaaS types are discussed. The types of SaaS are based on different customer segments and application characteristics.

2.1.1 On the definition of SaaS

Software as a Service (SaaS) originates from the 1990's concept *Application Service Provider (ASP)* that encompasses very similar business and pricing models for software acquisition (Weinhardt et al. 2009). However, in contrast to SaaS, ASP never got very popular (Weinhardt et al. 2009) at least partly due to the technical complexity of the solution and the high upfront investments required at the time (Buxmann, Diefenbach, and Hess 2012). With advancements in internet technologies and cloud computing in general, switching to SaaS became quite simple and cost-effective (Buxmann, Diefenbach, and Hess 2012). This resulted in the rapidly growing popularity of SaaS (Weinhardt et al. 2009).

Like for many other new IT concepts and solutions, there are multiple definitions available for SaaS (Buxmann, Diefenbach, and Hess 2012). A case in point is that SaaS is referred to, among others, as a business model (Ma 2007; Buxmann, Diefenbach, and Hess 2012), a licencing model (Choudhary 2007), a cloud service model (Mell and Grance 2011), and a cloud business model (Weinhardt et al. 2009). According to Laatikainen and Luoma (2014), the term SaaS has covered in the academic literature both technical delivery and business models of software companies. A similar approach is taken by Kittlaus and Clough (2009), who define SaaS as a business and delivery model.

The SaaS definitions that include technical delivery have traditionally focused on the cloud computing nature of the software, meaning that it is multi-tenant, virtual, web-based and configurable application that is accessible to the users over the internet (Laatikainen and Luoma 2014). This is also quite similar to how the *National Institute for Standards and Technology (NIST)* (Mell and Grance 2011) defines the technical side of SaaS. According to NIST (Mell and Grance 2011) SaaS is is an application running on a cloud infrastructure that is accessible through a thin client interface like a web

browser or a program interface. *Cloud infrastructure* is defined as a *"collection of hardware and software that enables the five essential characteristics of cloud computing"* (Mell and Grance 2011, p. 2). The five essential characteristics are On-demand self-service, Broad network access, Resource pooling, Rapid elasticity, and Measured service. *Cloud computing*, in turn, is defined as *"a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction"* (Mell and Grance 2011, p. 2).

Even though the technical descriptions of SaaS presented above focus on multi-tenancy, SaaS can also be offered with a single-tenant architecture (Chong and Carraro 2006; Kittlaus and Clough 2009; Krebs, Momm, and Kounev 2012). In a single-tenant architecture, the software instance is duplicated for each individual client (Marston et al. 2011) and in a multi-tenant architecture one runtime instance of the application is used by several tenants (Krebs, Momm, and Kounev 2012). In this context, a tenant is defined as *"the users of one customer represent a closed group, which is usually charged and handled as a single entity"* (Krebs, Momm, and Kounev 2012, p. 1). Multi-tenancy can be seen as a common technical direction of the SaaS providers, because it normally reduces the total costs of ownership (Krebs, Momm, and Kounev 2012), enables economies of scale (Chong and Carraro 2006), and allows for better resource utilization (Marston et al. 2011).

From a business perspective, SaaS is often subscription- and/or usage-based in contrast to the traditional way of licensing software (Laatikainen and Luoma 2014). However, also collecting revenues through advertisements is possible in SaaS (Buxmann, Diefenbach, and Hess 2012). It is notable that in SaaS the ownership and the use of software are separated and the software is provided and consumed as a service and not as a product (Laatikainen and Luoma 2014). Like Buxmann, Diefenbach, and Hess (2012, p. 169) puts it *"users*

pay fees for the right to use software components and services". Because the ownership of the software is not transferred, the providing company is responsible for maintaining, developing, deploying, and operating the software (Laatikainen and Luoma 2014; Buxmann, Diefenbach, and Hess 2012). In addition to these, software upgrades are also included in the subscription fee (Choudhary 2007). As formulated in the NIST definition of SaaS (Mell and Grance 2011, p. 2) *"the consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user specific application configuration settings"*. Apart from some customer-specific configuration, SaaS software should be more standardized than traditional software and only limited functionalities provided to a bigger group of customers (Benlian and Hess 2011, cited in Laatikainen and Luoma 2014).

Other relevant terms related to SaaS are *Infrastructure as a Service (IaaS)* and *Platform as a Service (PaaS)*. A common view is that these three concepts are the different layers of cloud services and are based on each other (Buxmann, Diefenbach, and Hess 2012; Weinhardt et al. 2009). IaaS includes computing power, storage, and networks and is the technical basis of other cloud services (Buxmann, Diefenbach, and Hess 2012). PaaS, on the other hand, is a marketplace or development/hosting platform that software providers can build and offer their applications on (Buxmann, Diefenbach, and Hess 2012). SaaS is the application layer above the platform and infrastructure layers that are opaque for the users (Weinhardt et al. 2009). However, low-level IaaS and higher level PaaS have been lacking widely accepted definitions, and some authors consider them being more alike than different (Armbrust et al. 2010).

Another general classification of cloud services is public and private clouds. *Public clouds* are shared by several customers, while *Private clouds* are only restricted to a particular company or provider (Buxmann, Diefenbach, and

Hess 2012). These can also be used together as a *Hybrid cloud.* However, all of these are related to the technical delivery of cloud services and thus, are regarded as out of the scope of this thesis.

In this thesis, SaaS is defines as a *technical delivery and business model of software, where the software is consumed as a service without transferring the ownership of it.* Because this study does not focus on the technical delivery, both single- and multi-tenant architectures are considered as SaaS. Moreover, SaaS software can be running on public or private cloud as long as the SaaS provider is responsible for maintaining and developing it.

2.1.2   SaaS types

As discussed above, the definition of SaaS is very broad. Thus, there are different variants of SaaS that might not be comparable with each other. According to Chong and Carraro (2006) two major categories of SaaS can be identified: *Line-of-business services* that corresponds to B2B SaaS and *Consumer-oriented services* that correspond to B2C SaaS. The *Line-of-business services* are offered to enterprises and organizations regardless of their size. Chong and Carraro (2006, p. 2) state that business services are normally *"large, customizable business solutions aimed at facilitating business processes such as finances, supply-chain management, and customer relations"*, and often sold to the customers on a subscription-basis. The *Consumer-oriented services*, in turn, are offered to the general public and sold sometimes on a subscription-basis, but also frequently provided for free due to advertising.

Benlian, Hess, and Buxmann (2009) and Luoma, Rönkkö, and Tyrväinen (2012) divide B2B SaaS further into two categories that differ by the characteristics of the application. Benlian, Hess, and Buxmann (2009) found contrasting results in SaaS adoption between highly standardized applications with low strategic significance, and applications with higher specificity

and strategic significance. Luoma, Rönkkö, and Tyrväinen (2012), on the other hand, refer to very similar categories of SaaS as *Pure-play SaaS* and *Enterprise SaaS*.

Pure-play SaaS refers to a non-customized software that can be delivered without the need to instruct the users or integrate it. This enables a small entry fee and a lower recurring fee that appeals to the SME customer segment. Pure-play SaaS is also often marketed, sold, and delivered online with a low-touch customer relationship and the buyers are usually middle managers or end-users. (Luoma, Rönkkö, and Tyrväinen 2012)

Enterprise SaaS is more complex and might support a more comprehensive business process. Thus, enterprise SaaS requires supporting services like training and integration that might even include customer-specific on-site work. Moreover, the marginal costs vary due to the required support, long sales cycles, and personal customer relations. These marginal costs are covered with higher prices and an entry fee, recurring fees and service fees. The customers are normally large enterprises and the buyers are IT managers and top executives. Tailored contracts are normally made with the customers. (Luoma, Rönkkö, and Tyrväinen 2012)

Luoma, Rönkkö, and Tyrväinen (2012) also identified *Self-service SaaS* where the software offering is so simplified and standardized that the customers can find, evaluate, and deploy the software themselves. Due to self-service, the marginal costs are close to zero and the revenue comes from advertisements or small recurring fees. The customers are normally individual consumers, end users, or SMEs. Thus, this category is very close to what Chong and Carraro (2006) call *Consumer-oriented services*.

This thesis focuses on *B2B SaaS* that covers both *Pure-play SaaS* and *Enterprise SaaS*. Because these two archetypes of SaaS differ both in the services attached to them and the related revenue models, their characteristics need to be somehow differentiated in the analysis. If the software has a high

strategic importance for the customers' operations, it is referred to as *business critical*. On the other hand, the specificity of the software is described with the *configuration* and *customization* opportunities. If, for example, integrations to other systems are separately built, these are referred to as customization. Instead, if integrations are enabled through a standard interface, this is referred to only as configuration.

2.2   Revenue models

This section contains both the theoretical background of revenue models and summarizes the current body of knowledge about revenue models in the SaaS context. Even though the term revenue model and other related terms like revenue logic, pricing model, and revenue stream are mainly discussed based on the SaaS literature, the revenue model definition by Sainio and Marjakoski (2009) that is not directly related to SaaS is used in thesis. The reason for this is that no comprehensive enough definition for the key concept could be found from the SaaS literature.

After defining the term revenue model and discussing the other related concepts, a theoretical framework for SaaS revenue models is built. The SaaS revenue model framework used in this thesis is formed by combining the different aspects of the pricing models by Laatikainen, Ojala, and Mazhelis (2013) and Lehmann and Buxmann (2009). The SaaS revenue model framework, including different options for revenue model characteristics and elements, is later used for reviewing the revenue model related SaaS literature. The framework is also used in the empirical part of this study.

The SaaS revenue model literature used in this thesis was mainly searched through Google Scholar by using all kinds of combinations of the words revenue model, revenue logic, revenue stream, revenue source, revenue, business model, pricing model, pricing, price structure, pricing scheme, and pricing strategy.

To limit the results to SaaS these aforementioned words were combined with SaaS, Software as a Service, cloud service, cloud solution, and cloud computing. The problem with finding relevant literature was that the terminology seemed to be very mixed and many articles that seemed to be related to the studied phenomenon, turned out to be focusing on completely different things. For example, many SaaS revenue model and pricing model related articles focused on either on optimal model selection or the market behaviour with the help of mathematical modelling. In these studies, almost without exception, the studied "revenue models" were fixed subscription fee and pay-per-use fees. Due to the fact that the actually related studies seemed to be very limited, forward and backward search was used with all relevant articles. This helped to bring up articles that did not appear in the original searches. Additionally, the books related to the business side of SaaS found from the Aalto University library database were reviewed.

2.2.1   On the definition of revenue model

The academic literature seems to be lacking a common definition for the term revenue model and it seems to be used very often synonymously with the term revenue logic. According to Ojala (2013) revenue logic, revenue model, earning logic, earning model, licensing model, and even business model can be used as synonyms. Saarikallio and Tyrväinen (2014) add to this list the terms revenue stream, sources of revenue, revenue mechanism, and income model that are all used in the business model context.

In SaaS context, the term revenue model is often used, but usually not properly defined. Laatikainen (2018) defines revenue logic and revenue model as synonyms that describe how a company captures value and the structure of revenues that are created by serving the company's customers. Dempsey and Kelliher (2018, p. 46), on the other hand, call the company's revenue model a description of the *"revenue flow or stream from its products and services"* and

a *"catalyst through which an organisation builds a pricing strategy to deliver services with high margins and offer future funding for the business"*. Also these definitions are quite mixed both by their terminology and content.

One of the few very detailed definitions of revenue model seems to be by Sainio and Marjakoski (2009). This is why their definition is used in this thesis, even though it is no directly related to SaaS. According to them revenue model and revenue logic are very different concepts that together form a big picture of a company's revenues. According to Sainio and Marjakoski (2009, p. 369) *"revenue logic is the part of the business model that contains a strategic description of revenue sources and how the business generates profits"* and *"revenue model is the operational description of the basis on which revenue is collected from customers or partners"*. As an example for revenue logic Sainio and Marjakoski (2009, p. 369) give *"company x uses value-based licensing for market growth and service billing to create long-term loyal customers"* and for revenue model *"for company x, licensing agreements are per-user-based, whereas service agreements have both a fixed annual fee and hourly-based billing for hours exceeding the contract"*. Sainio and Marjakoski (2009) also consider pricing strategy and earnings logic to be synonyms to revenue model, because they all relate to the practical execution of the revenue logic. Business model, on the other hand, is a higher level concept that includes both the strategic-level idea of revenue logic and its operational-level description that corresponds to revenue model. (Sainio and Marjakoski 2009)

Other terms that seem to often come up in relation to revenue logic and revenue model in the context of software are revenue streams and pricing model. For example, Cusumano (2007) and Laatikainen and Luoma (2014) describe the revenues of the software companies by different revenue streams and Lehmann and Buxmann (2009) and Laatikainen, Ojala, and Mazhelis (2013) discuss pricing models instead of revenue models. Because revenue model can be defined as the operational level description of how the revenues are collected from the customers, the different revenue streams can be seen as

part of the revenue model. Pricing model, in turn, is seen as a slightly different term than revenue model. Even though Laatikainen (2018, p. 20) defines pricing model as *"an operational description of how revenues are collected"* that corresponds to the definition of revenue model by Sainio and Marjakoski (2009), pricing related aspects (like price determination and dynamic pricing strategy) also seem to be included in the pricing models. These pricing related aspects can also be seen as the strategic level of a company's revenues that is part of the revenue logic.

One more concept that is very close to revenue model is price structure. According to Kittlaus and Clough (2009, p. 127) price structure is *"the manner in which the prices for a given software product are offered, including the metric by which those price may vary for the single product (e.g. one single price, price based on number of users, on capacity, on usage, or on volume and licences acquired)"*. This term seems to be somewhat close to the pricing model of Lehmann and Buxmann (2009). However, because the terminology seems to be very mixed and often used very differently, all the other terms than revenue model are avoided in this thesis. The revenue model is defined as Sainio and Marjakoski (2009) and considered to include the description of how the revenues are collected both in terms of the high-level characteristics of the revenue model and the more detailed revenue model elements that form the different fees.

In addition to describing the revenue model characteristics and elements, what is actually included in the different revenue model elements is covered in this thesis. According to Sainio and Marjakoski (2009, p. 369) the term revenue logic can cover in the academic literature *"who pays, what is paid for, and what is included in the price"*. Hence, describing how the service components are included in the revenue models, would be part of the revenue logic instead of the revenue model. However, because the other strategic aspects of revenue logic are not in the scope of this thesis, the term revenue logic is not referred to in this context.

2.2.2 Theoretical foundation of SaaS revenue models

The theoretical foundation of SaaS revenue models is built in this thesis by combining different aspects of the *Cloud services pricing model* by Laatikainen, Ojala, and Mazhelis (2013) and the *Software pricing parameters* by Lehmann and Buxmann (2009). The Cloud services pricing model is mainly based on a general *SBIFT taxonomy of pricing models (Scope, Base, Influence, Formula, Temporal rights)* by Iveroth et al. (2013). Laatikainen, Ojala, and Mazhelis (2013) modified the SBIFT model by combining it with the software-specific pricing parameters by Lehmann and Buxmann (2009) and an empirical study of 73 cloud services (IaaS, PaaS, SaaS) including 34 SaaS solutions. However, not all aspects of the software pricing parameters were incorporated and, thus, Lehmann and Buxmann (2009) is used separately in this study.

The reason for choosing the above mentioned pricing models the foundation of the theoretical framework is that the studies discussing SaaS revenue models on a more general level often describe the revenue models only by the different kinds of fees (like fixed subscription fee or pay-per-use fee) without going into more detail on how these individual fees are formed or if they could be combined into more complex fees. The few studies that describe the SaaS revenue models in more detail, then again, depict only the revenue models of individual companies without generalizing the findings into more comprehensive frameworks. The pricing models can be used as a basis, because they describe both the higher level characteristics of the revenue models as well as the lower level elements that form the fees. The pricing related aspects of the models (like price determination and dynamic pricing strategies) are not taken into account.

The pricing models of Laatikainen, Ojala, and Mazhelis (2013) and Lehmann and Buxmann (2009) were selected, because they seemed to suit the theoretical needs and they also seemed to be widely accepted. Moreover, in the SaaS context no other options than Laatikainen, Ojala, and Mazhelis

(2013) were found. Laatikainen (2018) claimed that before their pricing model (Laatikainen, Ojala, and Mazhelis (2013)) no systematic pricing frameworks had been proposed for cloud services. Besides, the most recent book about SaaS revenue models by Dempsey and Kelliher (2018) did not mention any other cloud services -specific pricing models.

2.2.2.1   Revenue model characteristics

The high-level characteristics of the revenue models are defined by using three dimensions of the Cloud services pricing model by Laatikainen, Ojala, and Mazhelis (2013). These dimensions are *Influence*, *Formula*, and *Temporal rights* and they are also highlighted in the Figure 1 below. The remaining four dimensions of the model shown with grey color in the figure are either considered as revenue model elements (Scope, Degree of discrimination) or as not being in the scope of this thesis (Base, Dynamic pricing strategy). It is also notable that Laatikainen, Ojala, and Mazhelis (2013) did not find enough data related to *Base* and *Dynamic pricing strategy* in their empirical study and (Laatikainen and Luoma 2014, p. 249) later excluded them in another empirical study *"due to their long-term, strategic nature"* and instead concentrated on different operative aspects on pricing models. This is also the approach used in this study.

The *Influence* dimension of the pricing model is identical to the original Influence dimension by Iveroth et al. (2013) and, thus, this dimension is explained using the original study. According to Iveroth et al. (2013), the Influence dimension shows the extent to which the seller or the buyer can influence the price. Thus, it is often connected to the market situation and the negotiation power of the seller and buyer. In *Pricelist* the seller decides the price and communicates it to the buyers with a pricelist. If the power balance between the seller and buyer is more even, the price is set through a *Negotiation*. However, also negotiations often start with a pricelist. In

Result-based price the price is defined by some observable and measurable outcome of the use of the product/service and in *Pay-what-you-want* the pricing decision is made by the buyer. *Auction*, in turn, means setting the price based what other buyers are willing to pay and the seller can only either accept or decline the price. In *Exogenous pricing* the price is determined by circumstance that are not influenced by the seller or the buyer. This kind of circumstances can be, for example, an index that the price is tied to for a certain period of time. (Iveroth et al. 2013)

Scope					
	Pure bundling	Bundling + predefined options		Bundling + freely chosen amount of some items	Unbundling
Base					
	Cost	Competitors' price		Performance-based	Customer value
Influence					
	Pricelist	Negotiation	Result-based price	Pay-what-you-want	Auction	Exogenous pricing
Formula					
	Fixed price regardless of volume	Fixed fee + per unit price	Tiered pricing	Assured purchase volume + per unit price rate	Per unit rate with a ceiling	Per unit price
Temporal rights					
	Perpetual		Subscription		Pay per use
Degree of discrimination					
	No discrimination	3rd degree (person / region)	2nd degree (time- / quantity- / quality-based)	Multi -dimensional discrimination	1st degree
Dynamic pricing strategy					
	Long term real price	Penetration	Hybrid (complementary / premium / free / freemium / discounting)	Skimming

Figure 1: Revenue model characteristics related dimensions of the Cloud services pricing model, modified from (Laatikainen, Ojala, and Mazhelis 2013)

The *Formula* dimension that connects the price to volume is similar to the original dimension by Iveroth et al. (2013) except for the option *Tiered pricing* that was added by Laatikainen, Ojala, and Mazhelis (2013). With the leftmost option, *Fixed price regardless of volume*, the seller has a guaranteed income even if the volume is low, but does not receive any extra from additional volume. According to Iveroth et al. (2013) this in an option for suppliers whose costs do not primarily vary by volume. In *Fixed fee + per unit rate* the

price is formed of a fixed fee and a component that depends on the volume. *Assured purchase volume + per unit rate* means that a certain volume is guaranteed in the contract and paid with a fixed price regardless of whether the volume is used or not. In addition, the buyer pays an extra cost for each unit that exceeds the volume included in the fixed price. In *Per unit rate with a ceiling* the buyer pays a per unit price until a certain level is reached. After that, additional units are not charged. The rightmost option is *Per unit price* and means that the buyer does not need to bear the risks of a low volume, but instead every consumed unit costs. (Iveroth et al. 2013)

The option *Tiered pricing* that Laatikainen, Ojala, and Mazhelis (2013) added means a fixed price with a limitation on the volume or the functionality. Thus, the user has to switch to another tier, if more volume or functionality is needed. According to Laatikainen, Ojala, and Mazhelis (2013, p. 7) this formula is popular in *"IT offerings that apply vertical versioning"*. Versioning, on the other hand, is related to price discrimination that is seen in this thesis as a revenue model element, and introduced in the next Section 2.2.2.2.

The last relevant dimension *Temporal rights* refers to the length of the time period the buyer can use the software (Iveroth et al. 2013). This dimension originally included *Perpetual, Leasing, Rent, Subscription*, and *Pay per use*, but Laatikainen, Ojala, and Mazhelis (2013) removed *Renting* and *Leasing*. According to them, they do not differ from *Subscription* in the cloud solution context. The option *Perpetual* is not considered in this thesis, because Iveroth et al. (2013) define it as the temporal right to use the bought version of the software forever, but without any enhancements made by the seller. This is not in line with the definition of SaaS presented in Section 2.1.1. The two options that are considered in this thesis are *Subscription* and *Pay per use. Subscription* is defined by Iveroth et al. (2013, p. 11) as *"a way of transferring the right to use a product or service for a specified period of time"* so that it includes upgrades and enhancements. In *Pay per use*, the buyer pays for every occasion of using the product or service.

It should be noted that the term Pay per use used on the Temporal rights dimension is often used in SaaS literature for other purposes. According to Laatikainen, Ojala, and Mazhelis (2013) the same term often refers in cloud literature to *Per unit price* of the Formula dimension. For example, Ojala (2013), defines *"pay-per-use"* as billing the customer based on measured software usage. However, also in this case Pay per use can be seen as partly referring to Temporal rights, because there is no obligatory fee that the user would need to commit to (Laatikainen, Ojala, and Mazhelis 2013).

Another terminological pitfall is related to Per unit price of the Formula dimension, because that is sometimes referred to as *Usage-dependent* (see for example Buxmann, Diefenbach, and Hess 2012). However, Lehmann and Buxmann (2009) use the term Usage-dependent with another meaning. Their pricing parameters of are presented in more detail in the next section (Section 2.2.2.2), but they refer to Usage-dependent as price metrics related to measuring actual software usage and usage-independent as price metrics related to a certain usage potential. Due to the terminological inconsistencies presented above, the terms Pay per use and Per unit price are used in thesis the way they are used in the Cloud services pricing model and Usage-dependent and Usage-independent as in the *Software pricing parameters*.

2.2.2.2 Revenue model elements

A revenue model element is regarded in this thesis as an individually identifiable element of the revenue model that is directly related to price formation. Thus, it can be seen that the revenue model elements all have a separate price that affects the overall price. However, pricing strategies or calculating the exact price for individual customers are not part of the revenue model elements.

The revenue model elements are defined with the help of the two remaining dimensions of the Cloud services pricing model by Laatikainen, Ojala, and Mazhelis (2013) (Figure 2) and the relevant categories of the Software pricing parameters by Lehmann and Buxmann (2009) (Figure 3). The two remaining dimensions from the Cloud services pricing model are *Scope* and *Degree of discrimination*. The corresponding pricing parameter categories are *Price bundling* and *Price discrimination*. Additionally, the pricing parameter category *Assessment base* is regarded as closely related to revenue model elements. Assessment base, price discrimination, and price bundling are also regarded by Ojala and Tyrväinen (2012) as the aspects software pricing can be based on.

The *Scope* dimension of the Cloud services pricing model includes options for different types of price bundling. Price bundling means compiling several sub-services (products, service, and/or rights) into a packages that have a total price (Diller 2008, cited in Lehmann and Buxmann 2009) and, thus, bundling can also be seen as a special case of price discrimination (Diller 2008, cited in Lehmann and Buxmann 2009). In the original SBIFT model the only categories within this dimension were *Package* and *Attribute*. Laatikainen, Ojala, and Mazhelis (2013) added two new options of customized bundling and renamed Package as *Pure bundling* and Attribute as *Unbundling*. Pure bundling means that the customer can only choose between predefined product or service bundles and Unbundling that all products or services can be selected freely. The two new bundling options that Laatikainen, Ojala, and Mazhelis (2013) added cover situations where the customer can choose a product or service bundle and in addition to that select additional products or services either from a set of predefined options or freely. The Scope dimension corresponds to the *Offer* pricing parameter where customized bundling is called mixed bundling. Lehmann and Buxmann (2009) also provide other pricing parameters related to bundling, but they either are not relevant for SaaS or not directly related to pricing.
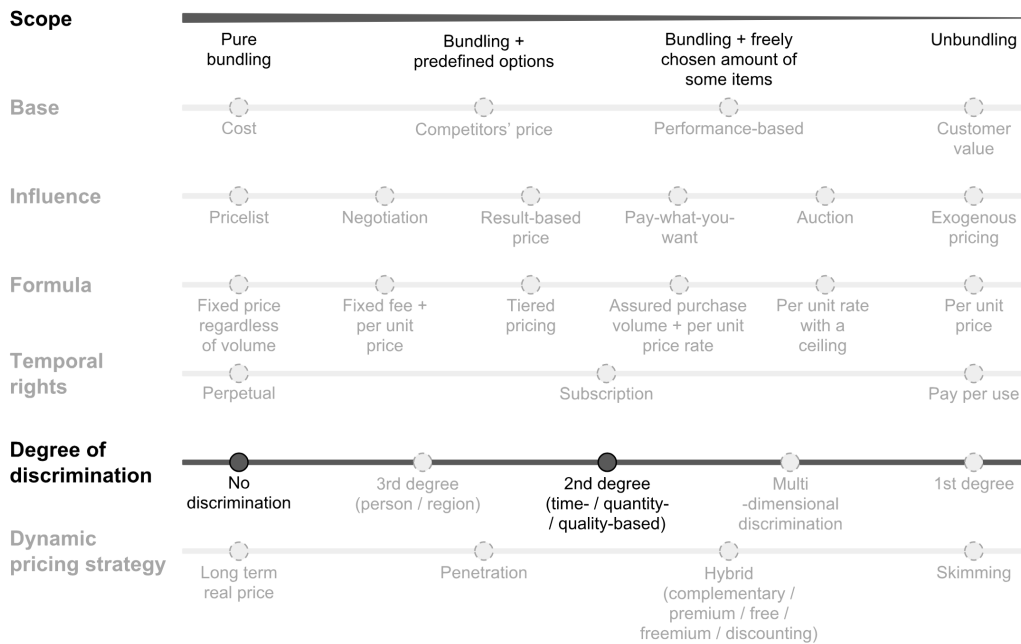
Figure 2: Revenue model elements related dimensions of the Cloud services pricing model, modified from (Laatikainen, Ojala, and Mazhelis 2013)

Figure 3: Revenue model elements related Software pricing parameters, modified from (Lehmann and Buxmann 2009)

The dimension *Degree of discrimination* was added to the Cloud services pricing model based on the pricing parameters of Lehmann and Buxmann (2009) and thus, the two pricing models are identical in this aspect. The basic idea of price discrimination is offering the same product or service to different buyers at different prices (Laatikainen, Ojala, and Mazhelis 2013). There are three different degrees of price discrimination: *1st*, *2nd*, and *3rd* (Pigou 1929, cited in Lehmann and Buxmann 2009). 1st degree discrimination means offering different customers different prices according to their willingness to pay (Pigou 1929, cited in Lehmann and Buxmann 2009). The 2nd degree discrimination refers to the principle of self-selection, meaning that the customer gets to choose a product-price combination (Varian 1997, cited in Lehmann and Buxmann 2009). The *3rd degree* includes personal and regional discrimination (Skiera and Spann 2000, cited in Lehmann and Buxmann 2009) like lower prices for students or licences for private use (Lehmann and Buxmann 2009).

The 1st and 3rd degree of discrimination are left out because they refer to setting different prices for different customers or customer segments. Even though also 2nd degree of discrimination is related to pricing it is regarded relevant for this thesis, because it is also closely related to bundling. According to Lehmann and Buxmann (2009) the basis of 2nd degree discrimination can be quantity, time, and versioning. If the the basis is quantity, the price per unit changes in relation to the quantity purchased. If the basis is time, prices can differ depending on the time of the day, season, or the delay in availability. If the basis is performance, there are differences in prices between product variants or versions.

Assessment base is a central part of the revenue model elements, because it describes the individual price components, also called price metrics (see Lehmann et al. 2012), that are assessed when forming the price (Lehmann and Buxmann 2009). The term price metric is used in this thesis instead of price component, because it is also used by Kittlaus and Clough (2009).

The price metrics can be divided into *usage-dependent* or *usage-independent*, where usage-dependent refers to measuring actual software usage and usage-independent to measuring a certain usage potential (Lehmann et al. 2012). Examples of usage-dependent price metrics are transactions, memory requirements, and time of usage and of usage-independent price metrics named user, concurrent user, server/machine, CPU, master data, locations, produced amount, and key performance indicators (Lehmann and Buxmann 2009).

2.2.2.3 SaaS revenue model framework

To sum up, Figure 4 shows all the different options for the SaaS revenue model characteristics and elements that were identified with the help of Laatikainen, Ojala, and Mazhelis (2013) and Lehmann and Buxmann (2009). This SaaS revenue model framework is used for analyzing the existing SaaS literature and used as a basis for the empirical part of this study. With the help of the framework the terminology used will be consistent and all the revenue models can be analyzed from a similar perspective. The empirical study is designed so that all the different dimensions are covered in data collection and even though the revenue models of the case companies are first analyzed and depicted inductively, this framework is used later to complement the initial models. However, the data collection and analysis are presented in more detail in Chapter 3.

	Options					
Revenue model characteristics — Influence	Pricelist	Negotiation	Result-based price	Pay-what-you-want	Auction	Exogenous pricing
Formula	Fixed price regardless of volume	Fixed fee + per unit price	Tiered pricing	Assured purchase volume + per unit price rate	Per unit rate with a ceiling	Per unit price
Temporal rights	Subscription			Pay per use		
Revenue model elements — Price bundling	Pure bundling		Bundling + predefined options	Bundling + freely chosen amount of some items	Unbundling	
Price discrimination	No discrimination			2nd degree price discrimination		
Assessment base	Usage-dependent price metrics			Usage-independent price metrics		

Figure 4: SaaS revenue model framework

2.2.3   Revenue models in SaaS

The current literature about revenue models in the SaaS context is summarized in this section. First, the literature related to higher level characteristics of revenue models, and then, the literature that relates to the lower level elements of the revenue models is reviewed. It is notable that the literature related to both is very limited.

2.2.3.1   Revenue model characteristics in SaaS

According to Cusumano (2007), software vendors' revenues have traditionally consisted of three streams - an upfront licence fee for the perpetual right to use the specific version of the software, an often annually paid maintenance fee covering patches and updates for the product, and additional services for installation, integration, user training and customization. However, from 1990s to mid-2000s the main sources of revenues have strongly shifted from licence fees to maintenance and other service fees. Additionally, the upfront

licence fees have also been challenged by many subscription based licenses that also include software maintenance. An example of these is SaaS, which also includes hosting in the subscription fee. (Cusumano 2007)

Laatikainen and Luoma (2014) argue that SaaS is often subscription- and/or usage-based. In addition, according to Buxmann, Diefenbach, and Hess (2012), the revenue model of SaaS can also be advertising. Quite similar observations were also made by Luoma, Rönkkö, and Tyrväinen (2012) who studied the business models of 163 Finnish SaaS and ASP companies with a survey. According to them, B2B SaaS companies, including *Enterprise SaaS* and *Pure-play SaaS*, often charge recurring fees. Additionally, Enterprise SaaS companies often have additional service fees due to their varying marginal costs that are caused by the high amount of supporting services provided. Luoma, Rönkkö, and Tyrväinen (2012) also mentioned that the contracts in Enterprise SaaS are normally tailored for each customer. Advertising was also recognized as a revenue source in *Self-service SaaS* (Luoma, Rönkkö, and Tyrväinen 2012). However, Luoma, Rönkkö, and Tyrväinen (2012) noted that the customers of Self-service SaaS are normally individual consumers. Advertising was also mentioned as a revenue source in the category Consumer-oriented services by Chong and Carraro (2006). Thus, it seems that advertising is mainly used in B2C SaaS and the revenue sources of B2B SaaS are recurring fees, and in some cases additional service fees. However, Luoma, Rönkkö, and Tyrväinen (2012) do not go into more detail on what is meant by recurring fees.

Laatikainen and Luoma (2014) argue that recurring fees can be subscription- and/or usage-based in SaaS. Ojala (2013) calls the most common SaaS revenue models software renting and pay-per-use. In short, pay-per-use means billing the customer based on metered software usage and rental that the customer pays a subscription fee for using the software for a certain time period regardless of the usage of the software (Ojala 2013). However, also other terms are used for the same model and, for example, Weinhardt et al. (2009,

p. 397) refer to software rental as Subscription, because *"the user subscribes (signs a contract) for using a pre-selected combination of service units for a fixed price and longer time frame, usually monthly or yearly"*. With the terminology presented in Section 2.2.2.1, software rental and subscription would refer to the temporal right *Subscription* that is paid with a *Fixed price regardless of volume*, and Pay-per-use, on the other hand, to the temporal right of *Pay per use* combined with a *Per unit price*.

Another very similar term as Pay-per-use used in the literature is pay-as-you-go. Armbrust et al. (2010, p. 53) define Pay-as-you-go as *"metering usage and charging based on actual use, independently of the time period over which the usage occurs"*. However, Pay-as-you-go can also be seen slightly differently from Pay-per-use. As Ma (2007) puts it, in Pay-as-you-go the users do not need to pay any initial setup costs and pay only a price per transaction. In this thesis only the continuous use of the software is studied and thus, the distinction between Pay-per-use and Pay-as-you-go is not central. Additionally, these two terms are not separated in the SaaS revenue model framework presented in Section 2.2.2.3.

The dominance of the two models, Subscription with a Fixed price regardless of volume and Pay per use with a Per unit price, seem to be widely accepted (see for example Weinhardt et al. 2009; Ojala 2013; Laatikainen and Luoma 2014; Li et al. 2017). Weinhardt et al. (2009) reason that the users prefer simple models with a static payment fee. However, when it comes to the most popular model, the opinions conflict. For example, Ma (2007) argues that the SaaS users normally pay a fee per transaction that ties the payments closely to the actual utility obtained. On the contrary, Al-Roomi et al. (2013) state that the SaaS end users are normally charged a flat fee either monthly or yearly. However, it is notable that most of the authors do not make the distinction between B2C and B2B SaaS. Additionally, many authors who make claims about the popularity of a specific revenue model have not conducted any empirical studies on the subject.

The few empirical studies found related to the high-level revenue model characteristics of SaaS have been conducted by Weinhardt et al. (2009), Ojala and Tyrväinen (2012), Buxmann, Diefenbach, and Hess (2012), Laatikainen, Ojala, and Mazhelis (2013), and Laatikainen and Luoma (2014). However, Weinhardt et al. (2009) and Laatikainen, Ojala, and Mazhelis (2013) studied all cloud service providers (IaaS, PaaS, SaaS) instead of only focusing on SaaS, and only Buxmann, Diefenbach, and Hess (2012) explicitly state that the focus was on B2B SaaS. Additionally, Buxmann, Diefenbach, and Hess (2012) and Laatikainen, Ojala, and Mazhelis (2013) studied the pricing models that were available online. Both studies found that pricing information was available mainly for small and medium sized companies. Buxmann, Diefenbach, and Hess (2012) state that most of the studied B2B SaaS providers were small and employing under 51 people, and Laatikainen, Ojala, and Mazhelis (2013) that a majority of the studied cloud service providers (IaaS, PaaS, SaaS) were small and medium sized. Only Ojala and Tyrväinen (2012) studied the revenue models of SaaS companies through a case study with five Finnish, mainly B2B, SaaS providers. However, also these companies seemed to be rather small.

Weinhardt et al. (2009), who compared the pricing models of 18 cloud service providers (SaaS, PaaS, IaaS), came to the conclusion that pay-per-use was most frequently used. However, only 13 of the studied companies were SaaS. Among them 3 offered subscription, 1 both subscription and pay-per-use, and the rest only pay-per-use. Yet, the results of this study are difficult to compare with other empirical studies, because no details about the retrieving the data or the data analysis are given. Also, it seems based on the list of the studied companies, that very few of them were B2B SaaS.

Contrasting results were found by Ojala and Tyrväinen (2012) and Buxmann, Diefenbach, and Hess (2012), who both focused more on B2B SaaS. All the five case companies studied by Ojala and Tyrväinen (2012) were using both software renting and traditional licensing as their primary revenue models.

Pay-per-use was not used, because it was found more complex than software renting due to the need to measure the actual usage and maintain the records separately for each customer (Ojala and Tyrväinen 2012). The benefits of software renting were that it creates a steady revenue stream, is easy to predict and, thus, is a less risky way to cover the development costs (Ojala and Tyrväinen 2012). Buxmann, Diefenbach, and Hess (2012), on the other hand, concluded that a clear majority (144 out of 166 B2B SaaS solutions of US-based companies) applied, what they call usage-independent pricing. 37 solutions were using hybrid of both usage-independent and usage-based pricing and very few only usage-based pricing. Buxmann, Diefenbach, and Hess (2012) concluded that B2B SaaS users most often pay fees for the right to use software components and services monthly, quarterly, or annually.

The only study that made a further division between the pricing formulas was Laatikainen, Ojala, and Mazhelis (2013). The pricing formulas of the studied 34 SaaS solutions were Fixed price regardless of volume (18%), Fixed fee + per unit price (6%), Tiered pricing (48%), Assured purchase volume plus per unit price rate (12%), and Per unit price (15%). However, Laatikainen, Ojala, and Mazhelis (2013) either did not make any distinction between B2C and B2B and covered mainly small or medium sized companies.

The only studies covering the other revenue model characteristics were Ojala and Tyrväinen (2012) and Laatikainen, Ojala, and Mazhelis (2013). Ojala and Tyrväinen (2012) consider the aspect of Temporal rights and state that the the subscription varied from 24 hours to three years among the five case companies. More specifically, the length of the agreement was often negotiated and the aim was to get a maximum duration.

In the study by Laatikainen, Ojala, and Mazhelis (2013), the dimension Temporal rights was most often Subscription (85%) and Pay per use in (15%). Laatikainen and Luoma (2014) also found in another survey-based study that regardless of moving towards usage-based pricing due to changes in cloud computing technologies shorter subscription contracts were not implied,

because the studied Finnish SaaS companies preferred developing longer customer relationships due to the heavy competition in the market and the high initial investments on the product.

The dimension Influence was considered mainly by Ojala and Tyrväinen (2012) and Laatikainen, Ojala, and Mazhelis (2013). Laatikainen, Ojala, and Mazhelis (2013) summarized that Pricelist was used in 79% of the SaaS solutions and a combination of Pricelist and Negotiation in 21%. They also mentioned that pricelists were especially popular in cases where there was a large customer base with similar needs. The results were contrasting in the case study of Ojala and Tyrväinen (2012) covering five mainly B2B SaaS companies. According to them, negotiations were held in most cases separately with each customer. The study by Ojala (2012) that seems to use the same data as Ojala and Tyrväinen (2012), verifies that by stating that all the B2B companies negotiated the agreement always separately with their customers. Also Luoma, Rönkkö, and Tyrväinen (2012) mentioned in their study about SaaS business models that in Enterprise SaaS the sales cycles were long and tailored contracts were made with the customers. Laatikainen and Luoma (2014), on the other hand, linked pricelists to companies offering standard software with a limited set of core functionalities. However, based on their survey with 324 responses they also concluded that the Finnish SaaS companies had been increasing usage-based pricing on the Formula dimension and reducing the customer's influence on the price on the Influence dimension.

To sum up, not many studies about the high-level revenue model characteristics were found. Additionally, the very mixed terminology and the lack of definitions made comparing the few studies very hard. For example, it seems that the results differed very much by the type of SaaS (B2C and B2B). Also different methodological choices seem to result in studying different types of SaaS companies and affected the level of detail in the analysis of the revenue model characteristics. As an example of this, Laatikainen, Ojala, and

Mazhelis (2013) concluded that the available pricing models online were very complex and difficult to understand and compare.

2.2.3.2 Revenue model elements in SaaS

The academic literature related to the more detailed revenue model elements in SaaS seems to be very limited. For example, Laatikainen, Ojala, and Mazhelis (2013) cover only the different options for price bundling and price discrimination, but did not take into account the price metrics that are assessed individually when forming the price. Buxmann, Diefenbach, and Hess (2012), on the other hand, mention some price metrics, but mainly studied the popularity of the higher level concepts of usage-dependent and usage-independent pricing and that did not cover price bundling and price discrimination.

Based on the study by Laatikainen, Ojala, and Mazhelis (2013) that is based on the pricing information available online for 34 SaaS solutions, Pure bundling (85 %) and 2nd degree discrimination (time-/quantity-/quality-based) (87 %) are used in a clear majority of the SaaS solutions. Bundling + predefined options was used in 6 %, Bunding + both predefined options and freely chosen amount of some items in 3 %, Bunding + freely chosen amount of some items in 3%, and Unbundling in 3% of the solutions. No price discrimination was used in 7% and Multi-dimensional discrimination was used in another 7% of the solutions. This seems to be the only study that seems to be related to price bundling and price discrimination in SaaS companies.

Assessment base, including price metrics, seems to be mentioned more often. For example, Lehmann and Buxmann (2009), who studied software pricing models in general, mentioned that SaaS enables many possibilities for assessment base and that usage-independent variables like the number of users are widely used. Also Buxmann, Diefenbach, and Hess (2012), who did not specifically study price metrics, argued that the number of users is

the main price metric in the usage-independent fees that generally dominate in SaaS. The only study that actually described the revenue models of the companies in more detail was Ojala (2012). According to their study, the price metrics used in the five case companies were the number of users, the length of the rental agreement, the functionalities included in the software, the size of the customer, and the elements included in the software, all these price metrics being usage-independent. Ojala (2012) also found that the role of the price metrics was significant, because in most case companies the prices were always sums of different options and often negotiated separately with each customer. Hence, negotiations that affect the content of the agreement can also be seen as a price metric.

2.3 Service components

The term *Service component* is defined in this study *a separately identifiable service that is offered as part of SaaS*. For example, according to Cusumano (2007), maintenance services can include bug patches, product revisions, and technical support. Other possible services are professional services like product customization or training programs for users (Cusumano 2007). All this kind of services that are somehow offered in SaaS can be seen as individual service components. They can be a part of SaaS, priced and offered individually, or included in service bundles that are sold with SaaS.

Academic literature related to SaaS service components was searched through Google Scholar and the Aalto University library search by using different combinations of SaaS and service, service component, service element, service modularity, software maintenance, additional services, service level, customer service and service operation. However, all the search results seemed to be related to the technical implementation of SaaS, Service Level Agreements (SLAs), or service quality. Moreover, the articles focusing on SaaS business models did not seem to differentiate the service components in SaaS.

Due to the lack of research on SaaS service components, academic literature was also searched from other research areas. However, the problem was that various searches on additional software-related services did not provide any useful results. Also the more general service modularity literature seemed to focus more on designing a product or service of separate modules instead of offering additional services that complement another product or service. Also the examples in this field did not seem relevant for the software context.

Because no relevant studies could be found, the term service component cannot be regarded as an established term. The only appearance of the term seems to be in Tyrväinen and Selin (2011) where the term is used in a table that presents a summary of the interview results from different SaaS companies. The services placed under the term service component are self service, deployment service, integration, tailoring, training and consulting. However, Tyrväinen and Selin (2011) does not refer to service components in the text or provide any definition for the term. A slightly similar term appears in Luoma, Rönkkö, and Tyrväinen (2012) where different services related to integration and training are referred to as service elements. However, neither of these or the term service element is defined or discussed in more detail.

The ideas for possible SaaS service components were in the end collected from various SaaS articles that happened to mention individual services that could be considered as service elements. For example, Laatikainen and Luoma (2014) summarized that in SaaS the software firm develops, deploys and operates the software application. Lehmann and Buxmann (2009), on the other hand, stated that the SaaS fees normally include service and maintenance as well as server capacity (Lehmann and Buxmann 2009). Ma (2007, p. 1), in turn, described that *"SaaS vendors offer a bundle of software applications, an IT infrastructure, and all necessary support services"*. However, Ma (2007) also mentioned that IT support services include daily software maintenance, data backups, software upgrades, and security.

However, the problem with the service components in SaaS literature was that the service were often mentioned only on a very high level and the few more detailed components did not provide a comprehensive view of the possible service component offering. To fill out the gaps *ITIL (Information Technology Infrastructure Library) Service Operation* (Steinberg 2011) was used as an additional reference. ITIL is a collection of high-level best practices that are widely used in the IT industry. The best practices are divided into different life-cycle stages of IT services and the stage Service Operation covers the maintenance of IT services. Because SaaS includes maintaining the software, it was considered that ITIL Service Operation could also provide useful service component ideas. The reviewed parts of ITIL Service Operation were *Service operation processes*, *Common service operation activities*, and *Service operation functions*. The preliminary list of service components developed based on the existing SaaS literature and ITIL Service Operation is shown in Table 1. This service component list was developed further in the empirical part of this study.

The first service component category *Maintenance* is mainly based ITIL Service Operation (Steinberg 2011). *Event management*, *Incident management* and *Problem management* were all different Service operation processes of ITIL. They were combined here into one service component, because it seemed that all of them could be done as part of the daily maintenance mentioned by Ma (2007). Server management, Network management, and Application management that belonged to Common IT service operation activities in ITIL, were combined into a service component called *Hosting and infrastructure*, because in SaaS the software provider should cover all the activities related to operating the software (Laatikainen and Luoma 2014). A service component called *Job scheduling* was added based, because in ITIL job scheduling was described as running batch and real-time work with job scheduling software packages (Steinberg 2011), which seemed to relate to software maintenance.

Table 1: Preliminary list of service components

Maintenance
- Event, incident and problem management
- Hosting and infrastructure (server, network, and application management)
- Job scheduling

Development
- Bug patches/product revisions
- Upgrades/versions

Preventive measures and recovery
- Monitoring
- Backup
- Testing service recovery plans
- Restoration

User requests
- Contacting support/help desk (phone call, email, web interface)
- Single user change requests
- Multiple user configuration changes

Professional services
- Additional development and customization
- User education and training
- Consulting

The second service component category, *Development*, originated very much from individual service components mentioned in the academic literature. *Bug patches* and *Product revisions* were mentioned by Cusumano (2007) and *Upgrades* by Ma (2007). These smaller releases and larger product versions were kept as separate service components, because they could be treated separately by the SaaS companies in terms of billing.

All service components in the third service component category, *Preventive measures*, were derived from ITIL and only textitBackups were mentioned in the SaaS literature by Ma (2007). Backup and recovery and Monitoring and control were presented in Common IT service operation activities in ITIL. Backup and recovery were separated in the service components, because it was considered that the recovery of the service could be billed separately, if

it was done on the customer's request or caused by the customer's actions. Recovery was renamed to *Restoration*, because the restoration activities were described in more detail in ITIL. Also Monitoring and control was also named only as *Monitoring*. *Testing service recovery plans* was added as a service component, because it was referred to in IT service continuity management that belonged to the Common service operation activities in ITIL.

The idea with the fourth category was to cover the support function and, thus, the service elements were divided into different kinds of *User requests*. Also this category relied on ITIL Service Operation, because none of the academic articles further divided support into separate activities. The different channels for contacting support were based on the channels mentioned in the ITIL service operation processes. *Single user* and *Multiple user* changes, on the other hand, were derived from the description of the Request fulfillment process presented in ITIL Service Operation. A difference was made between smaller *Single user changes* and larger *Multiple user configuration changes*, because they could be treated differently in the revenue models of the SaaS companies. Access management that was separately mentioned in ITIL was considered as belonging to either Single or Multiple user changes.

The last category, *Professional services*, was mainly based on existing academic literature. Product customization was mentioned by Cusumano (2007), and Tyrväinen and Selin (2011) seemed to refer to it as Tailoring. Integrations mentioned by Tyrväinen and Selin (2011) and Luoma, Rönkkö, and Tyrväinen (2012) were considered as customization and, thus, considered as part of the service component *Additional development and customization*. Configurations mentioned in the NIST definition (Mell and Grance 2011) were seen as part of Multiple user configuration changes. Training programs mentioned by Cusumano (2007) and Training by Tyrväinen and Selin (2011) were combined into *User education and training*. Additionally, *Consulting* was added, because it was mentioned by Tyrväinen and Selin (2011). Security, also mentioned by Tyrväinen and Selin (2011), was not considered a service component.

Chapter 3

Materials and methods

This chapter covers the materials and methods of this empirical study. First, the research approach, in other words, the case study methodology and the motivation behind it, are described. Then, the data collection process is presented by describing the selection criteria for the case companies, the preparation for the interviews, and conducting the interviews. Finally, the inductive approach to data analysis as well as the actual analysis process, are discussed.

3.1   Research approach

This empirical study is conducted as a case study, which, according to Yin (2018), is very suitable for answering *"how"* and *"why"* questions in situations where there is little or no control over behavioral events, both recent past and present are covered, and the studied phenomena cannot be separated from its context. Case study research provides an in-depth focus on the studied phenomena and creates a holistic understanding of the subject (Yin 2018).

In this research, the aim is to give an overview of what kind of service components can be offered with B2B SaaS, describe the revenue models B2B SaaS companies, and understand how the service components are included in the revenue models. The case study methodology is suitable for this

research, because service components and revenue models cannot be studied without taking the company context into account. Moreover, studying both the current situation and the evolution of the revenue models and service components can help to create a better understanding of the topic. The methodological choice is also supported by the fact that case study has been recognized as the most common qualitative method in *Information Systems (IS)* research (Myers and Avison 2002). Additionally, it is well justified, if the research topic is unexplored or there seems to be a lack of viable theory (Eisenhardt and Graebner 2007) as is the case in this research based on the literature review presented in Chapter 2.

Even though Myers and Avison (2002) refer to case study as a qualitative research method, case studies can include both qualitative and quantitative evidence (Yin 2018). Nonetheless, in this study, only qualitative evidence is used. According to Marshall and Rossman (2006), qualitative research is well justified for example when little is known about the subject. Moreover, they argue that the strengths of qualitative research are highlighted in exploratory or descriptive studies where the context, setting, and participants' frames of reference have a central role. In this case, no previous studies have been found about this specific research topic, and the company context is crucial to be able to describe the service elements and revenue models.

The research paradigm of this study is critical realism. IS research has been traditionally dominated by two contrasting research paradigms, positivism and interpretivism (Smith 2006; Wynn Jr and Williams 2012). However, critical realism has recently gained more interest among different social science disciplines (Wynn Jr and Williams 2012) and it has been proposed to solve the underlying problems of the two mainstream research paradigms traditionally applied to IS research (Mingers 2004; Smith 2006).

The philosophical idea of critical realism is that one independent reality exists even though it might not be fully understandable or observable (Wynn Jr and Williams 2012). Critical realist research aims at describing the structure

and mechanisms of the underlying reality so that the observed events can be explained (Bhaskar 1975, cited in Wynn Jr and Williams 2012). This ontological and epistemological approach is suitable for this study, because it can be assumed that both the service components and the revenue models are structures that exist regardless of the observer. Nevertheless, due to the qualitative nature of this study, the topics of interest cannot be examined without taking the humans and their perceptions into account. Wynn Jr and Williams (2012, p. 788) also argue that the case study research methodology might be the most suitable methodology to *"develop causal explanations of complex events"* within the critical realist paradigm.Yin (2018) is used as the basis for the research design of this case study presented next in Section 3.2, because it is oriented towards the realist perspective (Yin 2018).

3.2 Data collection

This study is conducted as a multiple case study consisting of eight individual cases. Multiple case studies are generally considered more robust than single case studies (Yin 2018). The theory developed from multiple cases is *"better grounded, more accurate, and more generalizable (all else being equal)"* when compared to single cases (Eisenhardt and Graebner 2007, p. 27). Additionally, because the number of cases is normally quite small, adding a few cases also results in significantly more analytic power (Eisenhardt and Graebner 2007).

In addition to the many benefits of multiple cases, they are necessary for this study to be able to reveal and describe different SaaS service components and revenue models in various company contexts. Moreover, the number of individual cases of this study is relatively high, because contrasting results were desired. According to Yin (2018), to predict contrasting results (theoretical replication) instead of similar results (literal replication), more cases are normally used.

Within case studies, multiple sources of evidence can and should be used (Yin 2018). The possible sources of evidence are documentation, archival records, interviews, direct observation, participant observation, and physical artefacts (Yin 2018). The data sources used in this thesis were interviews and documentation. Interviews were conducted with all the case companies and are, thus, considered the primary data source of this study. Supporting documentation about the case companies from mainly public sources were used according to their availability.

Out of the possible sources of evidence, archival records, direct observation, participant observation, and physical artefacts were not used. Archival records were not available from the studied companies. Observations were left out due to their labor intensiveness and time restrictions of the research. Physical artefacts were not considered relevant for the study.

Next, the selection of the case companies is presented. After that, the preparation for the interviews in terms of supporting documentation and a pilot interview are introduced. Finally, the actual interviews are described in detail including the interview structure and informants.

3.2.1 Selection of the case companies

The main selection criteria for the case companies was that the company's offering included B2B SaaS. The reason for this was that B2B SaaS can be business critical as well as have customer-specific customizations and configurations that also could make SaaS maintenance more difficult. Thus, service components and revenue models could be more versatile and interesting to study than if the case companies were offering more standardized B2C SaaS.

The B2B SaaS companies for this study were selected based on their accessibility. The researcher was working in one of the case companies and had contacts to two other companies that fulfilled the main selection criteria. The rest of the potential case companies were first contacted by the researcher's colleagues who had contacts to them. In total ten companies were contacted and eight gave a positive response. The eight case companies of this study are presented in Chapter 4.

In addition to the eight case companies, a pilot company that the researcher had contacts to, was involved. The pilot company helped to prepare for the actual case study interviews and to further develop the preliminary service component framework that was later used in the interviews. The pilot company was not offering a SaaS product, but was maintaining several customer-specific applications in a similar way.

3.2.2   Preparing for the interviews

The actual case study interviews were preceded by a pilot interview and gathering background information of the case companies. The background information helped to get an overview of the case company and its products, to better understand the company's context, and to prepare for the interviews. The information gathered beforehand was later validated in the interviews. Additionally, two private documents from the companies were used to further develop the preliminary service component framework presented in Section 2.3. The updated service component framework was later used in the interviews.

3.2.2.1   Supporting documentation

The documentation used in this study is presented in Table 2. Most of the background information was from public company websites. In addition, basic information about the sizes and financials of the six Finnish companies was gathered from the public *Asiakastieto.fi* website providing the company registration information of the governmental Patent and registration office. Only the most up to date information was used and it was for all companies from the previous year 2017. All the websites were accessed between November 2018 and January 2019. Four of the studied companies were publicly listed and their annual reports 2017 were available as background information. The annual reports of the four private companies were not available. The only exception was the private *Financial review 2017* of Company E that the researcher had access to through employment.

The two private documents, the customer-specific *RACI (responsible, accountable, consulted, informed) matrix* from the Pilot Company and the *service components agreement appendix* from Company E, were used to further develop the preliminary service component framework (Table 1) before the actual case study interviews. Due to the complexity and business criticality of the software provided by Company E, their agreement appendix was covering a wide spectrum of service components related to preventive measures and recovery. However, the service components in this list were at a very high level. On the other hand, the RACI matrix of the pilot company was much more detailed. However, the software provided was far simpler and less business critical, which resulted in a narrower spectrum of service components covered. Nonetheless, together these two documents and the preliminary framework helped to form a more comprehensive service component framework (Appendix A) that was used in the interviews and later developed further with the interview data.

Table 2: Documentation used in this study

Company	Public documentation	Private documentation
Pilot	Company website, Asiakastieto.fi website	A customer-specific RACI (responsible, accountable, consulted, informed) matrix
A	Company website, Asiakastieto.fi website	-
B	Company website, Asiakastieto.fi website, Annual report 2017	-
C	Company website, Asiakastieto.fi website	-
D	Company website, Asiakastieto.fi website	-
E	Company website, Asiakastieto.fi website	Agreement appendix showing the included service components, Financial review 2017
F	Company website, Asiakastieto.fi website, Annual report 2017	-
G	Company website, Annual report 2017	-
H	Company website, Annual report 2017	-

3.2.2.2 Pilot interview

Conducting a pilot interview before the actual interview was highly encouraged by Hirsjärvi and Hurme (2008). According to them, the idea of a pilot interview is to test the interview agenda, structure, and questions. Pilot interviews can also help to reveal the actual duration of the interviews (Hirsjärvi and Hurme 2008). The pilot interview was conducted on the 29th of November 2018 with the Sales Director/Key Account Manager of the pilot company. The pilot company was a small Finnish software company focusing on software development and maintenance. The interview was held face to face in Finnish and lasted 51 minutes. The results from the pilot interview are not included in this study.

The pilot interview resulted in updating the service component framework and separating it as its own theme in the interview structure. Apart from that, no major changes were made to the interview agenda. Moreover, the

pilot interview helped to get a valuable point of reference for Company E (where the researcher was working) for the researcher to better understand the study topic as a whole and ask more on-point questions in the actual interviews.

3.2.3   Interviews

Interviews can be regarded as *"one of the most important sources of case study evidence"* (Yin 2018, p. 118). More specifically, according to Eisenhardt and Graebner (2007), interviews often become the primary data source of multiple case studies focusing on less everyday and more strategic phenomena, which also is the case in this study. Moreover, according to Hirsjärvi and Hurme (2008), interviews are very suitable for relatively unknown research topics, because it is hard to know the direction of the answers beforehand. Other advantages of interviews are that the answers can be clarified and set in a larger context, and more detailed questions or additional reasoning can be asked, when necessary (Hirsjärvi and Hurme 2008). These all are significant advantages for this study, because the topic seems to be quite unresearched and it looks like common terminology regarding the study topic has not yet been established. Thus, it would be difficult to gather information about the topic without the possibility to clarify the questions and answers as well as ask for additional details.

One interview was conducted with each of the case companies. The main reason for this was the limited resources for the study. When deciding between more cases with one interview and fewer cases with several interviews, more cases was selected, because it could provide a better understanding of the quite unresearched topic and allow for comparison between the cases. Additionally, several interviews per company would have also required more resources from the case companies, which might have made finding them harder.

All eight interviews with the case companies were conducted between the 11th of December 2018 and the 18th of January 2019. Six interviews were conducted with Finnish companies and held face-to-face in Finnish. Two interviews with the US-based companies were conducted via an online call in English. All the interviews lasted about one hour, which was also the time reserved for them.

Notes were taken during the interviews and all interviews were recorded with the permission of the interviewee. Recordings were used to complete and clarify the preliminary interview notes. Within four days of the interview, the interview notes were shared with the interviewee for review and corrections. Additional questions and required clarifications were marked as comments in the file and the interviewee could then directly respond to them and add their own comments. After this procedure, the notes were extensive enough for the research and full transcripts were not needed for the analysis. The interview notes are not published as part of this thesis for confidentiality reasons.

3.2.3.1 Interview structure

Case study interviews resemble guided conversations where a consistent line of inquiry exists, but the actual stream of questions is not that rigid (Yin 2018). This definition of case study interviews by Yin (2018) seems to be very close to what Hirsjärvi and Hurme (2008) call a thematic interview.

A thematic interview is a semi-structured interview where predetermined themes are discussed freely. Thematic interviews can be either quantitative or qualitative, consist of one or several interviews, and be as comprehensive or *"in-depth"* as wished. In other words, the themes discussed stay the same for all interviewees, but the guiding questions and their order can vary between the interviews. (Hirsjärvi and Hurme 2008)

The interview structure and the objectives of each interview section are shown in Table 3. The themes discussed in the interviews were (1) service components, (2) revenue model, (3) the service component framework, and (4) discussing the revenue model. Before proceeding to the actual interview themes, the interviewee's background and the company context were briefly discussed. Feedback about the interview was asked in the end. Before starting an interview, the thesis topic, the aim of the study, and some practicalities were explained shortly. The detailed interview agenda can be found in Appendix B. This interview agenda was only used as a reference and the actual questions as well as their order varied based on the flow of the discussion.

Table 3: Interview structure, objectives and research questions

Section	Objective	Research question
Introduction	Introduce the topic and the aim of the thesis. Give an overview of the interview structure and practicalities. Ask for the permission to record the interview.	-
Interviewee background	Gather background information about the interviewee and their role in the company and SaaS operations.	-
Company context	Get an overview about the company context including the basic company information, the products and services offered, and their own definition of SaaS.	-
Theme I: Service components	Gather general information about the company's service components offering by discussing briefly what kind of services are offered with SaaS.	RQ1
Theme II: Revenue model	Identify the different SaaS revenue streams of the company. Get a basic understanding of what service components are included in the different revenue streams and what factors affect the price.	RQ2 & RQ3
Theme III: Service component framework	Identify the different service components that the company offers with SaaS by going through the service component framework (Appendix A). Define which service components are included in which revenue streams identified in Theme II. Update the service component framework, if something new comes up.	RQ1, RQ2, & RQ3
Theme IV: Discussing the revenue model	Discuss the motivation behind the revenue model and how the model is working in the company's context. Exceptions to the model can be identified, information about the pros and cons of the revenue model gathered, and the evolution and future direction of the model revealed.	RQ2 & RQ3
End	Offer room for free comments and get feedback about the interview.	-

According to Hirsjärvi and Hurme (2008), the studied themes and key terms should stem from the theory that is related to the research problem. In this case, little research about this specific topic was found, but the most related theoretical concepts were summarized in the SaaS revenue model framework (Section 2.2.2.3). The dimensions of the framework were incorporated in the theme interviews. Also, the service component framework (Appendix A) used in the interviews, had its foundation in the existing academic literature and *ITIL Service Operation* (Steinberg 2011) best practices. However, most of the theoretical concepts were not mentioned to the interviewees, because they would probably have been unfamiliar and confusing. The only theoretical terms that were brought up as such were *revenue model* and *service component*. These two concepts were also briefly explained to get a common ground for the discussions.

The themes of the theme interviews were closely related to the research questions of this study. *Theme I* corresponds to RQ1 and *Theme II* to RQ2 and RQ3. However, during the interviews the discussion about Theme I (Service components) and Theme II (Revenue model) was often somewhat mixed and issues related to both often came up simultaneously. When going through the service component framework in *Theme III*, all the three research questions were addressed, because based on the pilot interview, it was easier to go through the list only once and discuss both service components and revenue models. The service components and revenue model were discussed openly (Themes I and II), before going trough the framework (Theme III) to prevent the interviewees from focusing only on the service components already included in the list. This helped in bringing up service components that had not been identified before. However, the list structure in *Theme III* significantly helped the interviewees to think about service components both from a wider perspective and in more detail. In the end of the interviews, the current revenue model of the case company was discussed more freely to get a more in-depth understanding of the company context and its revenue model (*Theme IV*). The discussion addressed the exceptions to the model, the pros

and cons of the model, and the evolution as well as the future directions of the model. However, this part was quite different in the different interviews due to the interviewees' diverse backgrounds, roles, personality, and the company itself.

3.2.3.2 Informants

To find knowledgeable interviewees from the case companies, the primary contacts from the case companies were reached by email with a brief description of the study (Appendix C). In the email, the recipients were asked to suggest from their company interviewees having the required knowledge to be able to discuss the themes described in the email. In the end, the interviewees represented several different roles and operations partly due to various organizational structures and responsibilities as well as employees' schedules and previous career paths. The working titles of the interviewees as well as their roles in SaaS operations are presented in Table 4.

Due to the diversity of the interviewees' backgrounds and roles, also their viewpoints to the service component offering and revenue model of the company varied quite a lot. For example the interviewees from Companies B, D, and G had quite technical viewpoints while the interviewees from Companies F and G were much more focused on the strategic level. The possible effects of these differences to the findings of this study are discussed in Section 6.7. Also it should be noted that the researcher was working in one of the case companies, Company E. Thus, the researcher knew the company and its business much better than the other case companies and also could go into much more detail in the interview.

Table 4: Informants and interviews

Company	Working title	Role in SaaS operations	Interview
A	Customer Engagement Director	Previously responsible for all Customer Success operations that has been now divided into Client Management and Customer Engagement. Customer Engagement helps implementing and integrating the SaaS to customers' routines.	11.12.2018, 64 min, face to face
B	Senior Vice President for Products and Technologies	Responsible for all the software products the company is offering, SaaS products among them. Not directly working with sales or maintenance, but involved in product offering, upgrades, and development.	20.12.2018, 60 min, face to face
C	Vice President for Customers (also Co-founder)	Leading Company C's Customers team that is responsible for both sales and marketing as well as the account management of current SaaS customers. Co-founder of the SaaS company.	13.12.2018, 56 min, face to face
D	Technical Account Manager	Helping Key Account Managers with technical issues for all UK-based SaaS customers. Rotating shift in company's support function.	14.12.2018, 46 min, face to face
E	Chief Operating Officer	Managing all customer-related operations including both SaaS projects and continuous services for SaaS customers. Continuous services include SaaS maintenance as well as additional customer-related projects.	11.12.2018, 64 min, face to face
F	Vice President for Product Management	Managing two out of five SaaS product lines. Previously responsible for another SaaS product line. Product management includes product planning and pricing.	18.1.2019, 70 min, face to face
G	Chief People Officer (previously Senior Vice President for Professional Services)	Leading all HR operations globally. Previously responsible for all customer facing operations including implementations and customer success. Been in the company for 15 years and seen the shift from traditional licences to SaaS.	8.1.2019, 56 min, online call
H	Principal Solution Engineer	Working with sales and demoing the product to current customers and prospects.	16.1.2019, 61 min, online call

3.3 Data analysis

The initial notes were categorized into higher level themes and more detailed discussion topics immediately after the interviews. For example, all issues regarding the company's product were collected under a topic called *"Products"* and placed under a wider theme called *"Company background"*. The themes that emerged from all interview notes were nearly the same as the initial thematic interview themes presented in Section 3.2.3.1. The only exception was that the originally separate themes *Service components* and *Revenue model* were now combined into a theme called *Revenue model and service components*, because the discussions and issues related to these were often quite mixed.

The topics under each theme varied a bit across the interviews depending on the company operations, the flow of the interview discussion, and the interviewee's role. For example, some of the interviewees brought up clear pros and cons of the company's current revenue model, but others did not. The initial notes placed under the topics were complemented and new topics added, while listening to the interview recordings.

During the initial categorization, also the company's revenue model in the form of revenue streams was drafted. In addition, the service component framework used in the interviews (Appendix A) was included in all the interview notes with markings about which service components the company was offering and in which fee or revenue stream they were incorporated. Moreover, all the comments and discussions about the service components were written down under each service component list category. This version of the interview notes was the version that was sent to all the interviewees for checking and corrections.

The interview notes were analyzed in an inductive manner. The inductive approach was chosen, because no previous studies about the exact research

topic were found and the theoretical background of the study, including the preliminary Service component framework and the SaaS revenue model framework, were built by combining various aspects of different studies. Thus, these two frameworks did not stem from empirical finding and had not been tested before.

The preliminary service component framework was complemented continuously during the empirical study and thus, the preliminary framework did not provide any additional point of reference for the data analysis. The SaaS revenue model framework, on the other hand, was not considered solid enough to be the starting point of the actual data analysis. Even though it was used in the later stages of the analysis, the data was first analysed inductively and only in the later phases it was used to complement and unify the presentation of the revenue models.

The inductive approach to data analysis was supported by Eisenhardt and Graebner (2007) who claimed that case studies are one of the best ways to convert inductively rich qualitative evidence into theory that can then be further tested and developed by deductive research. According to them, this is why inductive theory building from cases can be seen as complementing the mainstream deductive research.

According to Eisenhardt and Graebner (2007), when building theory from cases, each case is first analyzed as its own unit and then the recognized patterns of relationships are compared across the cases to find the underlying logical arguments. The theory development is done by *"recursive cycling among the case data, emerging theory, and later, extant literature"* (Eisenhardt and Graebner 2007, p. 25).

Next, the inductive data analysis and theory building is presented in two parts. First, the analysis related to the service components that was related to RQ1 and RQ3 is presented. Second, the analysis of the revenue models related to RQ2 is described.

3.3.1   Service components

To analyze the service component offering of the case companies, each company-specific service component lists including markings about which service components the company was offering and in which fee or revenue stream they were incorporated in, were combined. After this, the interview notes were read through and all explicitly and implicitly mentioned services and discussions about them were highlighted. These highlighted parts were then compared to the combined service component list. If an additional service component came up in the interview notes, it was added to the list. After that, all company-specific notes were checked and all companies offering a similar service component were marked in the list. This was done in a recursive manner between the interview data and the list.

The service components were re-categorized, when the list was completed and no new service components came up. Thereafter, each category was checked so that the service components were not overlapping. Very similar service components that were also identical in the companies, were combined into one. Additionally, some very unclear service components containing too diverse or vague notes were removed. Finally, the service components were reviewed in each company's context and if there was a lot of variation in how the component was offered, the service component was split into several. When all the service components were gone through, the categories and service component names were checked and small modifications made.

Because the list changed radically in this process and the researcher had to make some interpretations about what the companies were actually offering and how, the new list was sent for another check to the interviewees. Six of the interviewees went the list through in detail, but two of the interviewees never answered regardless of email reminders.

After the checking step, the service component categories were re-ordered so that related categories were placed close to each other. During this process, it came up that actually half of the service components were closely related to the software product, while the other half was tied to the supporting and additional services. Thus, the final Service component framework consisted in the end of *Software-related service components* and *Service-related service components.*

Two versions of the framework were made for presenting the results. The first version included markings of how the service components were included in the revenue models and the second version the markings of if the offered service component was offered to all customers or only to some customers with additional fees or on request. The second version of the service component framework was also split to parts (software-related and service-related service components)for presenting the results.

3.3.2   Revenue models

The same recursive approach was applied to the analysis of the revenue models of the case companies. As mentioned before, the revenue streams of the case companies were drafted as a list already in the initial categorization of the interview notes. After this, the initial interview notes including the drafts of the revenue streams were sent for checking to the interviewees.

The drafts of the revenue streams were compared and modified so that the different revenue streams became similar in all the case companies. Also, the contents of the streams were compared and modified so that they were at the same level of detail. After this, the revenue streams were drawn as figures depicting higher level revenue models. During this drawing process, similar parts that formed the revenue models as well as individual metrics that affected the sizes of the different parts were identified.

Next, the initial figures of the models were further developed with the help
of the SaaS revenue model framework presented in Section 2.2.2.3. During
this step, the goal was to check that the terminology used in the models
corresponded to the terminology used in the theoretical background presented
Chapter 2. In addition, the models were checked so that all the dimensions
of the SaaS revenue model framework were somehow included.

The last step of the analysis of the revenue models was the detailed comparison
of the models and their contents presented in Section 5.2.9. The revenue
model characteristics and elements were both compared separately with the
help three tables. These tables were Revenue model characteristics Table 8,
Bundles in the revenue models Table 5.2.9, and Price metrics in the revenue
models Table 10. This comparison also helped to fix some inconsistencies in
the revenue model figures that are presented in Section 5.2.

Chapter 4

Case descriptions

This chapter gives an overview of the eight case companies of this study. The information presented here is based on publicly available information like company websites and the interviews described in Section 3.2.3. The reason for also using the interviews as a source here is that the publicly available information about the companies' products and business was very limited. This information is crucial in being able to understand the service components and revenue models of the companies.

The basic information of all eight case companies is presented in Table 5. For confidentiality reasons, the case companies are referred to as Company A, B, C, D, E, F, G, H. The companies are ordered according to the size of their turnover so that A is the smallest and H the biggest.

The case companies of this study varied, among other things, by age and size. Three case companies were over 30 years old, one about 20 years, two about 15 years, and two had just reached the age of 5. The turnover of the companies spanned from under 10 MEUR (3 companies) through 25 MEUR (2 companies) and 150 MEUR (2 companies) up to 7300 MEUR (1 company). Also the number of employees ranged from around 70 to 30 000. Six case case companies were located in Finland and two in the United States. However, all case companies had presence both in Europe and the USA. Half of the companies had several offices in Europe and half had presence on more than two continents.

All case companies were offering their software products with the SaaS model to enterprise customers (B2B SaaS). In addition, three case companies had customers using their software products with traditional licences. However, only one case company was offering traditional licenses to new customers. Three case companies were offering only one product and six were offering several products.

Table 5: Basic information about the case companies

Case company	Founded in	Turnover 2017	Number of employees	Locations	Products	SaaS type
A	2013	2 MEUR	200+	HQ: Finland Offices: 4 in Europe and 1 in North America	SaaS company data platform	Multitenancy, configuration, non-business critical
B	1991	9 MEUR	70+	HQ: Finland Offices: 1 in Europe	Four products for business process modelling and analysis, offered both with traditional licenses and as SaaS (20%)	Single-tenancy, customization and configuration, non-business critical
C	2003	9 MEUR	140+	HQ: Finland Offices: 1 in North America	SaaS procurement analytics software	Single-tenancy, customization and configuration, somewhat business critical
D	2013	23 MEUR	300+	HQ: Finland Offices: 14 all over the world	SaaS social media marketing platform	Multitenancy, configuration, non-business critical
E	2005	24 MEUR	500+	HQ: Finland Offices: 9 in Europe and 1 in North America	Two SaaS products for retail planning	Single-tenancy, customization and configuration, business critical
F	1985	150 MEUR	1500+	HQ: Finland Offices: 24 all over the world	Five SaaS products for financial processes and management	Multitenancy, customization and configuration, quite business critical
G	1985	150 MEUR	1000+	HQ: USA Offices: 1 in North America, 6 in Europe, 1 in Australia	Two SaaS products for price optimization, sales effectiveness, and revenue management	Single-tenancy / multitenancy, configuration, business critical
H	1999	7300 MEUR	30000+	HQ: USA Offices: 52 all over the world	SaaS CRM platform and other related SaaS products	Multitenancy, customization and configuration, quite business critical

4.1   Company A

The product of Company A is a company data platform that is used by around 2000 companies for prospecting and sales intelligence. The majority of the customers are Finnish small or medium-sized companies. The users of the software are normally working on sales and the software is not business critical.

All the customers are using the same environment, but have access to separate workspaces within the software (multi-tenancy). There is no customization and all customer-specific requests are forwarded to product development. The customer-specific configurations are a selection of data sources and standard integration interfaces. In addition, there are customer-specific saved views containing data filters that can also be modified later. The configurations are done as part of a separate onboarding that lasts either three, six or ten hours. Most of the time in onboarding is spent on consultation and training, and making the technical configurations lasts normally around 30 minutes. Onboarding is compulsory for new customers and covered with a separate fee.

4.2   Company B

Company B offers four separate products for strategy execution, performance and process management, process mining, and enterprise architecture. SaaS model has been in the offering for a few years now and out of the company's over 2000 customers around 100 are using SaaS. The customer base consists of big and medium-sized public and private organizations from all over the world. The software is always used by only a few employees for planning and reporting purposes and the users vary from process analysts to enterprise top management. None of the software products are business critical.

All of the company's products are offered both as SaaS and with traditional licenses together with a separate maintenance fee. The software is offered as single tenancy and every customer has their own environment. Currently there are around 100 customer-specific environments, all of which are running the newest version of the software product.

The actual software products are not modified, but customization and configurations are done. There is big variation in the amount of customization and configuration between the software products and the process can last from a few days to a few weeks. For one of the products, only import file formats, and, in some cases, dashboards are configured. In contrast, for another product, custom indicators and metrics are built and the looks of the user interface is changed to match the customer's brand. Other configurations of the software products can include custom forms and reports. The configurations are normally done by Company B with ready-made scripts, but in some cases they can also be done by its partners on a separate configuration platform. Customization and configuration are done in a separately priced implementation project that also includes consultation and training.

4.3   Company C

The product of Company C is a procurement analytics software that consists of five software modules. Most of the customers are using 1-3 modules out of 5 and over half of the customers use several modules. The customers of Company C are big multinational companies that have a yearly turnover exceeding 1000 MEUR. A majority of them are based in Europe or the US, but a few customers also come from Africa and Asia. The customers are either from manufacturing or service/retail industries. In addition, a few consulting companies are using the software for their own customer projects. The software users are normally from the purchasing and procurement divisions. The software is not very business critical.

The software architecture is single tenancy and all customers have a dedicated environment. There are currently around 60 customer-specific environments, 100 consulting environments and 100 internal testing and development environments. Software updates have been automated and all commercial environments are running the same version of the software.

Even though the actual software product is not modified, both customization and configuration are necessary for new customers. These take place within a separate implementation project that typically lasts 3-9 months and is separately priced. During the implementation project, customer-specific integrations to their other systems are built, customer-specific KPIs (Key Performance Indicators) configured, and the users are trained.

4.4 Company D

The product of Company D is a social media marketing platform that is used by around 600 companies for social media marketing optimization. The customers vary a lot in size and industry and come from around the world. The users of the software are normally from social media marketing teams and the software is not business critical.

All the customers are using the same environment, but have access to separate workspaces within the software (multi-tenancy). There is no customization and all customer-specific requests are forwarded to product development. The customer-specific configurations are user accounts and groups, and the selection of social media channels as well as standard integration interfaces. A 14 day onboarding period is included in the standard SaaS fee and during that time the dedicated Customer Success Manager trains and consults the users.

In addition to SaaS, Company D is also offering a Managed Service option, where also the actual marketing and content creation are included in the monthly fee. However, a clear majority of the customers are using the normal SaaS. Some of the customers start with a few months of Managed Service for training purposes and after that change to the normal SaaS.

4.5 Company E

The offering of Company E consists of two separate retail planning software products that are offered as SaaS. However, in this thesis, only the supply chain management software is taken into account, because it is more complex and used by a majority of the company's customers. The software consists of 22 modules and the customers are normally using several modules. The company has around 250 customers, mainly retailers from Europe and the US. The size of the customer companies varies from rather small companies to big multinational corporations. The actual software users are working with replenishment and the software is very business critical.

The customers are using a dedicated environment that is running its own instance of the software (single-tenancy). There are around 250 customer-specific production environments. In addition, there are customer-specific reserve and testing environments as well as internal testing and development environments. The environments are running different versions, but only releases from the latest 12 months are supported. Version upgrades are coordinated separately with the customers.

The product includes a lot of customization and configuration and a separate implementation project is needed for all new customers. The length of the implementation project depends on the size of the customer and the complexity of the needed solution. It can range from a few months to several years and the project is priced separately. The implementation project consists of building

the customer-specific interfaces as well as making the required changes to the logic and the user interface. In addition, consultation and training are included. Most of the customer-specific changes are made in separate code files and some directly in the user interface. Often customizations and configurations are also done later during the use of the software.

4.6   Company F

The products of Company F are divided into five product lines for financial management and processes. Technically two of the product lines are different modules of the same software, but they are treated more or less as separate products. None of the products are currently further divided into separately offered modules, but some of the products can be used together. This thesis focuses on the Accounts payable, Procurement, and Network products that can all be used together. The reason is that the interviewee was working with these products and was familiar with them.

The 35-year-old company started offering SaaS around 10 years ago and stopped offering traditional licences to new customers two years ago. The aim is to move all existing customers to SaaS within the next two years. The products of Company F are used by tens of thousands organizations worldwide. Most of the users are using the Network product that has been SaaS from the very beginning. Around 2000 customers are using the Accounts payable and Procurement products. Less than half of these customers are using them with SaaS. The customers vary from very small companies to the world's largest corporations, the majority being rather big companies with a turnover exceeding 300 MEUR. Most customers are from Europe and the US. There is no specific industry focus and the software products are primarily used by financial management and procurement departments. The software products are used daily and, thus, they are quite business critical.

The software products are offered with multi-tenancy architecture and all the customers also have a separate test environment. New versions are released monthly and all environments are updated to the newest version of the software. The customer's test environment is upgraded first, because the products involve both customization and configuration. Traditionally there has been a lot of customization, but since the transition to SaaS, the aim has been to reduce that. Lately standard integration interfaces have been built, but still additional integration is often needed. Main configurations of the product are the customer-specific financial processes and rules. Customizations and configurations are done mainly by Company F, but also its partners can do them. The implementation project can last from three months to several years. Normally the implementation project takes 6-12 months. The implementation project also includes training and consulting and is priced separately.

4.7 Company G

The product offering of Company G consists of two separate SaaS products targeted at different industries. Both products include 4-5 separate modules. The products are used by around 350 customers globally for price optimization, sales effectiveness, and revenue management. The customers vary from companies with a turnover of around 200 MEUR to the biggest multinational corporations of the world. The customer base covers over 30 different industries ranging from manufacturing and retail to travel and B2B services. The software products are often used by revenue analysts, but they can also run more or less automatically in the background. This is why the software products are very business critical.

The 30-year-old Company G has changed its offering from traditional licences and separate maintenance fees to SaaS 3.5 years ago. Nowadays nearly all customers are already using the SaaS products. Some products are offered with a pure multi-tenancy architecture, but most customers are using

a dedicated environment that is running its own instance of one of the software product (single-tenancy). However, since the provisioning of single-tenancy environments is automated, the difference to multi-tenancy is not apparent to the customer. The different customer environments are running different versions of the software and upgrades are coordinated separately with each customer. Additionally, the customers also have a dedicated test or development environment.

The two products cannot be customized, but because they need to be connected to the customer's other systems, custom integrations might be needed. All other configurations are made directly through the user interface and the configurations are mainly the customer-specific pricing formulas. These customizations and configurations as well as initial training and consulting are done either by Company G or its partners as a separately priced implementation project that normally lasts a few months. After the implementation project, the customers' super users of the software are able to change the configurations.

4.8   Company H

The primary product of Company H is a CRM platform. In addition, there are around 8 supplementing products that can also be used alone. Most of the supplementing products have become part of the product portfolio through company acquisitions. Company H has been offering its products as SaaS already since the founding of the company in 1999.

Most of the customers are using only one or two products, whereas some have all the products in use. Company H has over 150 000 customers worldwide and they vary from the biggest corporations of the world to very small companies employing only one or two people. With the US standards, a majority of the customers are either big or medium-sized companies. Healthcare, financial

services providers, and manufacturing are the biggest customer segments. The actual users of the software depend on the product. Often the users include both the actual end-users like sales people or marketing professionals and their managers. Some of the products, like the service platform for support teams, are very business critical, whereas some, like the sales platform, are not that business critical.

Even though the software is operated in a multi-tenant way, the customers can also purchase the software as a separate instance (single-tenancy). However, none of the customers has chosen this option so far. Most customers have separate test or training environments in addition to the actual production environment. All environments are running the newest version of the product and they are updated automatically.

Even though the actual product is not modified, both customization and configuration often take place. However, no customization or configuration are necessary and the customers or third-party service providers can also handle them. Configurations often include, for example, business-specific terminology, product names, and sales stages. Customizations can include user interface changes and custom reports. Additionally, integrations to other systems are often needed, but mostly the customers take care of them themselves. An implementation project can take from few weeks to several months or even years. If the implementation project is done by Company H, it is separately priced.

Chapter 5

Results

The results of this study are presented in this chapter. Even though this study was conducted as a multiple case study, the results are shown according to the three research questions instead of first focusing on individual cases. This allows for better comparison between the different approaches taken in the case companies. The service components offered by the case companies are presented and compared first. Second, the revenue models of all the case companies are described first individually and thereafter compared across the cases. This chapter is concluded by showing how the service components are included in the revenue models of the case companies.

5.1   Service components

The first research question, *"What service components can be offered with B2B SaaS and how does the service component offering differ between different kinds of companies?"*, is answered in this section. The individual service components offered by the eight case companies were divided into two groups: *Software-related* (Table 6) and *Service-related* (Table 7).

The service components that a case company (A-H) offers to all its customers are marked in the Tables 6 and 7 with *"X"*. If a service component is offered to some customers only, it is marked with *"/"*. This is the case, for example, when the service component is included only in some service levels or separate subscription services. The service components that are not included in the normal service offering of the company are left blank. However, if the service component is technically possible to offer and the customer specifically asks for it and is willing to pay, it might be offered separately only to this customer. Also, the service components containing the word "periodic" are left blank in the tables, if the service is not specifically offered periodically. Often the service can be obtained by buying similar "on request" services periodically, but in this case, the service component itself is not periodical.

5.1.1 Software-related service components

The Software-related service components are closely related to the technical features and continuous maintenance of the software (Table 6). Thus, most of the service components in this group are somehow related to preventing disruptions in the use of the software. There are 14 Software-related service components in total and they are divided into three categories. The category *Maintenance* includes 3, *Preventive measures and recovery* 7, and *Upgrades* 4 service components. All eight case companies offered service components from all three categories. The Software-related service component offering varied between 4 (2 companies) and 12 (1 company) service components.

The three service components within the category Maintenance are *Hosting and infrastructure*, *Event, incident and problem management for internal cause*, and *Event, incident and problem management for external cause*. If the event, incident, or problem was caused by the software company's own actions or it was related to the software company's responsibilities, it was referred to as an "internal cause" and if it was clearly caused by the

customer's actions, it was called an "external cause". The software products of Companies A and D were so simple that the customer could not really cause any problems. Thus, these two companies did not offer the service component Event, incident and problem management for external cause. Apart from that, the service component offering was identical in all the case companies. All service components that were offered from Maintenance, were offered to all customers.

Table 6: Software-related service component offering

Category	Service component	Case company							
		A	B	C	D	E	F	G	H
Maintenance	Hosting and infrastructure	X	X	X	X	X	X	X	X
	Event, incident and problem management for internal cause	X	X	X	X	X	X	X	X
	Event, incident and problem management for external cause		X	X		X	X	X	X
Preventive	Data backups	X	X	X	X	X	X	X	X
measures	Logging and monitoring customer's environment		X	X		X	X	X	/
and recovery	Customer-specific test environment			/		X	X	X	/
	Test environment synced with customer's production environment					/			/
	Reserve options within the software for use during disruptions					X			
	Periodic recovery testing from customer's backups							X	
	Possibility for the customer to download their data backups								X
Upgrades	New versions and releases	X	X	X	X	X	X	X	X
	Customer's test environment upgraded before production					X	X	X	/
	Upgrades coordinated separately with each customer					X		X	
	Customer-specific upgrade testing by the case company					/		/	

X = offered to all customers, / = offered to some customers

In addition to Hosting and infrastructure and Event, incident and problem management, all the case companies were offering *Data backups* from the category *Preventive measures and recovery* and *New versions and releases* from the category *Upgrades*. In other words, these can be said to be the basic building blocks of providing a fully maintained service: offering the service over the internet (Hosting and infrastructure), developing and maintaining the software (New versions and releases), resolving the occurring technical problems (Event, incident and problem management for either internal or external causes), and preparing for possible disruptions beforehand (Data backups).

The rest of the Software-related service components (in the categories Preventive measures and recovery and Upgrades) can be seen to be somehow related to preventing disruptions, because also the service components in the category Upgrades aim at preventing problems caused by upgrades. Companies A and D that provided non-business critical software products did not offer any Software-related service components apart from the four service components offered by all the case companies. The third, Company B, operating non-business critical software products, offered only *Logging and monitoring customer's environment* in addition to the four common service components. Companies E and G, with the most business critical software products, were both offering 11 or 12 out of 14 Software-related service components. Thus, it seems that the software-related service component offering was in line with the business criticality of the software product.

The first service component from the category Preventive measures and recovery that was not offered similarly by all the case companies was Logging and monitoring of customer's environment. It was offered by 6 out of 8 case companies and seemed to be linked to the customizability of the software product itself or custom integrations. The only companies that did not offer this component were Companies A and D that did not customize their software products at all. In addition, Company H provided this service component only to some of their customers. The reason for this seemed to be that many customers were small, did not have customizations and, thus, did not need it.

The next service component from the same category, *Customer-specific test environment*, was offered by 5 case companies (C, E, F, G, H). Two of these (E, H) also offered their customers the following service component, *Test environment synced with the customer's production environment*. Syncing the customer's test environment with the customer's production environment means that the two environments have identical settings, customizations, and data. It seemed that test environments were needed, if the software

product was customized and/or business critical. Three companies (E, F, G) had customer-specific test environments for all their customers, and two (C, H) only on request. The software product of Company C was somewhat business critical, but very customized, whereas the software products of Company H were quite business critical and sometimes very customized. The customizability and business criticality of the software also seemed to be related to the need for a synced test environment.

The last three service components of the same category, *Reserve options within the software for use during disruptions*, *Periodic recovery testing from customer's backups*, and the *Possibility for the customer to download their data backups*, were all offered by only one of the eight case companies. It seemed that these service components were closely related to the purpose of the software and the productization of the service components. Only the business critical software product of Company E provided an opportunity for reserve options to enable the use of the software even without the latest data. Periodic recovery testing from customer's backups, on the other hand, was productized by Company F that offered very business critical software products. Only Company H had productized the possibility to download backups. Most companies did not offer it, because the backups were not that important or they were so big that they would be very slow and expensive to transfer.

It might seem questionable that Reserve options within the software for use during disruptions was offered by only one of the case companies. The reason for this is that, for example, guaranteed up-time by mirrored data centers, was not considered as a reserve option *within* the software. These kind of service continuity options were not included in the service component framework as a separate service component, because the technical solutions behind this kind of services were were different and hard to compare without going into technical details.

All other service components except New versions and releases from the last category Upgrades, were offered only by companies offering either quite or very business critical software products. It seemed that if the customer had a test environment, it was upgraded first. This provided the customer the possibility to test, but did not require additional resources from the SaaS provider. With very business critical software products (E, G), all upgrades were separately coordinated with each customer. Additionally, customer-specific upgrade testing could be done, but it was not done for all customers due to the cost of manual work.

5.1.2 Service-related service components

The Service-related service components can be associated with people and customer service (Table 7). There are 16 Service-related service components in total divided into five categories. The category *Support* includes 4, *Technical services* 3, *Business services* 2, *Education and training* 3, and *Overall service management* 4 service components. All eight case companies offered service components from all five categories. However, only one service component, *Online trainings and webinars* from the category *Education and training*, was offered by all case companies to all their customers. The Service-related service component offering in the case companies ranged from 9 (1 company) to all 16 (1 company) service components. Thus, the offering was more similar than in the Software-related service components. However, there were bigger differences in which service components the companies offered to all their customers and which not.

The biggest differences in the Service-related service component offering were in the first category Support. All the companies, except the biggest company (H), offered *Central support/helpdesk* to all their customers. The reason for this was that Company H aimed at serving a wider customer base by offering the possibility to buy the use of the software cheaper with only very minimal

product support attached to it. Six out of eight case companies followed a similar strategy in offering increased support to some of their customers. The increased support differed a lot in the companies, but it could mean longer service hours, more channels to reach support, more tickets per month, or shorter response times.

Table 7: Service-related service component offering

Category	Service component	Case company							
		A	B	C	D	E	F	G	H
Support	Central support/helpdesk	X	X	X	X	X	X	X	/
	Increased support availability (service hours, channels, tickets, response times)	/	/			/	/	/	/
	Business contact person	/			X	X			/
	Technical contact person					X	/	X	/
Technical services	Technical consulting on request	/	/	/	/	/	/	/	/
	Additional customization on request		/	/		/	/	/	/
	Configuration changes on request		/	/		/	/	/	/
Business services	Business consulting on request	/	/	/	/	/	/	/	/
	Periodic business consulting	/			/		/	/	/
Education and training	Online trainings and webinars	X	X	X	X	X	X	X	X
	Training packages	/							/
	Tailored trainings on request	/	/	/	/	/	/	/	/
Overall service management	Account management	X	X	X	X	X	/	X	/
	Periodic review meetings	/	X	/	X	/		X	/
	Periodic overview reports	/	X	/	X	/		X	/
	Incident and problem reports on request		X		X		/	X	/

X = offered to all customers, / = offered to some customers

Some of the companies also had designated technical or business persons for either all or some of their customers. The designated persons were offered either because customer-specific knowledge was needed, or because the aim was to provide even better customer service through direct contacts. Only the companies providing the most business critical and customized products (E, G) had designated technical persons for all customers. The reason for this was that the designated technical persons could have customer-specific knowledge to enable quick problem recovery. Designated technical persons were also needed in Company E for additional development that was done for many customers. Companies D and E had designated Business contact persons to all customers, because they were very focused in building good customer relationships and also often provided additional consulting. In both companies the Business contact person was responsible for both consulting and account management for the smaller customers.

All the service components from the categories Technical services and Business services were offered on request. The differences were that the simplest and most standardized software products (A, D) did not need any configuration changes or additional customizations after the software was taken in use. If configurations were changed, they were better described as business consulting than technical tasks. All the companies offered business consulting "on request" and 5 of the companies "periodically".

The service component offering was partly identical and partly very different in the next category Education and training. All the companies offered *Online trainings and webinars* to all their customers and *Tailored trainings on request*. However, many of the companies pointed out that even though tailored trainings were theoretically offered, they were not productized or marketed and, thus, trainings were actually held only within the implementation projects. The only companies with designed *Training packages* in their offering were the smallest company A and the biggest company G. Thus, the components within this category were tightly tied to the productization of the services.

The service components related to the last category, Overall service management, seemed to differ based on the diversity of the customer base and the business criticality of the software product. All the companies with at least somewhat business critical software products were offering all the service components in this category. Companies E and G that offered very business critical software products, provided all service components from this category to all their customers. Companies F and H, with a bit less business critical products and big variation in customer size, provided these service components only to customers with higher service levels. Company C, on the other hand, had a very homogenous customer base (big companies) and offered these service components to all their customers without any separate service levels. The three companies with the least business critical software products (A, B, D) did not provide their customers separate *Incident and problem reports*.

5.2 Revenue models

This section answers the second research question of this study: *"What kind of revenue models do B2B SaaS companies use?"*. First, the revenue models of all eight case companies are presented separately. That is followed by a cross-case analysis of all the revenue models.

The revenue models of the case companies are described with the help of figures that show both the high-level revenue model characteristics and the more detailed revenue model elements. The revenue model characteristics as introduced in the SaaS revenue model framework in Chapter 2, are shown on top of the figures. The revenue model elements of which the fees consist, are presented with different kinds of boxes. Grey boxes are compulsory parts of the fees. Individual white dotted boxes within the grey boxes show the price metrics that affect the price of the compulsory part. If the dotted boxes within the grey boxes are connected, they represent different kinds of product or service bundles that are used for 2nd degree price discrimination. In this case, the customer needs to select one of the connected dotted boxes. A grey dotted box connected to the white connected boxes is the default selection that does not affect the overall price and selecting any of the white connected boxes results in a price increase. White dotted boxes outside the grey boxes are optional parts of the fee (additional service elements or product/service bundles).

5.2.1 Company A

Company A made one-year subscriptions with their customers and the prices were set with a pricelist, meaning that the customers could not influence the price. The yearly subscription fee was either fixed or partly usage-dependent depending on the customer's preference (Figure 5). If the customer wanted to

have a fixed subscription fee, all data could be purchased with a fixed price, and if the customer wanted to pay only for the data used, the subscription fee could be partly usage-dependent with a separate per unit price for each data row or set. Company A also applied *Tiered pricing* in the form of the selection of the *Success plan.* Thus, the subscription fee consisted always of two pricing formulas: either *Fixed price regardless of volume* and Tiered pricing, or *Fixed fee + per unit price* and *Tiered pricing.*
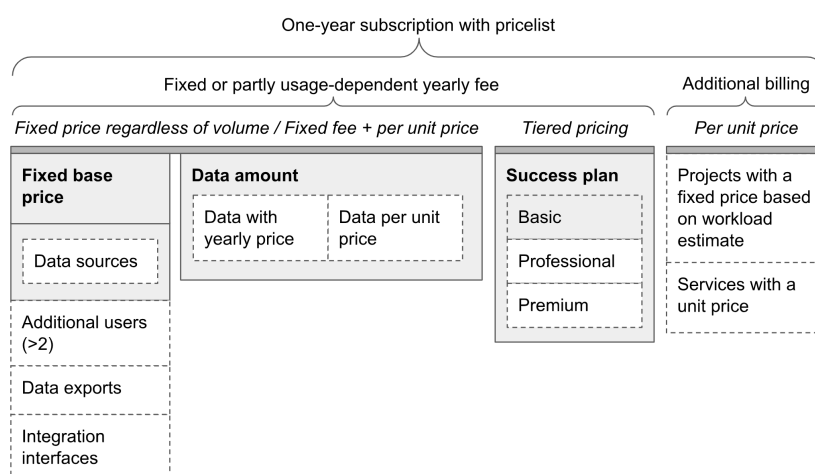
Figure 5: Revenue model of Company A

The customers could also buy services that were not included in the yearly subscription fee with a separately billed *Per unit price.* However, most of the services that the customers were using were already included in the basic subscription or in the higher *Success plans.* Hence, additional services were mainly used when new functionalities or data sources were taken into use. All additional projects and services were offered with a fixed price that was either a unit price or based on a workload estimate. This was because Company A did not yet have a software for tracking billable hours. However, they were currently looking for one, because making accurate workload estimates for completely new requests was found hard.

The fixed part of the subscription fee included a fixed base price for the use of the software and separate prices for data sources that the customer could select. The subscription fee was increased, if the customer needed additional users, data export options, standard integration interfaces, or wanted to pay for all the data with a fixed yearly price. Thus, the price metrics of Company A were *data sources*, *number of users*, *product features*, and the optional *data amount*. All the other price metrics than the optional data amount were usage-independent.

Company A offered three service bundles that were named Success plans and used for 2nd degree of price discrimination. The services included in the Success plans could not be chosen by the customers, but because the customers could also buy services and product features individually, *Bundling and both predefined options and freely chosen amount of some items* was used for the subscription fee. Moreover, *Unbundling* was used for the additionally billed services.

The three success plans differed in terms of services included, hour limits for certain services, and people involved. The *Basic success plan* did not include any other services than very basic chat and email support, and a designated Client Manager for account management. The *Professional success plan* included tailored online trainings, one part of a training seminar, tailored yearly updated workflows, 4 hours consulting from the company's Engagement Managers, usage statistic upon request, and increased support (phone support, chat support for standard integrations, and lower response times). The *Premium success plan* included tailored face-to-face trainings, tailored twice a year updated workflows, 12 hours of consulting from designated Engagement managers, 2 hours technical consulting, quarterly usage statistic reviews and steering group meetings, attendance to training seminars, and increased support (remote access and lower response times).

5.2.2   Company B

Company B made multi-year subscriptions with their customers and agreements were always negotiated. The yearly fee was fixed and consisted of two pricing formulas: *Fixed price regardless of volume* and *Tiered pricing* (Figure 6). Tiered pricing was two-dimensional. The fixed price consisted of a base price and two usage-independent price metrics: *number of users* and *customer-specific agreements*. The customers could also buy additional products that were priced in a similar way, so *additional products* could also be seen as a usage-independent price metric. Tiered pricing was two-dimensional and the customers needed to choose both a *Performance and capacity package* and a *Service level*.
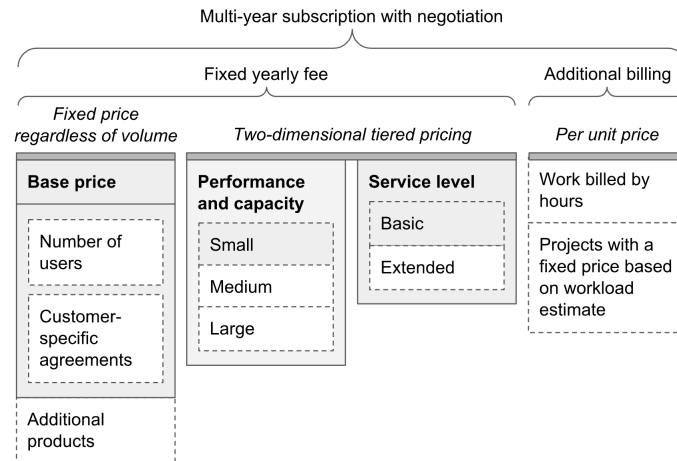
Figure 6: Revenue model of Company B

All the customers were served by a general Support team and a designated account manager from the Sales team. The two service levels differed only by the Service Level Agreements (SLAs), meaning that the customers with *Extended support* had higher priority and lower response times. The performance and capacity levels differed, as the name suggests, in the capacity and performance reserved for the customer. According to the interviewee, it was often hard to estimate the usage beforehand. Hence, often a bit higher level

was first selected and then, after the initial usage peak, the customer switched to a lower level. The same applied for service levels so that the customers often chose the higher service level in the beginning, just in case, and then maybe later switched to the lower level.

Because the services included in the Performance and Capacity packages and Service levels could not be affected by the customers and additional products cannot be regarded as individual services, *Bundling and predefined options* was used for the subscription fee. Moreover, *Unbundling* was used for the additionally billed services.

The additionally billed services were offered with a *Per unit price.* These were either billed by hour or offered as a fixed price project. The only services that were offered with a pay per use -basis were additional projects and services not included in the yearly subscriptions. Smaller tasks were billed by hour with the minimum of one hour. Bigger projects were normally sold with workload estimates and billed by hour. If the customer specifically wanted, the project could also be offered with a higher fixed price.

5.2.3 Company C

Company C made multi-year subscriptions with their customers so that all the agreements were negotiated separately. The fixed yearly fee consisted of only one pricing formula: *Fixed price regardless of volume* (Figure 7). The fixed yearly fee was formed of a base price and usage-independent price metrics that were the selected *modules*, *customer size*, and *customer-specific agreements.* In addition, if the customer wanted to have a test environment, that increased the overall subscription fee. Company C also offered their customers a separate *Data classification service* that covered one phase in the use of the software. Apart from that, support and service were similar to all customers and there were no separate service levels or success plans.

Multi-year subscription with negotiation

Fixed yearly fee   Additional billing

Fixed price regardless of volume   *Per unit price*

Base price	Data classification service	Work billed by hours
Modules		Projects with a fixed price based on workload estimate
Customer size		
Customer-specific agreements		

Test environment
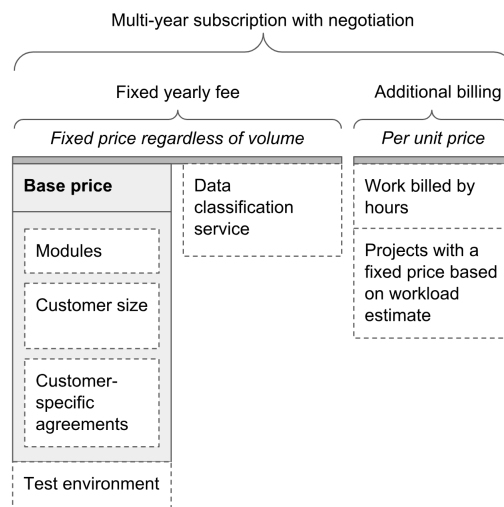
Figure 7: Revenue model of Company C

Company C was using *Bundling and freely chosen amount of some items*, because they did not offer any additional product or service packages, but offered some services individually on a subscription basis. *Unbundling* was used for the additionally billed services.

All the customers were served by three teams: USA, manufacturing, and non-manufacturing. Each team was led by a Key Account Manager, who was responsible for customer satisfaction and additional sales for the customers of that team. The actual team consisted of around 10 technical support specialists. For bigger and more complex customers there was at least one person from the team who knew the environment better than others. However, these persons were not officially designated to those customers.

On top of the yearly fixed fee, Company C offered services with a *Per unit price*. They billed by hour all work that was not related to the Company C's own actions and took over 15 minutes. Larger additional projects could be made with a fixed price that was based on a workload estimate.

5.2.4 Company D

Company D sold only monthly subscriptions with a pricelist. Thus, no customer-specific agreements were made. The pricing formula was *Assured purchase volume + per unit price rate*, meaning that the customers paid either a fixed or a usage-dependent price, depending on the overall volume (Figure 8). Company D offered two separate marketing platforms and an option for managed service, which all were priced similarly. However, the managed service included also the use of the actual platform, which meant that Assured purchase volume + per unit price rate was at most two-dimensional.

Monthly subscription with pricelist

Fixed or usage-dependent monthly fee

One- or two-dimensional assured purchase volume + per unit price rate

Fixed base price for platform 1	Fixed base price for platform 2	Fixed base price managed service
A share of the total spending through the platform that exceeds the base price. The share depends on the total spending.	A share of the total spending through the platform that exceeds the base price. The share depends on the total spending.	A share of the total spending through the platform that exceeds the base price.

Figure 8: Revenue model of Company D

Even though, Company D did not apply tiered pricing, different price levels were included in the subscription fee. The subscription fee was directly tied to the marketing spending through the platform that was categorized into six groups with a varying percentage of the total marketing spending. The share of the marketing spending paid as the subscription fee was 3-5% depending on the total spending after the assured purchase volume was reached. The percentage was lower, the higher the monthly spending was.

Company D did not have any separate service levels or success plans and all services were basically offered for all the customers. Nothing was billed separately. The only exception was the fully managed service, which meant that the customer bought all their social media marketing from Company D including both the use of the platforms and the creation of the actual marketing content. In this case, the customers were not using the software at all. This service was priced similarly as the actual platforms so that there was an assured purchase volume and after that, different percentages of the monthly social media marketing spending. Because all services were offered to all customers similarly, it can be concluded that Company D used *Pure bundling*.

5.2.5 Company E

Company E offered their software with multi-year subscriptions that were negotiated with the customers. The customers paid a fixed yearly fee that consisted of two pricing formulas: *Fixed price regardless of volume* and *Tiered pricing* (Figure 9). According to the interviewee, Fixed price regardless of volume was mainly value-based and the price metrics affecting the fee were the chosen *modules*, the *estimated capacity and performance need*, the *estimated value for the customer based on customer size and industry*, and *customer-specific agreements*. All of these were usage-independent. The value estimation process was quite complex and different parameters related to the customer's size and industry were taken into account. In addition to value, some parameters were related to the estimated capacity and performance needs. Estimated capacity and performance was more cost-based and also formed based on different parameters that were evaluated.

The customers were served by a central support team and had at least one designated Service Manager and Technical Consultant. Additionally, bigger customers had a separate Key Account Manager. The four service levels

differed in the Service Level Agreements (SLAs) that defined, among other things, support availability, response times, and overall service availability. The service levels also included different reserve options like test environment, copying periodically everything from production environment to test, and a separate reserve environment. Individual services were not offered on a subscription basis and, thus, the Company E was using *Bundling and predefined options* in the subscription fee. Moreover, *Unbundling* was used for the additionally billed services.
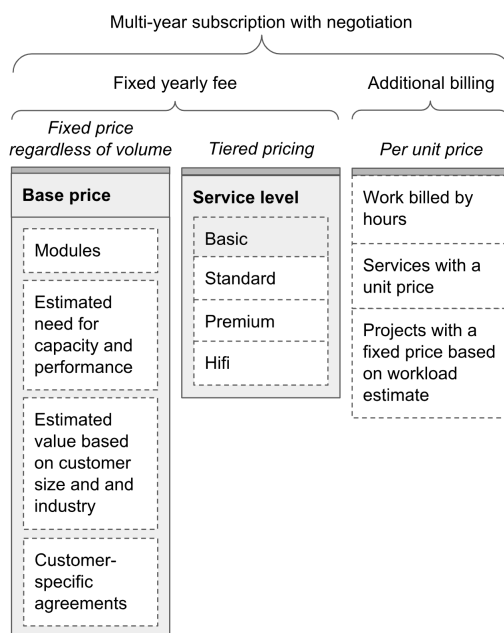
Figure 9: Revenue model of Company E

Apart from the fixed yearly subscription fee, the revenue model of Company E included services that were offered with a *Per unit price*. Company E did a lot of consulting, additional development in customizations, and configuration changes even after the implementation project. Hence, this revenue stream was also significant. Most of the smaller tasks were billed by hour and some common configuration-related services were also provided with unit prices. Moreover, if the customer specifically wanted, larger projects could be done also with a higher fixed price that was based on a workload estimate.

5.2.6   Company F

Company F negotiated multi-year contracts with their customers. The revenue model was quite complex and consisted of a partly usage-dependent yearly fee that was formed with four kinds of pricing formulas: *Fixed price regardless of volume*, *Assured purchase volume + per unit price rate*, *Tiered pricing*, and *Per unit price* (Figure 10). Fixed price regardless of volume consisted of a base price and two price metrics that were the *required complexity in terms of countries and subsidiaries* and *customer-specific agreements*. Both of these were usage-independent. Additionally, the customer could choose related products with similar pricing and separate consulting packages that included a certain amount of consulting per month.

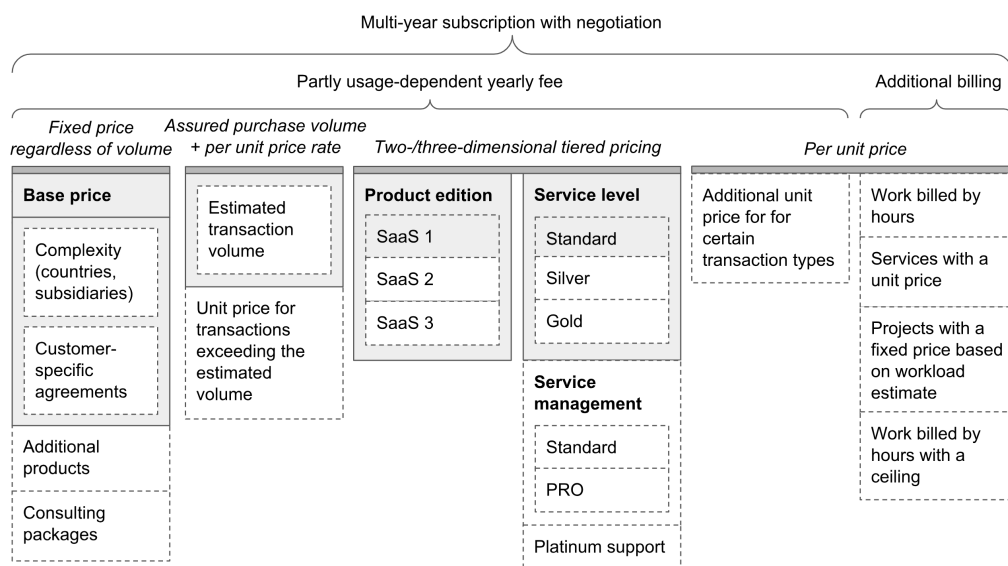Figure 10: Revenue model of Company F

Transaction volume was the only usage-dependent price metric. Assured purchase volume + per unit price rate was formed so that the yearly transactions were estimated a bit too low and then a Per unit price was paid for transactions exceeding the limit. An additional Per unit price was also applied to certain types of transactions like paper bills due to additional costs.

Company F applied to their products two- or three-dimensional *Tiered pricing*. The customer needed to choose between three product editions, three service levels, and an optional service management package with two tiers. The product editions were related to the technical aspects of the software and included, for example, the length of data storing, infrastructure-related SLAs, and different infrastructure-related options. However, the interviewee pointed out that these product editions had been in use already with the traditional licenses before SaaS and now, with cloud-based SaaS, there were not that many infrastructure or technology-related options to choose from. Thus, Company F was considering changes in them.

The three service levels mainly differed in response and resolution times. The service levels were also related to the product editions so that the highest service levels could not be combined with the lowest product editions. In addition, the higher service levels could be combined with separate *Service Management packages*. These included a designated Customer Service Manager as the customer's contact person. The Customer Service Manager offered different kinds of periodic consulting, and the exact tasks and how often they were performed varied between the two service management packages. The customer could also choose *Platinum support* that included, in addition to the highest service level and service management package, a designated technical support team.

Even though the customers could not choose the services included in the different tiers, they could select between some services offered on a subscription basis. Thus, Company F was using *Bundling and both predefined options and freely chosen amount of some items* for their subscription fee. Moreover, *Unbundling* was used for the additionally billed services. These additionally billed services were offered with different Per unit price options, and a majority of them was billed by hour. The other billing options were used only on request.

5.2.7 Company G

Company G negotiated multi-year contracts with their customers. The yearly fee was partly usage dependent and was formed with three pricing formulas: *Fixed price regardless of volume*, *Tiered pricing*, and *Per unit price* (Figure 11). Fixed price regardless of volume was formed of a base price and four usage-independent price metrics. These were the *estimated revenue handled by the software*, the *number of users*, the *estimated data volume*, and *customer-specific agreements*. The customers could also select additional products that were priced similarly. In addition, the customers could choose *Subscription services* that included periodic consulting.
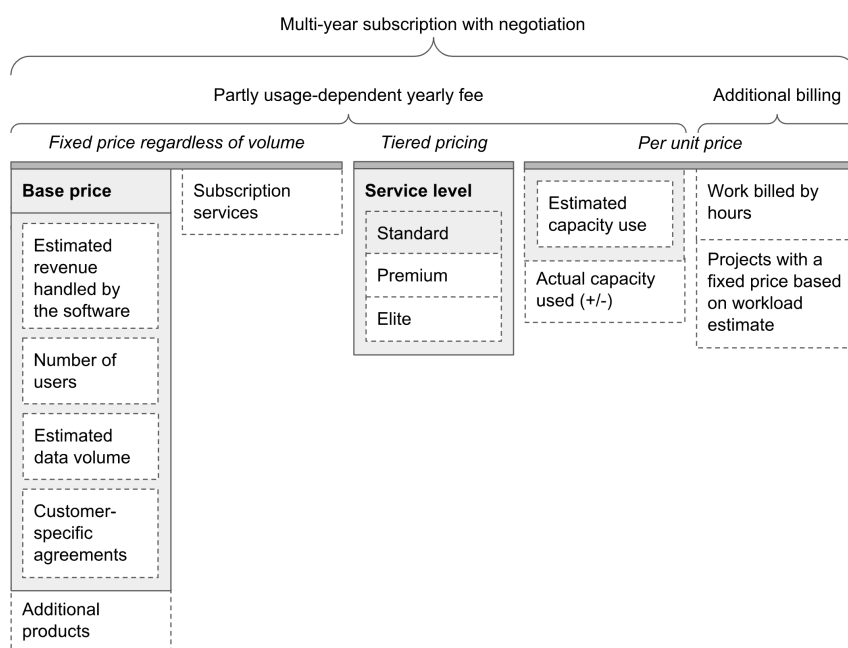

Figure 11: Revenue model of Company G

The Tiered pricing part included three service levels. These differed in the support service hours, number of tickets included, response times, and restoration goals. The selection of the higher service levels increased the overall subscription fee. All the customers, regardless of the service level,

had a designated Support Account Manager and a Customer Success Manager. The Support Account Manager was responsible for all communication towards the customer and solving the customer's technical problems. The Customer Success Manager was responsible for the overall service and customer satisfaction.

Capacity was a usage-dependent price metric and paid with Per unit price. However, the payment for the usage-dependent capacity was made so that an estimation of the capacity was billed one year upfront and later adjusted to match the real capacity used. If it was higher than the original estimate, the exceeding capacity was paid with a Per unit price. Alternatively, if the real capacity use was lower than the estimate, the next year's subscription fee was reduced by the price of the unused capacity.

Because the customers could not choose the services included in the different tiers, but could select also some Subscription services individually, *Bundling and both predefined options and freely chosen amount of some items* was used for their subscription fee. Moreover, *Unbundling* was used for the additionally billed services. These additionally billed services were mainly consultation and training services and charged with Per unit prices. The work was billed by hours or offered as a separate project with a fixed fee based on a workload estimate. However, Company G mentioned that they were trying to reduce additional billing and instead offer more services on a subscription-basis like the recently added Subscription services.

5.2.8 Company H

Company H offered everything with pricelists for smaller customers and negotiated only with the bigger ones. The subscription period was by default one year, but with bigger customers longer contracts were made. The fixed yearly fee included always two-dimensional *Tiered pricing* and optionally services

with a *Fixed price regardless of volume* (Figure 10). The two dimensions of Tiered pricing were the different *Product editions* and three *Success plans.* Product editions differed in technical features, for example the number of users and integration possibilities, and had all a base price. The customers could also choose related products that also had separate product editions. This lead to more dimensions in Tiered pricing. Even though the prices for the product editions were displayed online, the bigger customers could negotiate and *customer-specific agreements* were made. This was also seen as one price metric.
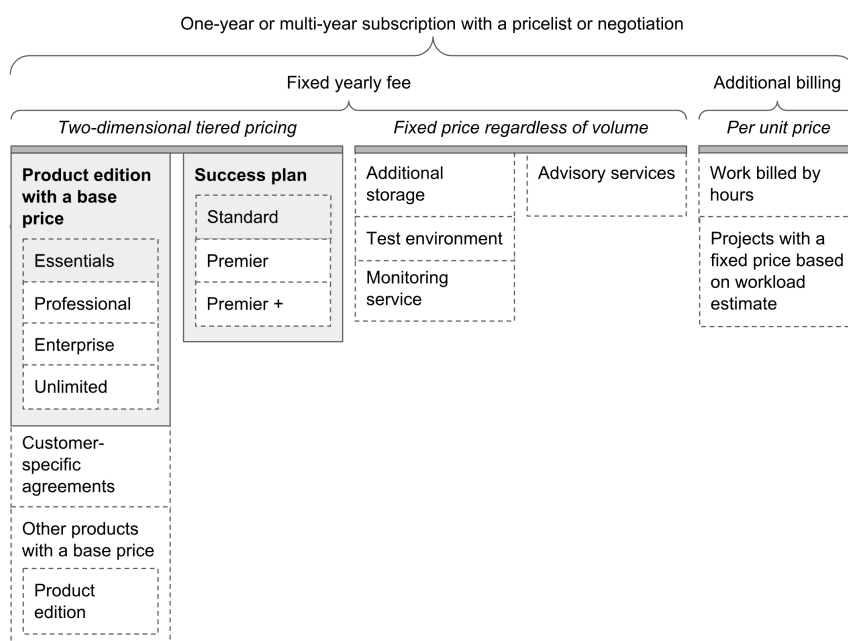
Figure 12: Revenue model of Company H

Standard success plan that covered online case submission for product support during certain support hours was included for all customers. However, this product support was very limited compared to the other case companies. In addition, the standard success plan included basic online training materials. If the *Premier* success plan was chosen, success management, more advanced online trainings, seminars, 24/7 free phone and online support, very short response times for critical issues, and developer support were offered. For

Premier + customers nearly everything from configuration services to tailored training packages were included. The customers also had designated professionals from several teams to assist them.

The Fixed price regardless of volume part of the fixed yearly fee included additional services like *additional storage*, a *test environment*, a *separate monitoring service*, and *advisory services*. The advisory services included the expertise and time of chosen professionals for a short-term project or for several years. These also were seen as usage-independent price metrics.

Company H was using *Bundling and both predefined options and freely chosen amount of some items* in the subscription fee, because the customers could not choose the services included in the different tiers, but could select additional services individually. Moreover, *Unbundling* was used for the additionally billed services. These additional services had a Per unit price and were billed either by hour or as a more expensive fixed price project that was based on a workload estimate. These kind of additional services were mainly sold to the bigger customers.

5.2.9 Comparison of the revenue models

In general, the revenue models of the case companies were very similar at a high level and only Company D had a clearly different model (Table 8). The revenue models of all other companies consisted of a yearly subscription fee and individually billed pay per use -fees. The subscription fee was the main source of income and only some customers were using separately billed services. The majority of the incomes came from the subscription fees even in Company E that was doing a lot of separately billed work. However, the amount of separately billed work varied among the companies and in some of them it was very minimal even though the component was in the revenue model.

The revenue models of the case companies are compared next with the help of the dimensions of the SaaS revenue model framework presented in Section 2.2.2.3. The higher level revenue model characteristics that are Influence, Formula, and Temporal rights, are compared first. Thereafter the lower level revenue model elements including Price bundling, Price discrimination, and Assessment base are summarized.

5.2.9.1 Revenue model characteristics

The high-level characteristics of the revenue models are presented in Table 8. The revenue model characteristics were partly very similar and partly very different across the case companies. While the Temporal rights and Influence dimensions of the revenue models were fairly similar, the Pricing formulas were used very differently by all the case companies.

The Temporal rights and Influence dimensions seemed to be related to the negotiations with the customers. Two out of the eight case companies (A, D) were purely operating with fixed list prices and also did shorter contracts with their customers. The same applied to the smaller customers of Company H that were not negotiated with. All case companies except A and D made customer-specific agreements, meaning that the contract duration, price, and more detailed contents of the agreement were discussed separately with the customers. When the agreements were negotiated, the Temporal rights seemed to always be several years. The exact agreement duration was defined in the negotiations.

Even though the contracts were often made for several years, small usage- or service-related adjustments could be done. For example, if there were separate capacity packages, those could be changed to match the real capacity need also during the contract period. This was, for example, the case in Company B. Also service levels, success plans, product editions, or product features could be often changed on request.

Table 8: High-level characteristics of the revenue models

Company	Temporal rights	Influence	Pricing formulas in the subscription fee	Pricing formulas in additional billing
A	One year	Pricelist	Fixed price regardless of volume / Fixed fee + per unit price, Tiered pricing	Per unit price
B	Multiple years	Negotiation	Fixed price regardless of volume, Two-dimensional tiered pricing	Per unit price
C	Multiple years	Negotiation	Fixed price regardless of volume	Per unit price
D	One month	Pricelist	One-/two-dimensional assured purchase volume + per unit price rate	-
E	Multiple years	Negotiation	Fixed price regardless of volume, Tiered pricing	Per unit price
F	Multiple years	Negotiation	Fixed price regardless of volume, Assured purchase volume + per unit price rate, Two-/three-dimensional tiered pricing, Per unit price	Per unit price
G	Multiple years	Negotiation	Fixed price regardless of volume, Tiered pricing, Per unit price	Per unit price
H	One year or multiple years	Pricelist or negotiation	Two-dimensional tiered pricing, Fixed price regardless of volume	Per unit price

Whether negotiations were held or not seemed to be related to the standardization and business criticality of the software, and the size of the customers. The companies that did not always negotiate (A, D, H) were all offering very standard and quite non-business critical software products. Company A was serving mainly small customers and did not negotiate at all, and Company H did not negotiate with the smaller customers. Company D, in turn, seemed to be an exception, because they also had bigger customers. Negotiations were probably not held, because the revenue model was very simple and mainly usage-dependent. The software usage was also the cheaper the more the customer was using the software. Thus, the pricing formula was by nature favoring the bigger customers.

Most case companies were using several pricing formulas to form their subscriptions fees and only Companies C and D used one pricing formula. Company F had the most complex revenue model and included four pricing formulas in it. A majority of the case companies formed the subscription fee with two pricing formulas.

The most common pricing formulas used in the subscriptions fee were Fixed price regardless of volume and Tiered pricing. Both of these were used by six case companies.Companies B, E, and H were using only these two pricing formulas. Company C, was using only Fixed price regardless of volume, because the customer base was very homogenous and different tiers were not needed. Company D, in turn, had very simple products and had made the decision to serve all the customers equally well and, thus, did not apply Tiered pricing.

It should also be noted that Tiered pricing could be multi-dimensional. Two companies (B, H) were using two-dimensional and one (F) three- or two-dimensional Tiered pricing. In all of these, one of the dimensions was related to product features or capacity, and another dimension to service. The optional third dimension of Company F was an additional level of service.

Company A differed from the other case companies, because it was offering two pricing formula options in parallel. Depending on the customer's selection on how the data was paid, the subscriptions fee either included Fixed price regardless of volume, or usage-dependent Fixed fee + per unit price.

Only three companies (D, F, G) were always using usage-dependent pricing formulas. Company D used Assured purchase volume + per unit price rate, Company F both Assured purchase volume + per unit price rate and Per unit price, and Company G Per unit price. The usage-dependent pricing formulas were related to either the usage of the software or the required capacity. However, none of the companies were using only usage-dependent pricing. Thus, the customers always needed to pay a certain minimum fee.

Additional billing was always carried out with Per unit prices and all other companies than Company D were doing additional billing. Additional services like support requests not included in the selected service level or larger projects were most often billed by hour. The only company that did not bill anything by hour was Company A, because they did not use a time tracking system yet. Some companies also mentioned minimum billing limits. For example, Company C did not bill tasks that required less than 15 minutes and Company B billed always a minimum of 1h. If the billed hours were related to a larger project, a workload estimate was often given.

All companies did projects with a fixed price, if it was specifically requested by the customer. In this case, the fixed price was based on a workload estimate with a security margin so that the overall price was often higher. Additionally, four companies (A, E, G, F) provided some services with a unit price. Per unit rate with a ceiling was only used by Company F.

5.2.9.2   Revenue model elements

The more detailed elements of the revenue models are compared next in two parts. Price bundling is discussed first with the help of Table 9 and after that the Price metrics used in price formation are compared with the help of Table 10. Price discrimination is not discussed separately, because 2nd degree price discrimination was only used with Price bundling.

Price bundling

All case companies were doing Price bundling, because in SaaS the software is by default bundled with some services. Moreover, all companies except Company D, were offering some type of customized bundling. *Bundling and both predefined options and freely chosen amount of some items* was the most common bundling type in the subscription fees and used by four case companies (A, F, G, H).

Table 9: Price bundling in the case companies

Company	Price bundling	Software-related predefined bundles	Service-related predefined bundles
A	Bundling and both predefined options and freely chosen amount of some items, Unbundling in additional billing	-	Success plan (basic, professional, premium) affecting support channels and response times, as well as service-related service components like account management, different people involved, trainings, and consulting
B	Bundling and predefined options, Unbundling in additional billing	Performance and capacity package (small, medium, large) affecting the reserved capacity	Service level (basic, extended) affecting the support priorities and response times
C	Bundling and freely chosen amount of some items, Unbundling in additional billing	-	-
D	Pure bundling, no additional billing	-	-
E	Bundling and predefined options, Unbundling in additional billing	Service level (basic, standard, premium, hifi) affecting the test and reserve environments, support service hours and response times	
F	Bundling and both predefined options and freely chosen amount of some items, Unbundling in additional billing	Product edition (SaaS 1, 2, 3) including the time the data was stored, infrastructure-related SLAs, and different infrastructure-related options	Service level (standard, silver, gold) affecting the response and resolution times, Service management packages (standard, PRO) including different kinds of periodic consulting, account management, and designated people
G	Bundling and both predefined options and freely chosen amount of some items, Unbundling in additional billing	-	Service level (standard, premium, elite) affecting the support availability hours, tickets included, response times, and restoration goals
H	Bundling and both predefined options and freely chosen amount of some items, Unbundling in additional billing	Product edition (Essentials, Professional, Enterprise, Unlimited) differing in the software features, number of users, integration possibilities, and reserved memory	Success plan (standard, premier, premier +) including different support channels, support availability hours, and response times, as well as account management, trainings, people involved, and consulting services

Offering several predefined price bundles was very common and six out of the eight case companies were using predefined bundles for Tiered pricing. Three companies (B, F, H) offered software-related predefined bundles and five companies (A, B, F, G, H) predefined service-related bundles. In addition, Company E offered predefined bundles that were related to both software and service. The only companies that did not offer a selection of predefined bundles were C and D. Instead, Company C was the only company using *Bundling and freely chosen amount of some items* and Company D the only company using *Pure bundling.* If some services were billed separately (all companies except D), *Unbundling* was used for them.

The software-related predefined bundles were very different and included in one company (B) only different amounts of reserved capacity, in one company (F) different infrastructure-related SLAs and infrastructure options, and in one company (H) different product features, differing number of users, and different amounts of reserved memory. In addition, the both software- and service-related bundles of Company E, included from the software-side test and reserve environments.

The service-related bundles were in two companies (A, H) named *Success plans* and in four companies (B, E, F, G) *Service levels.* The lowest Success plan or Service level was included in all subscriptions and only selecting higher Success plans or Service levels increased the subscription fee. Company F was offering *Service management packages* in addition to the Service levels. When the service level of Company F was combined with a Service management package, the combination resembled a Success plan. The only difference to the success plans of Companies A and H was that trainings were not included.

The Service levels seemed to affect the support availability by opening hours, tickets included in the price, support channels, response and resolution times, and overall support priorities. The different Success plans, on the other hand, included in addition to increased support also other service-related service

components like people involved, consulting, and trainings. Additionally, Company, included a few software-related service components in their service levels. The main idea behind the different Service levels and Success plans was to offer different customer segments different services with different prices. Big customers required much more services than small customers and were also ready to pay for them. However, as extensive services as the big customers needed could not be provided to all customers due to the significant additional costs and higher prices that smaller customers could not have paid for.

Company C did not offer any service levels or success plans probably because they had a very homogenous customer base consisting of mainly big companies and, thus, all customers needed very similar services and also had a similar budget. The product of Company C was also non-business critical, meaning that the availability of support and response times were not that critical. Also Company D did not offer any service levels or success plans. The reason could be that their product was non-business critical and included very minimal configurations. Thus, the risks, problems, and resource needs related to it were probably not that big. The company had also made the strategic choice to differentiate from their competitors by offering very good customer service to all their customers.

Two of the companies (A, H) differentiated their service levels by available support channels, three by support availability hours (E, G, H), and all six by response times. The three companies differentiating their service levels by support availability hours (E, G, H), were also the ones offering the most business critical software products. In contrast, the two companies differentiating their service levels by available support channels (A, H), were the only ones offering wider Success plans instead of Service levels. The Success plans of Companies A and H additionally included account management, designated people, trainings and periodic as well as on request consulting.

Price metrics

The price metrics used by the case companies are shown in Table 10. If the price metric was always used in forming the subscription price, it is shown in the table without parentheses. On the contrary, if the price metrics was used only with additional products or optional subscription services, it is shown in the table in parentheses.

All the case companies included either usage-dependent or usage-independent price metrics in their revenue models. While only three companies (D, F, G) were always using usage-dependent metrics and one (A) depending on the customer's preference, seven out of the eight case companies were using usage-dependent price metrics. The only company without any usage-independent metrics was Company D that had also otherwise a very differing revenue model.

Only a few price metrics that were not related to any additional products or services were often used. However, Companies E and G were both using four price metrics that were not related to additional products or services. These two companies were also the ones with the most business-critical software products and quite heterogeneous customer base. Thus, it could be that due to the extensive services they had to provide their very differing customers, they also needed to set the price very carefully.

Companies A, D, F, and G included a usage-dependent part in their subscription fees and, thus, also used usage-dependent price metrics. These metrics were in most cases more related to the value for the customer than the cost of the required capacity. Company A charged of the amount of data used, Company D of the overall marketing spending through the platform, Company F of the transaction volume handled by the software, and Company G the actual capacity used. In addition, Company F used one transaction type as a usage-dependent price metric due to the additional costs related to it.

Table 10: Price metrics in the case companies

Company	Usage-dependent price metrics	Usage-independent price metrics
A	(Data amount)	Data source, (number of users), (data export), (integration interfaces), (all data with a yearly price)
B	-	Number of users, customer-specific agreements, (additional products)
C	-	Modules, customer size, customer-specific agreements, (test environment), (data classification service)
D	Marketing spending through the platform, (Marketing spending through other platforms of services)	-
E	-	Modules, estimated need for capacity and performance, estimated value based on customer size and industry, customer-specific agreements
F	Overall transaction volume, the volume of certain transaction types	Complexity in terms of countries and subsidiaries, customer-specific agreements, (additional products), (platinum support), (consulting packages)
G	Actual capacity used	Estimated revenue handled by the software, estimated data volume, number of users, customer-specific agreements, (additional products), (subscription services)
H	-	(Customer-specific agreements), (additional products), (additional storage), (monitoring service),(test environment), (advisory services)

The usage-independent price metrics that were always used were in all the case companies related to the estimated value for the customer, capacity-related costs, or additional product features. However, distinguishing between the value- and capacity-related price metrics was often challenging, because they were partly overlapping. For example, the number of users, use-related estimations of transactions, and revenue handled by the software, could all relate both to value and capacity needs. The same applied to software modules and data sources. Only customer's turnover and industry (Company E), and customer's complexity in terms of subsidiaries and countries (Company F) were clearly value-related. Purely capacity-related were many usage-dependent price metrics and the capacity estimates of Company E.

The most common usage-independent price metrics that were not related to optional products or services seemed to be product modules or features (A, C, E), number of users (A, B, G), customer size (C, E), and customer-specific agreements (B, C, E, F, G, H). Customer-specific agreements were also regarded as a price metric, because they could affect the price for example based on the contract period and the possibility to use the customer as reference in marketing.

All optional usage-independent price metrics were additional products or services that were offered on a subscription-basis. These included additional products (B, F, G, H), additional storage (H), software-related service components like test environments and monitoring (C, H), and service related service components like consulting and designated people (C, F, G, H). The only company offering an additional service as a usage-dependent price metric was Company D.

Even though the price metrics of the companies seemed to differ quite a lot, the revenue model elements could still be very similar. For example, test environments that were used by Companies C and H as price metrics, were included in the service levels of Company E. Additionally, Company G that did not offer Success plans, offered a very similar service with the service levels and a separate subscription service.

5.3 Service components and revenue models

The third research question of this study, *"How can the service components be included in the revenue models of the B2B SaaS companies?"*, is answered in this section with the help of Table 11. The upper part of the table includes the software-related service components and the lower part of the table the service-related service components.

Most software-related service components were included in all subscriptions without any additional fee. Only Companies C, E, and H were offering software-related service components so that they affected the overall subscription fee. Company E included a test environment and keeping it in sync with the production environment in their service levels. Companies C and H, on the other hand, offered test environments as separate services that increased the overall subscription fee. In addition, Company H offered a separately subscribed monitoring tool for customers' environments.

There were only two separately billed software-related service components. The other one was Customer-specific upgrade testing by the case company that was offered by Companies E and G and the other one was Event, incident and problem management for external cause that was separately billed by Companies B, C, E, and H. Additionally, Companies F and G that also offered this service component, but included it in their basic subscription fee, specifically mentioned that if the workload was very big, it was billed separately and not included in the price.

There were much more service components that affected the subscription fees in the service-related service components than the software-related service components. Companies C and D differed from the other companies, because they did not have any separate service levels or success plans. Thus, all their service-related service components were either offered within all subscriptions or billed separately. Company D's aforementioned strategic choice of focusing on very extensive customer service, can also been seen from this table. All software-related service components that Company D offered were included in the subscription fee without affecting it. The only differences within these service components were that some of them were offered only on request. Company C, on the other hand, billed separately all service-related service components that were not included in the basic subscription fee. These were Technical services, Business services, and Tailored trainings.

Table 11: Service components in the revenue models

Category	Service component	Case company							
		A	B	C	D	E	F	G	H
Maintenance	Hosting and infrastructure	S	S	S	S	S	S	S	S
	Event, incident and problem management for internal cause	S	S	S	S	S	S	S	S
	Event, incident and problem management for external cause		B	B		B	S	S	B
Preventive measures and recovery	Data backups	S	S	S	S	S	S	S	S
	Logging and monitoring customer's environment		S	S		S	S	S	I
	Customer-specific test environment			I		P	S	S	I
	Test environment synced with customer's production environment					P			s
	Reserve options within the software for use during disruptions					S			
	Periodic recovery testing from customer's backups							S	
	Possibility for the customer to download their data backups								S
Upgrades	New versions and releases	S	S	S	S	S	S	S	S
	Customer's test environment upgraded before production					S	S	S	s
	Upgrades coordinated separately with each customer					S		S	
	Customer-specific upgrade testing by the case company					B		B	
Support	Central support/helpdesk	S	S	S	S	S	S	S	P
	Increased support availability (service hours, channels, tickets, response times)	P	P			P	P	P	P
	Business contact person	P			S	S			P
	Technical contact person					S	P	S	P
Technical services	Technical consulting on request	P	B	B	S	B	B	B	P
	Additional customization on request		B	B		B	B	B	P
	Configuration changes on request		B	B		B	B	B	P
Business services	Business consulting on request	P	B	B	S	B	B	B	B
	Periodic business consulting	P			s		I	I	P
Education and training	Online trainings and webinars	S	S	S	S	S	S	S	S
	Training packages	P							P
	Tailored trainings on request	P	B	B	S	B	B	B	B
Overall service management	Account management	S	S	S	S	S	P	S	P
	Periodic review meetings	P		S	s	S	P	S	P
	Periodic overview reports	P		S	s	S	P	S	P
	Incident and problem reports on request			S		S	P	S	P

S = offered to all customers and included in the subscription fee without affecting it

s = offered on request, but included in the subscription fee without affecting it

P = offered in a service package that affects the subscription fee, might be also offered and billed separately

I = offered as an individual subscription service that affects subscription fee, might be also offered and billed separately

B = always offered and billed separately

Companies B, E, and G, offering their customers service levels, are quite similar in the table. These companies included only the service component Increased availability of support (service hours, channels, tickets, response times) in their subscription fees and billed all the other service-related service components that were not offered to all the customers separately. The only exception was Company G that offered Periodic business consulting on a subscription basis.

The rest of the companies (A, F, H) that seemed to include many software-related service components in the subscription fees so that the overall fee was increased, offered their customers success plans or, in Company F, separate service levels and service management packages that together resembled success plans. Company A did not offer any service-related service components that were not included either in all subscriptions or in some of the success plans. The success plans of companies A and H included software-related service components from all categories. Company F, in turn, did not include any service components from the categories Technical services and Education and training in their subscription services. The service component Periodic business consulting from the category Business services was sold separately by Company F as a Consulting package.

There were four kinds of approaches among the case companies to the service-related service components. The first approach was to include all the offered service components in the subscription fee without any effect on the fee. This was the approach Company D was following. The second approach was to not include all service-related service components in the subscription fees and bill all the excluded service component separately. This approach was followed by Company C. The third approach was to offer the customers separate service levels meaning that the only service-related service component that increased the overall subscription fee was *Increased availability of support (service hours, channels, tickets, response times)*. All the rest of the service components were either included in the fee or billed separately. This approach was followed by Companies B, E, and G with the exception that Company G was offering one additional service component as a separate Subscription service. The fourth approach was to offer several service-related service components within different success plans that increased the subscription fee. This approach required a high level of service productization and helped to minimize the amount of separately billed services. This approach was purely followed by Companies A and H, and partly by Company F.

Chapter 6

Discussion and conclusions

This study was conducted as a multiple case study with eight B2B SaaS companies that varied in size, customer base, and product characteristics. The aim was to find out what service components can be offered in B2B SaaS (RQ1), how the service component offering differs in different kinds of companies (RQ1), what kind of revenue models do the companies use (RQ2), and how are the service components included in the revenue models (RQ3).

The results of this study are discussed next and conclusions drawn. After that, theoretical and practical implications are presented. Finally, this study is evaluated, limitations are considered, and directions for future research are provided.

6.1   Service components

A key outcome of this study is the development of a Service component framework for B2B SaaS presented in Table 11. It contains 30 novel service components that are divided into eight categories. Two kinds of service components were also identified: software-related and service-related. The software-related service components (14) were closely related to the maintenance of the software and the service-related (16) could be associated with people and customer service.

Most of the software-related service components were somehow related to preventing disruptions in the use of the software and recovering from them. Thus, it seemed that companies offering business critical software products were also offering more software-related service components. The offering also seemed to be wider, if the software product included customization, because it increases maintenance-related risks. Moreover, serving big customers could also lead into a wider software-related service component offering, because important customers might add risk aversion.

The service-related service component offering, in turn, was mostly related to the productization of the services. All the service components in this category were easy to offer, because they did not require any technical changes. Thus, companies that had either focused on developing their service offering for additional sales and better customer service, or had been "forced" to answer the bigger customers' more demanding needs, had a wider service offering.

Whether the software- or service-related service components were offered to all or some customers, seemed to depend on the costs associated with it, the heterogeneity of the customer base, and the business criticality of the software. Costly service components that for example required additional capacity or human resources, were not offered to all customers unless offering them was needed due to the business criticality of the software. Not offering all the service components to all customers also enabled the company to offer the service at a lower price and serve also customers with less needs and a smaller budget.

6.2 Revenue models

The revenue models of the B2B SaaS companies usually included a yearly subscription fee that consisted of several pricing formulas among them Fixed price regardless of volume and Tiered pricing. There was big variation in the subscription fees and they were sometimes very complex due to multiple pricing formulas, several tiers, and numerous price metrics. In addition to the subscription fee, most B2B SaaS companies offered additional services on a Pay per use -basis with either hourly billing or as fixed priced projects.

Companies offering very standard and non-business critical software products were using pricelists and had shorter subscription periods. All other companies negotiated with their customers and made longer agreements. Bigger customers were almost always negotiated with. A probable reason was that bigger customers had negotiation power and differing needs that had to be taken into account. Moreover, business critical software products were of high importance to the customers and required customizations, both of which gave room for negotiations. Longer contracts were preferred from the providers' side due to the increased stability, and the costs of negotiations.

Tiered pricing was very common and often multi-dimensional, because separate tiers were offered for software functionalities and capacity, and customer service. Different tiers could increase profits, because the customer was forced to switch to another tier, if a certain feature or service was needed. Bundling individual services into tiers also made the revenue models simpler. In addition, tiers were used to serve customers with differing needs and budgets. Especially bigger companies offered individual services on a subscription basis to provide better customer service to their biggest customers and to minimize the effort and costs of billing and negotiations.

None of the revenue models was fully usage-dependent, perhaps due to the aim to ensure a steady level of income. Moreover, it was impossible to measure

the use of a complex and sometimes customized business software with the help of a few parameters. Easily measurable usage-dependent pricing metrics, like capacity or transactions handled by the software, were sometimes used. However, also these were often estimated and billed beforehand and corrected afterwards.

The subscription fee often included a couple of usage-independent price metrics, the most common being product modules, number of users, customer size, and customer-specific agreements. These were used to estimate both the value for the users and capacity-related costs. Most price metrics were used with most business critical software products, possibly because extensive services were needed. Hence, the price had to be set carefully to cover the costs.

6.3   Service components and revenue models

How the service components were included in the revenue models of the case companies is presented in Table 11. The service components were included in the subscription fee for all customers, offered in service bundles or individually so that the subscription fee was increased, or offered and billed separately. Even if a service component was included in the subscription fee for some customers, it could be offered and billed separately for others.

Nearly all software-related service components that were offered, were included in the subscription fees for all customers. The few service components that required more capacity were included in the subscription fee with a price increase, and the few service components with a significant amount of occasional additional work were billed separately.

On the contrary, most of the service-related service components required human resources, had high variable costs, and resulted often in higher subscription fees or additional billing. Companies focusing on excellent customer service, offering more business critical products, or serving only bigger customers, included more services in all subscriptions. Many of the studied companies had not focused on service productization and were offering service components only on request with additional billing. However, especially bigger companies with a heterogeneous customer base were offering optional service components also on a subscription basis. The reason for this was that they were aiming at better customer relations with their most important customers and reducing additional billing that was found problematic.

6.4 Theoretical contribution and implications

The main contributions of this thesis are the development of a Service component framework, eight very detailed depictions of the revenue models of B2B SaaS companies, and a description of how the service components and revenue models can be connected in B2B SaaS. Because no research was found about the service components in SaaS or other contexts, this aspect of the study can be considered very novel. The proposed service component framework can be used to examine SaaS and software maintenance in more detail and as a starting point for future studies on SaaS service components.

Also the research related to SaaS revenue models was limited, using mixed terminology, at a high level, mainly not considering different SaaS types, and lacking wider theoretical frameworks. In addition, detailed case studies paying attention to the context and involving bigger companies were not found. Thus, this study sheds much more light in the revenue models of bigger and more complex B2B SaaS providers. Moreover, this study examines also the company context and depicts the revenue models in great detail as opposed to the few previous studies.

In addition to the two main contributions mentioned above, this thesis provides comprehensive definitions of the related terminology that seemed to be lacking from the SaaS literature. Moreover, an initial step towards theoretical SaaS revenue model frameworks is taken by combining the revenue model related aspects of the pricing models by Laatikainen, Ojala, and Mazhelis (2013) and Lehmann and Buxmann (2009).

An interesting finding was that all the software-related service components offered by all case companies (Hosting and infrastructure, Event, incident and problem management, Data backups, New versions and releases) could specify the responsibilities of SaaS providers that were previously only referred to in the SaaS definitions as maintaining, developing, deploying, and operating the software (see for example Laatikainen and Luoma 2014; Buxmann, Diefenbach, and Hess 2012). Moreover, also the service component offering seemed to differ by the more complex and business critical, and more standard and less critical B2B SaaS types earlier identified by both Benlian, Hess, and Buxmann (2009) and Luoma, Rönkkö, and Tyrväinen (2012).

Surprisingly few service components were in the end removed from the preliminary list of possible service components with many service components derived from ITIL Service Operation. The few service components were removed because they were found to be too wide and unclear. In addition, some related service components offered similarly by all the case companies were combined into one and some split into several. Because these changes were more related to the researcher's interpretations than the original source, it can be concluded that the actions related to the maintenance of SaaS can be very similar to the maintenance of any software. However, as the name Service Operation suggest, ITIL concentrated on the technical side of maintenance and some aspects of the extensive customer service of the SaaS companies could be added to the general service operation practices.

The high-level revenue models seemed be in line with Ojala and Tyrväinen (2012), Buxmann, Diefenbach, and Hess (2012), and Luoma, Rönkkö, and Tyrväinen (2012) who found that B2B SaaS companies often charged recurring subscription fees that were not usage-dependent. The benefits of a steady revenue stream recognized by Ojala and Tyrväinen (2012) also came up in the interviews. Moreover, all case companies except one included additional service-related fees in their revenue models due to the varying costs of the supporting services. This was recognized by Luoma, Rönkkö, and Tyrväinen (2012) as a feature of Enterprise SaaS that all these companies fitted to. These Enterprise SaaS companies also most often negotiated with each customer, which was in line with the previous findings. However, the findings of Laatikainen, Ojala, and Mazhelis (2013) where contrasting probably because mainly smaller SaaS companies without a distinction between B2C and B2B were studied.

The biggest difference to the previous revenue model literature was that no authors mentioned that the subscription fees could include several pricing formulas. For example Laatikainen, Ojala, and Mazhelis (2013) that studied also the pricing formulas within the pricing models, assumed that only one pricing formula was used. Based on this study, most of the B2B SaaS companies include several pricing formulas in their revenue models and also might apply Tiered pricing on several dimensions. Fixed price regardless of volume and Tiered pricing were the most commonly used pricing formulas which was in line with Laatikainen, Ojala, and Mazhelis (2013).

Regarding the lower level elements of the revenue models, the price metrics used by the case companies were mainly usage-independent that was in line with the previous literature (see for example Buxmann, Diefenbach, and Hess 2012; Ojala 2012. The price metrics used by the case companies also corresponded to the price metrics found by Ojala (2012).

6.5   Practical implications

Also the practical implications of this thesis are twofold. First, the service component framework can be used by the companies to identify the service components they are offering. This can help in clarifying the service component offering in the agreements and drawing the line between what is included in the subscription fees and what is billed separately. Thus, the clarification of the service component offering can also help in unifying the customer service towards different customers and the billing practices in general.

Another use for the framework are the points of references from other B2B SaaS companies. Based on the service component offering and the exclusivity of the service components in other companies, a company can get ideas of new services that can be productized and define the service exclusivity based on how the other companies are serving their customers. This can also allow for aforethought differentiation strategies. Additionally, this study provides a lot of contextual information about the case companies that are of different sizes, serve different kinds of customers, and offer different kinds of products. Thus, references can be found, for example, for responding to a change in the company or its business environment.

Even though the revenue models of the case companies varied a lot and were often very complex, they can still be used for benchmarking. It is also possible to compare what kind of approaches the case companies have taken and how they have included certain service components in the revenue models. Also the different kinds of bundles, formulas, and price metrics can provide new ideas and help to develop these aspects in the company's own context. Smaller companies can also compare their often simpler revenue models to those of bigger companies and assess whether the revenue model -related decisions they make now are feasible in the long run. This kind of approach can also help to prevent ending up with very complex revenue models that some of the bigger companies were now simplifying.

To sum up, both the service components and the selected revenue model should be based on a strategic choice that is evaluated from different perspectives. These perspectives can be the costs of the services provided, the needs of different customer segments, the effect on customer service, and possible challenges and costs of additional billing. Clear and well thought service component offering and revenue models can be easy to follow in the company's daily operations and result in happy customers that find and get the services they need.

6.6 Evaluation of the study

According to Yin (2018), the quality of the case study research designs can be judged by using four tests: *construct validity*, *internal validity*, *external validity*, and *reliability*. Construct validity means identifying correct operational measures related to the studied concepts. Internal validity, in turn, includes establishing trustworthy causal relationships that are distinguished from false relationships. External validity means showing the generalizability of the results and reliability that the study study could be repeated with similar results. (Yin 2018)

Construct validity includes defining the key concepts and identifying the suitable metrics for studying the defined concepts (Yin 2018). The construct validity of a case study can also be improved by using multiple sources of evidence and having the key informants to review the draft of the case study report (Yin 2018). The key terms used in this study were defined with the help of the scarce existing literature. The measured metrics were also included in the definitions. Moreover, two sources of evidence, one interview and documentation from public sources, were used for each case company. At least two sources of public documentation were used for each case company. Additionally, private documentation was used from two case companies. The data gathered from a case company was also reviewed twice. First, the

detailed interview notes were sent to the interviewees for checking after the interviews. Second, the draft of the revenue model and the final service component framework with markings of the company's service component offering were sent to the interviewees.

Internal validity is not very significant for this study, because according to Yin (2018), it related only to explanatory or causal studies and not to exploratory or descriptive studies. Even though some ideas of possible causal relationships are suggested in this study, the main focus is on exploring and depicting the studied phenomenon. The studied case companies are also very different in many aspects and, thus, causal relationships are quite impossible to provide.

According to Yin (2018), the external validity of a multiple case study can be increased by using replication logic. Replication logic is similar in individual cases and experiments and the idea is to confirm the findings by using several cases that predict similar or contrasting results (Yin 2018). In this study, only B2B SaaS companies were studied, because they were considered somewhat similar. Contrasting results were preferred and, thus, B2B SaaS companies differing in size, customer base, and product characteristics were selected.

The key for increasing the reliability of a case study is to document the study well (Yin 2018). All material related to the empirical study was documented and organized into several folders. Additionally, the material and methods were described in detail including the research approach, data collection, and data analysis. Even though the detailed interview notes or company names could not be published due to confidentiality issues, the detailed description of data collection and findings should provide enough information for evaluating and repeating the study.

6.7 Limitations of the study

Even though the quality issues presented by Yin (2018) were taken into account, there are still several limitations related to this study. The main limitations of this study are related to the scarce theoretical background and the case study methodology itself.

A significant limitation of this study is that two research questions were related to service components, but no academic research was found about them. Thus, a list of possible service components had to be first developed to be able to evaluate it in the B2B SaaS companies. A preliminary list was derived from a few academic articles mentioning possible service components and an analysis of implied service components in ITIL Service Operation that both involved quite a lot of the researcher's own thinking. Moreover, more service components were based on ITIL, which was related to software maintenance in general and not SaaS. The preliminary list was complemented with a few software-related service components from Company E, and several service-related service components from the pilot company. The pilot company was very small and not offering SaaS. Thus, it is possible that it was not offering as many or the same service components as bigger SaaS companies.

Another limitation related to the service components was that regardless of their role, most interviewees had not been thinking about service components and they were first answering at a very high-level. Hence, most of the discussions about service components were closely related to the list. Thus, some service components might not have come up. In addition, the service component framework was changed radically after the interviews. The modified lists with the researcher's interpretations were sent for the interviewees for checking, but two interviewees never checked the lists. It is also hard to say, if the other interviewees went through the list with a similar level of detail.

There are also limitations that are related to the revenue models due to the limited theoretical background. First, the terminology related to revenue models in the literature was very mixed and often lacking detailed definitions, which made comparing the different studies nearly impossible. Second, very little research was found and many studies seemed to be on a very high-level, did not describe the methodology in detail, used quite limited data, or did not make any difference between the types of SaaS that had been found to influence the revenue models.

Because no frameworks directly related to SaaS revenue models were found, two pricing model frameworks were combined into one. Combining the two models involved a lot of the researcher's own thinking and the resulting framework that was used in this study had not been tested before. Thus, there is no previous evidence that the framework is accurate and actually works in the SaaS context.

Also the case study methodology poses some limitations on this study. First, the findings of this study are based on a relatively low number of case companies that were very different in several aspects and, thus, the possible consequences presented in this thesis should be regarded more as enlightened guesses than proven facts. For the same reason, the new theoretical constructs that were proposed in this study based on the cases and very limited academic research and, thus, should not be generalized. Second, even though supporting documentation was used from all the case companies, a lot of time was spent in the interviews on clarifying the company context and terminology to be able to discuss service components and revenue models. This left less time for in-depth discussions related to the actual topics. Additionally, due to the lack of common terminology, it is possible that still, after clarifications, the final interpretations differed from the actual meaning.

Relying mainly on one person from each company can be considered the third methodology-related limitation of this study. The roles of the interviewees differed a lot, because the companies were asked to suggest a person that

was knowledgeable enough of the topic. The role and background of the interviewee affected the answers and, for example, technical people viewed the topic from a technical perspective, operational level employees did not always have a comprehensive picture of the whole revenue model or different products and operations, and managers were sometimes at a too high level to be able to view the service components in detail. Additionally, both the interviewees and the researcher reflected their own opinions and thoughts. Pricing related information is also somewhat sensitive information for the companies and, thus, every aspect might not have been revealed.

The possible limitations of this study were tried to mitigate with a very careful research design. However, the limitations presented above could not really be avoided, because they were mainly related to the narrow theoretical background and the limited resources and time reserved for this study. Thus, this under-researched topic offers much room for further research to which this study can be used as a starting point.

6.8 Directions for future research

To address the limitations of this study presented above, more studies of both the service components and revenue models of B2B SaaS companies should be conducted. Additional studies with other B2B SaaS companies could help validate the findings of this study as well as further develop the proposed service component framework and depictions of revenue models. To gain the required level of detail, especially qualitative studies are needed.

In addition to validating and generalizing the findings, the causal relationships behind the service components and revenue models should be examined by conducting additional qualitative studies with more similar SaaS companies, differing only in one or two aspects. The studied aspects could be the size and maturity of the SaaS company, the size of the customers, the heterogeneity

of the customer base, the business criticality of the software, and the level of standardization in terms of configuration and customization possibilities.

Another interesting research area would be the evolution of the models. This could reveal both industry trends and causal relationships like the effect of company growth or change in customer base on the service components and revenue models. Interpretive studies could be also conducted with several informants from different companies to reveal why certain service component offerings or revenue models were selected.

A closer look should also be taken at the different service bundles. It seemed that there were significant differences in how the bundles were formed and what was included in them. However, there were not enough resources to study them in more detail within this study. By exploring the product editions, service levels, and success plans, new service components could perhaps be found and more light shed on the more detailed revenue model elements. Additionally, the dividing lines between the different bundles like the number of tickets included in the service level could be revealed. Qualitative studies would be most suitable also for this, because bundles were hard to compare due to very different terminology and the information seems to be rarely available online.

Yet another very interesting area that would deserve more in-depth research is additional billing. Most of the interviewees of this study did not know in much detail what was actually billed separately, because decisions were made often case by case. Thus, it would be extremely interesting to study for example the data stored in the ticket systems, task management, and billing systems and find out what kind of services the customers are actually asking for and what kind of problems the support teams are dealing with. This might also bring up new service components and reveal the services that are not included in the subscription fees.

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Appendix A

Service component framework for interviews

This service component framework was printed out for the interviews and gone through so that in what kind of revenue streams the components were included (if they were offered) was marked on the paper. While going through the framework the service elements and what they were in the company context were also discussed.

Overall service management
- Commercial management: handling agreements and billing, making new proposals and workload estimates
- Resourcing and organizing: making sure that the service is maintained with enough resources length

Maintenance
- Event, incident and problem management (internal or external cause): detecting and analyzing events and incidents and restoring the disrupted services
- Hosting and infrastructure: network, servers and applications management
- Job scheduling: defining and initiating job scheduling software packages to run batch and real-time work

Development
- New releases: smaller bug fixes and product revisions
- New versions: major software upgrades
- Additional software modules: new software modules that are taken to use new software components that are taken to use

Preventive measures and recovery
- Monitoring: active or passive monitoring tools that monitor key configuration items
- Backup: backup (copying) and storage of data in remote locations
- Reserve models: reserve options to be used during disrupted services
- Testing: testing service recovery plans or internal changes (no change request from the customer)
- Restoration: restoration from backup due to loss, corruption or implementation of IT service continuity plans
- Test-/development environment: another instance of the same software for testing and development purposes

User requests
- Contacting support/help desk (phone call, email, web interface): asking a question or making a request
- Single user change requests: small changes that are low risk, frequently performed and low cost like changing a password change, changes to access rights etc.
- Multiple user configuration changes: changes to configurations that affect multiple users
- Scope changes: a request related that affects the assessment base like adding more users, IP addresses, modules etc.
- Additional development and customization: additional customization of the software requested by the customer

Professional services
- User education and training: professional services to provide education and training for the users
- Consulting: professional services to improve e.g. the operations on the customer's side or to help the customer with security audits
- Testing and validation support: helping the customer to test and validate changes

Reporting, documentation and measurements
- Documents and reports: making documents and reports e.g. about incidents and problems
- Meetings: meetings with the customer for reporting purposes
- Documentation: creating internal or external documentation for the customer
- Measurement: measuring customer success e.g. by measuring KPIs and ROI

Appendix B

Interview agenda

Five of the interviews were held in Finnish and one in English. For Finnish interviews a similar interview agenda was used. Before the interview, the research topic, thematic interview methodology and some practicalities, were discussed briefly. Also, a permission for recording the interview, was asked.

Interviewee background

1. What is your current role and responsibility in the organization?

2. How long have you been in the company and in which roles?
   What have you done before?

3. How are you or have been involved in SaaS operations?
   If there are several products, in which of them are you involved in?

Company background

1. Is this company information correct and up-to-date?
   (basic company information that has been found online)

2. Does the company offer only SaaS?
   If not, what else is offered?
   How many of the products are offered as SaaS?
   How important is the SaaS offering compared to other products (share of earnings/customers)?

3. Can you describe the SaaS products of the company.

   What are they used for?

   Are the products similar to each other?

   Do the products consists of several modules?

   Are these modules offered separately or bundled somehow together?

   How many modules are the customers normally using?

   Are the products single-tenancy or multitenancy?

   Are the customers using the same version of the software?

4. What kind of companies are the customers?

   How many customers are using the products?

   Who are the actual users?

   What do the users actually do with the products?

   How business critical is that?

5. Can the SaaS products/services be customized or configured?

   If yes, what is customized and configured?

   Who does the customization and configuration?

   Is there a separate implementation project?

   How long does the implementation project last?

   How is the implementation project priced?

   What is included in the implementation project?

Service components

1. How is SaaS defined in the company context?

   What does it mean?

2. What services / services components are included in SaaS?

3. Are there different service levels or packages?

   What kind of and how do they differ?

   How many customers have approximately chosen each level/package?

Revenue model

1. What kind of revenue streams (fees, charges) are there from the SaaS product?

   How often do the recurring fees occur?

   Are there differences in the fees between the customers?

2. What is included in the different revenue streams?

3. What are the fees based on (Usage-dependent/usage-independent)?

   How are these measured and billed?

4. Are there situation where something is not billed?

   What kind of situations are they?

   What is not billed and why?

   How often do these "exceptions" occur?

Revenue model and service components (Appendix A)

Go through a printed the service component framework shown in Appendix A. Define together what of these service components does the company offer and in what kind revenue models are applied to them. Clarify the service components, if needed and ask for more details. Gather feedback about the list. How is it? Is something missing?

Discussing the revenue model

1. Why is the current revenue model how it is?

   How has it been chosen?

   How has it changed over time and why?

2. How well is the revenue model working?

   What are the pros and cons of the model?

   Why does it suit the company?

   How it could be improved?

3. How do you see the future of the revenue model?

   Does it also work in the future?

   How it might change?

4. Other comments about the revenue model.

Ending

1. Is there still something that should have been discussed or that you want to point out?

2. Do you want to say something about the interview?

   How was the interview?

   How could the interview be improved?

Appendix C

Email template

This is basic email that was sent with small modification either in Finnish or English to the primary contacts from the case companies. Based on this email they decided if they were suitable interviewees themselves or forwarded the email to a more suitable person.

Hi,

I'm contacting you regarding my Master's thesis interviews that CONTACT PERSON might have already mentioned.

As said, I'm currently working on my Master's thesis at the Aalto University School of Science for the Information Networks major. I'm working at Relex Oy and my thesis is about SaaS (Software as a Service) revenue models and service components such as upgrades, backup, and user support. The idea is to study what service components are actually offered with SaaS and what kind of revenue models are related to these services. These can for example help to unify SaaS billing as well as to clarify what services can be offered with SaaS.

Even though I am not interested in the prices or the detailed pricing of SaaS, I understand that any area related to these can be confidential and close to business secrets. Thus, you have naturally the option to not talk about any matters that you regard too confidential. I will also send the interview notes for checking and corrections, offering yet another possibility to check also the

confidentiality issue. The findings will be also presented anonymously in the thesis.

The data for the case study is collected via interviews in 4-6 SaaS companies. Thematic interview methodology is applied, that is, the themes related to the topic are freely discussed without a detailed and pre-defined interview structure. The interview duration will be around 1 hour and it can be held either at your office or at the Aalto campuses in Otaniemi or in Töölö.

Would it be possible to arrange an interview and if yes, what time would be most suitable for you? My own schedule is quite flexible so basically any time will work.

I'm happy to answer all questions and give more information about the study and the interviews.

Thank you already in advance and hoping to hear from you soon!

Kind regards, Johanna Rantanen