Refining Cost Allocation of Professional Services in a Software as a Service Business, Case Company: Leanheat Oy

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Abstract

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This research-based bachelor's thesis, commissioned by Danfoss, investigates cost accounting methods applicable to Software as a Service (SaaS) businesses and assesses their applicability to Leanheat Oy's indirect cost allocation, particularly regarding in-house professional services. By challenging traditional ideas and offering a fresh viewpoint on cost allocation, this research aims to contribute to the ongoing changes in accounting practices for software-based businesses.

The research was conducted through a mix of desktop research and qualitative interviews. Qualitative data was gathered through virtual one-on-one interviews with employees from various financial roles within Leanheat Oy and Danfoss, which ensured a wide range of perspectives. The author's choice of semi-structured interviews and thematic analysis provided meaningful observations of cost accounting methods, challenges in allocating costs, and discussion of factors affecting decision-making in SaaS businesses.

The principles of responsibility accounting and cost accounting methods were studied to explore practices applicable for allocating indirect costs in SaaS businesses, as well as the effects of selected method on the decision-making processes. The characteristics and the distinct cost structure of SaaS businesses were used as a theoretical framework to identify the challenges in allocating costs related to in-house professional services employees to the cost of goods sold (COGS), and the consequent implications on SaaS businesses' financial statements.

The research findings highlight the importance of a tailored cost accounting approach, integrating elements from activity-based costing and time-driven activity-based costing to accommodate to the cost structure of SaaS businesses. By leveraging more advanced cost allocation techniques, Leanheat Oy can gain deeper insights into cost drivers and refine resource and cost allocation. Transparency and flexibility of cost management policies remain significant challenges when considering whether professional services costs can be considered as a part of COGS. Using sophisticated cost accounting methods demonstrates a deeper understanding of cost structures and drivers, allowing decision-makers to better allocate resources, develop pricing strategies, and conduct comprehensive profitability analyses.

The author suggests Leanheat Oy invest in the development of tailored cost allocation guidelines to accurately assign indirect costs to various activities and outputs. The introduction of advanced systems for expense and revenue recognition should be prioritized to streamline workflows. Establishing a clear correlation between costs incurred and revenue generated will refine resource consumption and support sustainable business growth. Continuous review and adjustment of cost accounting practices are recommended to remain updated with industry changes.

Key words
Cost accounting, indirect costs, professional services, Software as a Service, cost of goods sold, financial statements

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1 Introduction

This is a research-based bachelor's thesis for the Degree Programme in International Business Administration at Haaga-Helia University of Applied Sciences, conducted with the direction of finance and accounting. This chapter introduces the topic of cost accounting in Software as a Service business, the background of the topic, the case company, in addition to the research question, objective, and investigative questions. Furthermore, this chapter defines key concepts studied for the thesis.

1.1 Background

As technology continues to shape today's business landscape, organizations must establish accounting frameworks that align with the evolving demands of the digital age. Globally, businesses are increasingly turning to Software as a Service (SaaS) solutions for their scalability, accessibility, and cost-effectiveness. SaaS provides a convenient approach to accessing software applications, eliminating the need for complex installations and ongoing maintenance. The strong demand for simplicity and flexibility from customers is a key factor propelling the growth of the worldwide SaaS market. (Statista 2023.) However, the lack of universally accepted accounting standards for SaaS businesses highlights the critical need for the development of comprehensive guidelines tailored to the unique characteristics of the sector. Unlike traditional business models, SaaS companies operate on subscription-based revenue models, making precise cost allocation essential for profitability and sustainability.

Leanheat Oy (referred to as "Leanheat" hereafter), a subsidiary of Danfoss, specializes in innovative SaaS solutions for optimizing energy consumption and improving indoor climate conditions in buildings. (Leanheat 2023.) Danfoss is a global industry leader in providing energy-efficient solutions, focusing on manufacturing, and supplying products, services, and solutions for cooling, air conditioning, heating, and renewable energy systems. (Danfoss 2023.) This research aims to address the challenges faced by Leanheat and Danfoss in allocating indirect costs with precision and applicability. By refining the understanding of indirect costs in the SaaS industry, this research seeks to facilitate better decision-making processes, resource allocation, and overall operational efficiency. Moreover, by challenging traditional definitions and offering fresh perspectives cost allocation, this research aims to contribute to ongoing transformations in accounting practices, particularly within digital service-based businesses.

The significance of this research extends beyond its immediate impact on Leanheat and Danfoss; it resonates with broader developments in accounting practices within the digital service-based

business landscape. By enhancing the competitive edge of Leanheat, this research also intends to accelerate progress in accounting practices across the entire SaaS industry.

1.2 Research question, objective, and investigative questions

RQ: How can indirect costs associated with professional services be efficiently allocated in SaaS businesses?

RO: This research aims to investigate methodologies for refining the allocation of professional services-related indirect costs in a SaaS business context.

IQ 1. What cost accounting methods are applicable for allocating indirect costs in SaaS businesses?

IQ 2. What challenges arise in allocating costs associated with in-house professional services employees to the cost of goods sold?

IQ 3. How do industry-specific factors affect the allocation of indirect costs for SaaS businesses?

IQ 4. How do different cost accounting methods impact the decision-making process in SaaS businesses?

Table 1 Overlay matrix of the research methods

Investigative questions	**Theoretical framework**	**Methods**	**Interview questions**	**Results**
1. What cost accounting methods are applicable for allocating indirect costs in SaaS businesses?	Responsibility accounting Cost accounting	Qualitative analysis based on the desktop research and interviews analysed thematically	1, 2, 3, 4	2, 4

Investigative questions	Theoretical framework	Methods	Interview questions	Results
2. What challenges arise in allocating costs associated with in-house professional services employees to COGS?	Professional services in SaaS COGS in the context of SaaS	Qualitative interviews analysed thematically	5, 6, 7	4, 5
3. How do industry-specific factors affect the allocation of indirect costs for SaaS businesses?	Software as a Service Professional services in SaaS	Qualitative analysis based on the desktop research and interviews analysed thematically	8, 9	2, 4, 5
4. How do different cost accounting methods impact the decision-making process in SaaS businesses?	Cost accounting Software as a Service	Qualitative analysis based on the desktop research and interviews analysed thematically	10, 11	2, 4

1.3 Demarcation

This research focuses on the challenges and impact of refining the allocation of indirect costs associated with professional services within the context of Leanheat. Professional services roles considered include those in customer support, development, and related areas. Challenges will be examined in terms of workload variability, time tracking, demand fluctuations, and other factors affecting the accurate allocation of costs. This research aims to provide insights into overcoming these

challenges to improve the precision and effectiveness of Leanheat’s indirect cost allocation techniques.

The scope of this research excludes an in-depth analysis of broader financial operations at Leanheat unrelated to cost allocation, as this does not align with the research objective. The scope does not extend to investigating the financial aspects of other SaaS companies that do not face similar challenges. This focused approach aims to provide detailed insights into specific operational challenges relevant to Leanheat, providing practical suggestions and recommendations for financial sustainability.

To achieve its objectives, this research employs a combination of desktop research and qualitative interviews analysed thematically. These methods will be utilized to explore potential ways to mitigate identified challenges. Additionally, practical recommendations will be provided to enhance Leanheat's financial sustainability and competitive positioning through efficient resource allocation, particularly regarding professional services.

Furthermore, this research aligns with sustainability goals by promoting efficient resource allocation practices within Leanheat's operations. By refining the indirect cost allocation of professional services, the research aims to contribute to cost savings and reduce the company's environmental footprint by optimizing resource consumption. Additionally, by promoting a culture of environmental responsibility and corporate social responsibility within Leanheat, the research strives to contribute to broader sustainability goals.

1.4 Benefits

This thesis focuses on highlighting the difficulties of indirect cost allocation, driven by the recognition of a critical gap in traditional costing methods when applied to the dynamic and intangible nature of SaaS businesses. These challenges are particularly relevant to Leanheat, pointing out the limitations of traditional costing methods such as job costing or process costing in accurately capturing the cost structures of SaaS businesses.

This research explores how cost accounting methods used in the SaaS industry can be effectively applied within the context of Leanheat. It seeks to bridge the gap between traditional cost accounting practices and the specific needs of developing and maintaining software. With the shift from tangible to intangible products, understanding how costs are incurred and managed in the SaaS industry is essential.

The primary of this research goal is to deliver a high-quality research-based thesis, contributing to professional development and knowledge in the field. This research aspires to potentially enhance

decision-making processes for Leanheat. Additionally, the goal of the research is to set an example for other SaaS-based subsidiaries of Danfoss by showcasing practical solutions and recommendations tailored to their unique challenges. The proposed methodologies for refining indirect cost allocation can be adapted and implemented by other SaaS subsidiaries, leveraging the expertise and experiences shared in this thesis. This research also aims to contribute meaningful insights to the broader SaaS industry, addressing common challenges and proposing applicable solutions that resonate across various digital service-based businesses. By addressing limitations and challenges encountered during the research process, the thesis aims to provide a comprehensive understanding of the topic and contribute valuable information to the accounting profession.

Overall, the thesis intends to yield practical benefits to both the commissioning company and the author's professional development in the financial field. By offering tangible recommendations and insights obtained from research, this research strives to offer actionable solutions that enhance decision-making processes and financial sustainability for Leanheat.

1.5 Key concepts

Indirect costs refer to expenses incurred in a business' operations that cannot be directly attributed to a particular product, service, or cost object; therefore, they require allocation. (Boyd 2022, chapter 2.) These costs are shared across multiple activities or functions within an organization and can be allocated using methods such as cost allocation bases or cost drivers. Examples of indirect costs include administrative overhead, utilities, depreciation, and certain labour costs that support multiple projects or activities.

Professional services typically refer to an organization of technology and solution experts engaged in delivering technical advisory and implementation services for their customers. (D'Souza, Srinivasan & Smyrl 2022.) Within the context of SaaS businesses professional services offerings may include the onboarding, setup, configuration, and training of customers on the software. The duration of these services can vary widely, ranging from a minimal onboarding process to several months of comprehensive training and continuous optimizing, depending on the complexity of the software sold. Professional services play a central role in enhancing customer satisfaction and strengthening long-term relationships by providing tailored solutions and ongoing support.

Software as a Service (SaaS) is a cloud computing model in which software applications are delivered as a service to the consumer. The consumer configures application-specific parameters and user management, while the service provider handles all infrastructure, application logic, deployments, and product or service delivery. (Kavis 2014, 17-18.) Moreover, the SaaS model offers

scalability and flexibility to businesses, allowing them to adapt to changing market demands and efficiently manage software deployment and updates.

Cost accounting involves the systematic process of measuring, analysing, and reporting both monetary and non-monetary details concerning the costs associated with acquiring or utilizing resources within an organization. Cost accounting serves the informational needs of professionals in both financial accounting and management accounting. In present-day accounting practices, many professionals view cost information as a fundamental component of the data collected for managerial decision-making, blurring the distinction between cost accounting and management accounting. (Horngren, Datar, Rajan 2014, 26.) Cost accounting is used for all types of businesses, as it is considered to capture the costs of production, whether a business delivers services, engages in retail sales, or manufactures products. (Boyd 2022, chapter 1.)

Cost of goods sold (COGS) refers to the direct expenses incurred by a business in producing or manufacturing the goods or services it sells. COGS is an important component in determining a business's gross profit, calculated by subtracting COGS from total revenue. (Corporate Finance Institute 2024.) It provides insight into the operational efficiency and profitability of a business's core activities. Additionally, understanding COGS allows businesses to assess the profitability of individual products or services, aiding in pricing strategies and decision-making.

Financial statements including the profit & loss statement, balance sheet, and cash flow statement, provide comprehensive information about a company's financial position, performance, and cash flows. (Elliott & Elliott 2017, 21.) These statements are closely related to COGS and provide meaningful insights into a company's financial health and performance. Furthermore, financial statements play an important role in fostering transparency and accountability within organizations, serving as essential tools for investors, creditors, and other stakeholders to evaluate the financial health and performance of a company.

1.6 Commissioning company

The commissioning company, Danfoss, stands as a global industry leader in energy-efficient solutions. Established in 1933, Danfoss boasts a long history within innovation and engineering, employing approximately 42,000 individuals worldwide. (Danfoss 2023.) Headquartered in Nordborg, Denmark, Danfoss maintains a presence in over 100 countries. Within Danfoss, the focus of this thesis focuses on its subsidiary, Leanheat, a prominent player in Danfoss' digital services portfolio originating from Finland. In 2016, Danfoss partnered with and invested in Leanheat, and in 2018 Leanheat became wholly owned by Danfoss. (Leanheat 2019.)

Leanheat pioneers AI-driven solutions tailored to optimize energy consumption and enhance indoor climate conditions in buildings. As of 2022, Leanheat boasted a workforce of 44 employees and achieved a turnover of 5.9 million euros. (Asiakastieto 2024.) This research aims to enhance Leanheat's comprehension of its financial operations, particularly regarding refining the allocation of indirect costs. The thesis topic is commissioned by Natalie Schnippering, Head of Digital Services at Danfoss.

1.7 International aspect

The international aspect of this research is evident, reflecting the global nature of the commissioning company, Danfoss, and its subsidiary, Leanheat. Leanheat’s operations extend beyond the Finnish market, influencing and contributing to diversity in international markets. Currently, Leanheat’s SaaS solutions are available in Sweden, Denmark, Germany, Estonia, Italy, and Poland. The SaaS model is global by nature, allowing businesses to provide scalable and accessible solutions worldwide. The availability of Leanheat's services across various business environments emphasizes the broad applicability of its AI-driven solutions on an international scale.

2 Theoretical framework

This chapter seeks to deliver a comprehensive exploration of key concepts relevant to understanding indirect cost allocation in a SaaS business, specifically addressing in-house professional services. Gathering insights from existing literature, the theoretical framework examined includes topics such as responsibility accounting, cost accounting methods, and the unique characteristics of SaaS businesses.

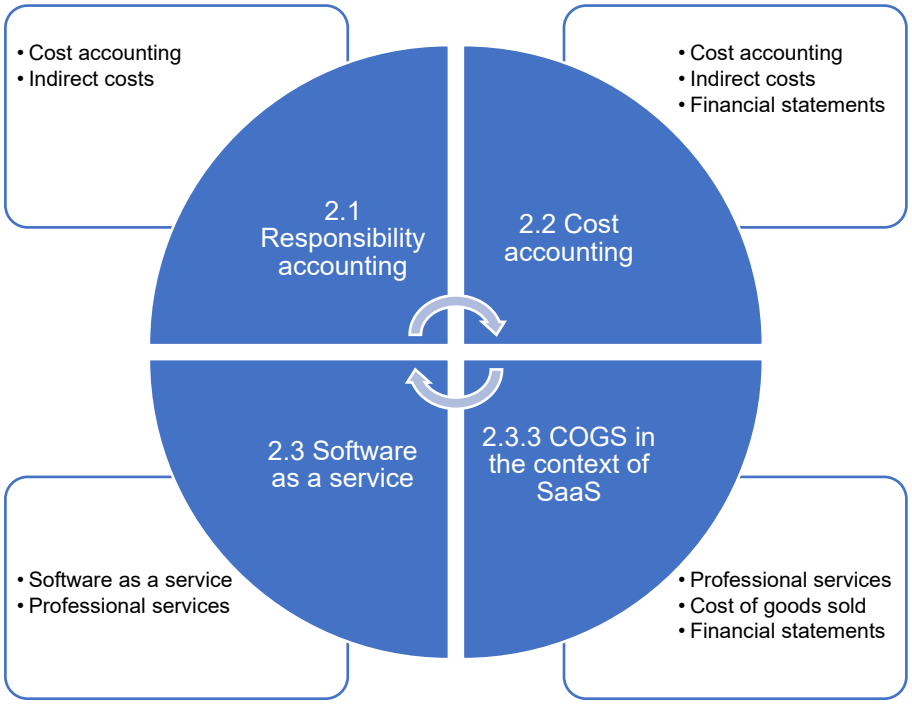

Figure 1 Conceptual framework of the relationship between the key concepts

2.1 Responsibility accounting

In today's advanced business environment, achieving centralized control poses increasing challenges due to the complexity of organizational operations. As Drury (2018, 409) points out, central management often struggles with accessing all relevant information and allocating sufficient time to formulate detailed plans for the entire organization. This requires the adoption of alternative management approaches, such as responsibility accounting, which serves as a valuable tool in evaluating performance and guiding decisions related to cost control and profit planning.

According to Drury (2018), responsibility accounting operates on the principle that each organizational unit or manager holds authority and accountability over designated resources, known as responsibility centers. Responsibility accounting involves assigning budgets and standards to each center, allowing for the comparison of actual results with planned ones, identifying variances, and

enabling corrective actions. In the context of SaaS businesses, responsibility accounting ensures that each department or team understands its role in achieving organizational goals, particularly in terms of cost control and profit planning.

2.1.1 Responsibility centers

Drury (2018, 410) categorizes responsibility centers into four distinct types: cost centers, revenue centers, profit centers, and investment centers, each characterized by unique performance metrics. Miller-Nobles and Mattison (2022) define responsibility centers as a part of the organization for which a manager has decision-making authority and accountability for the results of those decisions. The concept of responsibility centers is key in responsibility accounting, as it enables organizations to decentralize decision-making, allowing managers to have control over their designated areas and be responsible for achieving set objectives.

In a cost center, managers are solely responsible for controlling costs. Mukhopadhyay (2024) defines a cost center as a department tasked with the responsibility of minimizing the organization's costs by examining processes and implementing necessary modifications. Similarly, in a revenue center, the manager’s only responsibility is financial outputs in the form of revenue generation. However, Drury (2018) notes that managers of revenue centers may also be held accountable for selling expenses, but they are not made responsible for the cost of the goods and services sold.

In a profit center, the manager has a combined responsibility over revenue generation and cost controlling, therefore also being responsible for producing profits. (Miller-Nobles & Mattison 2022, 495.) Lastly, in an investment center, the manager’s responsibility lies in profit generation and efficient management of invested capital. Investment centers represent the top level of managerial autonomy and encompass the entirety of the company, along with its operating subsidiaries, various business units, and divisions. (Drury 2018, 411.) Below is a table summarizing the manager’s responsibilities within each responsibility center, and their reports.

Table 2 Responsibility centers adapted from Miller-Nobles & Mattison 2022, 495.

Responsibility center	**Manager’s responsibility**	**Responsibility report**
Cost center	Cost controlling	Comparison of actual costs vs. budgeted costs
Revenue center	Revenue generation	Comparison of actual revenue vs. budgeted revenue

Responsibility center	Manager's responsibility	Responsibility report
Profit center	Producing profits through generating revenues and controlling costs	Comparison of actual revenue & costs vs. budgeted revenue & costs
Investment center	Producing profits and efficiently managing the centre's invested capital	Comparison of actual profits vs. budgeted profits and measures return on investment (ROI) & residual income

2.1.2 Components of responsibility accounting

WallStreetMojo (2024), a team specializing in finance and accounting backed by research and facts, outlines the five components of responsibility accounting essential for efficient implementation:

1. **Inputs and outputs.** Responsibility accounting relies on accurate input and output data, such as raw material quantities and labour hours as inputs and finished products generated as outputs. Cost and revenue data are important monetary terms associated with these inputs and outputs.
2. **Identification of responsibility centers.** The foundation of responsibility accounting lies in identifying responsibility centers, which represent organizational decision points. Clear recognition of these centers is important for the comprehensive implementation of the responsibility accounting system.
3. **Target and actual information.** Timely reporting of any deviation from the plan is essential. Target and actual performance data play a central role in evaluating the performance of responsibility centers and serve as the foundation for performance reports.
4. **Responsibility between organizational structure and center.** A well-defined organizational structure is a prerequisite for assigning responsibility effectively. The success of the responsibility accounting system relies on clear lines of authority within the existing organizational structure.
5. **Assigning cost and revenue to an individual.** Success in implementing this accounting system requires the assignment of cost and revenue to an individual responsible for the designated responsibility center. Planned and actual financial data, along with effective budgeting, communicate the accounting plan implementation to relevant management levels.

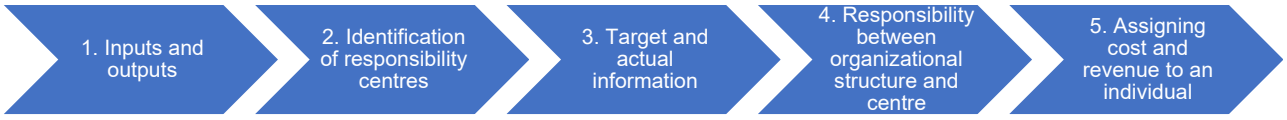

Figure 2 Components of responsibility accounting adapted from WallStreetMojo 2024.

The benefits of responsibility accounting include motivating managers, improving efficiency, enhancing communication, and facilitating decision-making with relevant information. However, challenges include the need for clear cost and revenue allocation, dependence on accurate data, and potential conflicts among units or managers with differing goals. Additionally, responsibility accounting may not account for external factors influencing center performance, such as market conditions or regulations.

2.1.3 Responsibility reports

Responsibility reports serve as comprehensive performance summaries that capture the financial performance of cost, revenue, and profit centers, emphasizing responsibility and control. (Miller-Nobles & Mattison 2022, 511.) These reports inform responsibility center managers about deviations from budgets for which they are liable, prompting them to take necessary actions. A distinctive aspect of responsibility reports is their emphasis on responsibility and controllability. Notably, responsibility reports prioritize aspects within the manager's area of influence, refraining from evaluating factors beyond their control, thus emphasizing the principles of responsibility and controllability.

To summarize, irrespective of the responsibility center type, the emphasis in responsibility reports should be on providing information rather than assigning blame. The analysis of budget variances serves to enlighten managers about the underlying factors influencing the unit’s performance. Equipped with this understanding, managers can implement corrective measures. It is essential to acknowledge that certain variances are beyond managerial control, and holding managers accountable for uncontrollable conditions is inappropriate. (Miller-Nobles & Mattison 2022, 506.) Responsibility accounting becomes a valuable tool for managers in discerning the origins of variances, enabling them to distinguish between factors within and outside their control.

2.2 Cost accounting

This chapter involves exploring cost accounting methods that could be applied within the unique context of SaaS businesses. According to Miller-Nobles & Mattison (2022), cost accounting is

concerned with cost accumulation for inventory valuation to meet the requirements of external reporting and internal profit measurement.

Cost accounting serves as a valuable resource for professionals in both management accounting and financial accounting. It involves the systematic process of measuring, analysing, and reporting financial and nonfinancial data related to the costs associated with acquiring or utilizing resources within an organization. (Horngren & al. 2014.) Cost accounting and cost management have three distinctive features: (1) calculating the cost of cost objects, such as products and services; (2) gathering information for planning, controlling, and performance evaluation; and (3) analysing the information relevant for decision-making.

According to Miller-Nobles & Mattison (2022), a cost and management accounting system is expected to produce information to fulfil the following criteria. It should:

- distribute costs between cost of goods sold and inventories for both internal and external profit reporting purposes
- provide relevant information to assist managers in better decision-making
- provide information relevant for planning, controlling, performance measurement and continuous improvement.

Cost accounting systems are the techniques used to determine the cost of a product or service by collecting and classifying costs and assigning them to cost objects. (Horngren & al. 2014.) The objective of a cost accounting system is to quantify the expenses associated with the creation, development, production, marketing, distribution, and maintenance of specific products or services. Cost allocation is a central component of most cost accounting systems.

2.2.1 Activity-based costing

Activity-based costing (ABC) is a valuable tool for enhancing a costing system. It does this by recognizing specific activities as the key cost drivers. The process involves identifying the costs associated with certain activities to establish a foundation for allocating indirect costs to services and products. (Miller-Nobles & Mattison 2022.) An activity is essentially an action or task that serves a specific purpose within the organization. (Horngren & al. 2014, 180.) ABC was first developed and clearly defined by Robert Kaplan and Robin Cooper in 1987. ABC methods aid in strategic decision-making by identifying activities across all functions of the value chain, determining the costs associated with each activity, and allocating these costs to products and services based on the combination of activities necessary for their production. In the context of this research, ABC serves as a valuable tool for practically allocating costs associated with professional services employees in SaaS businesses.

According to Blocher, Stout & Cokins (2010) establishing an activity-based costing system involves three stages: (1) identifying resource costs and activities, (2) assigning resource costs to activities, and (3) assigning activity costs to cost objects. However, Kaplan's & Cooper's method consists of four steps: (1) identifying and classifying activities related to the products, (2) estimating the cost of the activities, (3) calculating a cost-driver rate for the activity, and finally (4) assigning activity costs to the products. (Kaplan & Anderson 2007.)

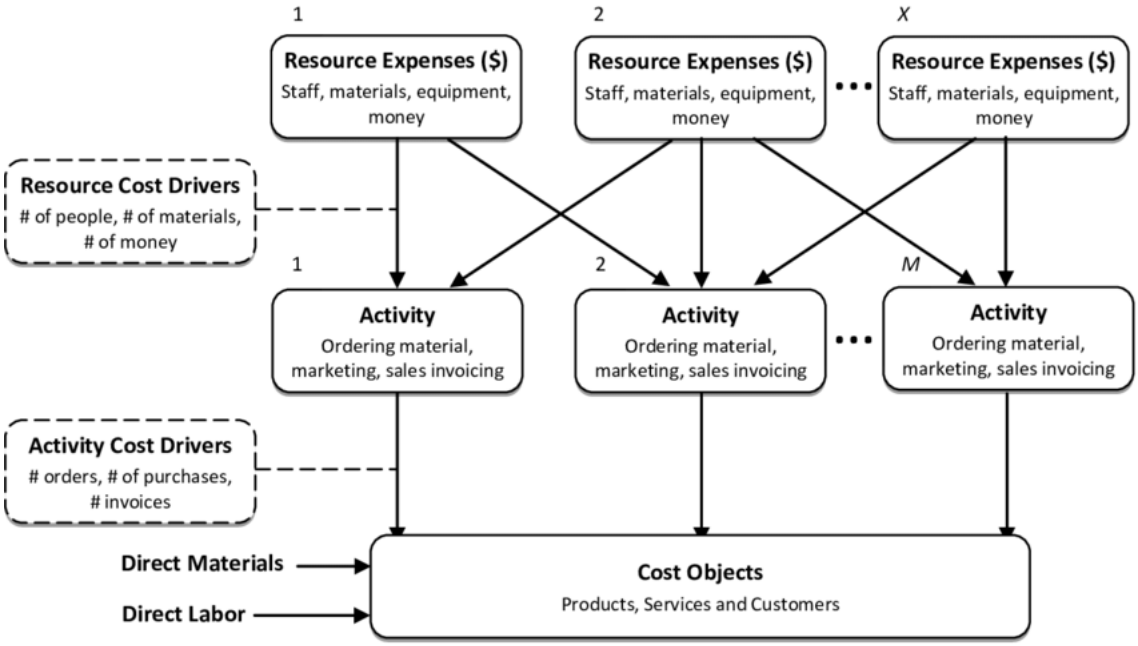

Figure 3 Activity-Based Costing flowchart (Kaplan & Cooper, 1998)

An activity refers to a specific task or work action, which can range from a single action to a series of actions. Resources are economic components required in performing activities, such as salaries and supplies. A cost driver is a factor influencing a change in activity costs and can be either a resource consumption cost driver or an activity consumption cost driver. The former measures the resources consumed by an activity, while the latter determines the amount of activity performed for a cost object, facilitating the allocation of activity costs to cost objects.

Blocher & al. (2010) summarize the benefits of ABC into five points. Firstly, ABC facilitates more precise and insightful product cost calculations, allowing informed decisions on pricing, product portfolios, and target markets, ultimately improving profitability measures. The second benefit is providing accurate assessments of activity-driven costs, enabling managers to optimize product design, enhance customer support strategies, and initiate projects that add value, leading to better decision-making. Thirdly, ABC provides information to pinpoint areas in need of process improvement. The fourth benefit is improving product costs that result in more reliable job cost estimates, aid in pricing decisions, budgeting, and planning. Lastly, ABC systems offer better insights into the

costs associated with unused capacity, allowing for separate accounting and strategic charging for additional capacity, reducing underutilization costs, and ensuring proper product and service pricing.

Activity-based accounting systems have the capability to convert indirect manufacturing overhead costs into direct costs, aligning them specifically with designated cost objectives. By strategically choosing activities and cost drivers, managers can attribute manufacturing overhead costs to cost objectives with a level of specificity comparable to direct material and labour costs. (Horngren & al. 2014.) This instils greater confidence in the accuracy of reported product and service costs compared to traditional systems.

Although more complex to implement than traditional systems, an increasing number of organizations in both manufacturing and non-manufacturing sectors are embracing activity-based systems for their ability to provide more nuanced and accurate cost allocations. While ABC offers benefits such as improved product cost calculations and better insights into unused capacity costs, it also has limitations, including the complexity of implementation and potential challenges in accurately identifying cost drivers.

2.2.2 Time-driven activity-based costing

Time-driven activity-based costing (TDABC) is an extension of ABC discussed in the previous subchapter. This method directly allocates resource costs to cost objects based on the cost per time unit of providing the resource. This method skips the intermediate step of assigning costs to activities before linking them to cost objects. (Blocher & al. 2010, 153.) In comparison with a traditional ABC method, TDABC calculates costs based on time taken for each activity, which results in a more precise reflection of the cost of services provided. (Hoojier 2023.)

Kaplan & Anderson’s (2007) approach of TDABC simplifies the costing process by eliminating the need to interview employees for allocating resource costs to activities before driving them down to cost objects. This new and improved version of the traditional ABC method assigns resource costs directly to the cost objects. The time-driven approach uses time equations that directly and automatically assign resource costs to the activities performed and transactions processed. Only two parameters need to be estimated: the capacity cost rate for the department and the capacity usage by each transaction processed in the department.

The TDABC method accommodates variations in the time demands made by different types of transactions allowing the unit time estimates to vary based on order and activity characteristics. (Kaplan & Anderson 2007.) According to Hoojier (2023), time management is the core of TDABC and for organizations to develop a detailed understanding of the time-driven cost structure within

their processes they must focus on three components: (1) estimating time durations for activities, (2) adjusting time estimates as per variability in customer demand and activity complexity, and (3) calculating costs based on the time-based utilization of resources.

Kaplan & Anderson (2007) argue that the TDABC approach overcomes challenges associated with traditional methods and offers numerous advantages. It facilitates the swift and efficient construction of accurate models, integrates seamlessly with data from ERP and customer relationship management systems, and allocates costs based on specific characteristics of transactions, processes, suppliers, and customers. TDABC can be implemented monthly to reflect recent operations, providing visibility into process efficiencies and capacity utilization. It aids in forecasting resource demands, allowing for budgeting based on predicted order quantities and complexity.

The approach is easily scalable for enterprise-wide models and ensures fast, inexpensive model maintenance. Additionally, TDABC supplies granular information for identifying the root causes of problems. It applies to various industries and companies with complexity in customers, products, channels, segments, processes, and substantial people and capital expenditures. This makes it a suitable approach for SaaS businesses such as Leanheat. To conclude, TDABC offers a modern and precise approach to cost management and strategic financial planning.

2.3 Software as a Service

The Software as a Service market is projected to be globally valued at around 197 billion U.S. dollars in 2023, with an anticipated increase to 232 billion U.S. dollars by 2024. (Gartner 2023.) SaaS applications, operating in the cloud, are typically accessible through desktops, mobile applications, and web interfaces. In this chapter, the definition and characteristics of the SaaS business model are discussed. The subchapters explore the role of professional services in a SaaS business as well as the definition of the cost of goods sold.

2.3.1 Definition and characteristics

As businesses transition their data, applications, and platforms to the cloud, software traditionally installed on a customer's local servers is now frequently hosted on the vendor's servers, accessible remotely by the customer. These arrangements are commonly referred to as hosting arrangements or cloud computing arrangements (CCAs). Examples of CCAs encompass software as a service (SaaS) and other "as-a-service" models, such as Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). (PwC 2021.)

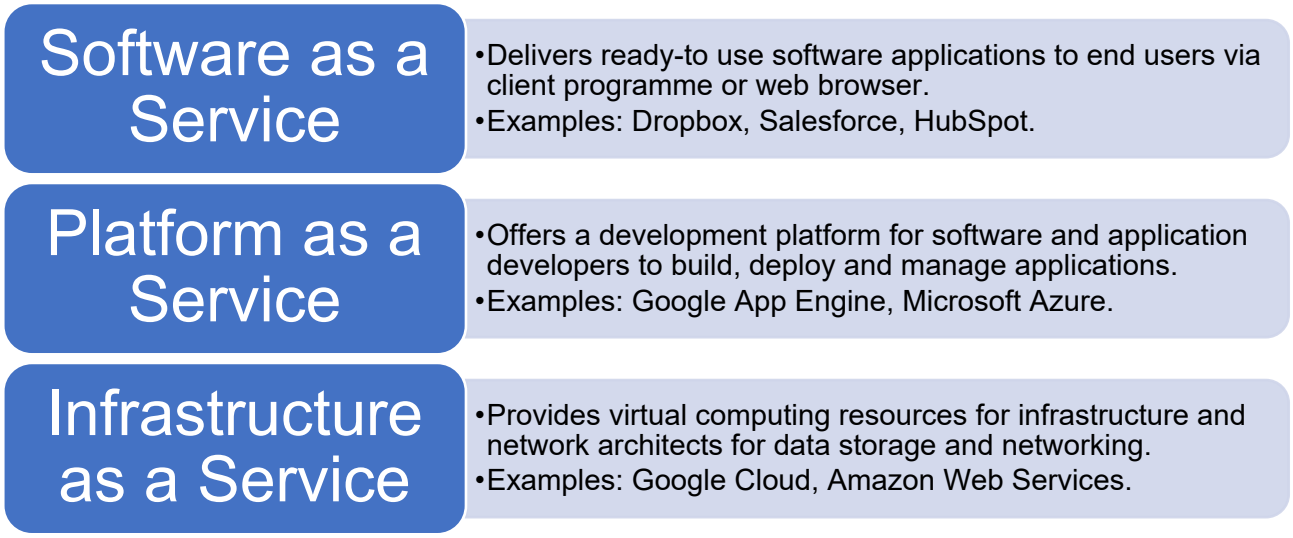

Figure 4 Cloud service models distinguished with examples adapted from Shaikh 2024.

In the SaaS model, vendors offer customers access to application software and databases through the cloud. The intricacies of infrastructure, platforms, and software details are hidden from customers, who connect to the service through a client program or web browser. Customers are relieved from hardware maintenance responsibilities. The software provider, often working with an independent vendor, hosts the application and manages data on its servers. Users pay a flexible, scalable per-user or per-use fee for ongoing access to the latest software version. This model allows easy user additions or removals, eliminating the need for customers to invest in new platforms, infrastructure, and software licenses. (Statista 2024.)

SaaS companies have many of the same expenses as any business, plus some expenses unique to cloud-based organizations. These specific expenses may include costs associated with server maintenance, data security measures, continuous software updates, and investments in cutting-edge technologies to ensure the seamless delivery and performance of their services over the cloud. SaaS companies must manage both regular and unique expenses carefully. This helps ensure accurate financial reporting and effective financial planning.

Figure 5 Types of common SaaS costs

Below is a breakdown of four common cost categories presented in the figure above:

1. General & administrative expenses consist of regular day-to-day operating costs of running the SaaS business. These expenses are not directly related to producing a good or service, but they are required to keep the business running. Fixed costs such as office space rent, utilities, and payroll fall under this category.
2. Sales & marketing expenses include digital and non-digital advertising costs, public relations costs, and customer-facing website expenses, for example. Payroll for sales and marketing employees should be included in this category.
3. Research & development expenses are often a large part of a SaaS business' total costs, especially in the early stages. Engineering team's salaries, cost of licensing software and costs incurred from developing the software are included in this category.
4. Cost of goods sold (COGS) are allocated to direct expenses essential for delivering the SaaS solution. A detailed breakdown of what COGS encompass in a SaaS context will be discussed further in this research.

2.3.2 Professional services in SaaS

The growth path of a SaaS company significantly relies on professional services, as they perform a primary function in fulfilling sales commitments and aiding customers in extracting value from their investments. In the case of non-plug-and-play SaaS products, incorporating professional services becomes essential to accommodate the needs of different customers. Additionally, these services assist customers in navigating challenges related to change management and adoption. In Deloitte's publication on the role of professional services D'Souza & al. (2022) conclude that as

companies shift to cloud-delivered SaaS and consumption-based models, they increasingly have an opportunity to evolve the role professional services play to meet emerging customer needs.

Professional services can directly influence numerous factors and drivers within the SaaS business model. According to Stolle (2018), the key drivers of having a professional services team are:

1. **Customer success**. When customers encounter challenges implementing the product or service or fail to derive significant value from it, they will not become advocates. This dissatisfaction is reflected in low Net Promoter Scores (NPS), unfavourable analyst reviews, and limited word-of-mouth lead generation. Building a reference base and significant customer success case studies becomes exceptionally challenging without professional services.
2. **Customer retention**. If customers are leaving almost as quickly as new ones are coming in, building an efficient revenue model becomes impossible, regardless of a robust sales engine. Excessive capital burn relative to generated revenue poses a threat to future funding, making any secured funding more expensive and diluting founder and employee ownership.
3. **Expansion uptake**. The "Land and Expand" strategy becomes unviable if customers reject your offering before establishing a value-based starting point. The “Land and Expand” strategy involves initially acquiring a customer (landing) with a relatively small-scale or entry-level offering and then expanding the relationship by upselling additional products, features, or services over time.
4. **Net churn.** This SaaS business metric emphasizes the importance of having a net revenue expansion from existing customers to achieve the growth and scale required to attract serious investor attention, which is where professional services step in.

Thompson (2022) summarizes that professional services benefit a SaaS company’s ability to retain customers and drive expansion opportunities.

According to a survey conducted by Deloitte in 2022, gross margins on professional services vary widely. This variation is attributed to factors such as the strategic significance of professional services, pricing structures, discounting models, and the associated labour costs for service delivery. The vast range in gross margins reflects the evolving role of professional services within SaaS businesses.

Traditional companies continue to perceive professional services as a means to enhance overall profitability on the profit & loss statement. In contrast, numerous established SaaS companies are open to temporarily sacrificing gross margins to foster growth in product annual recurring revenue. (D’Souza & al. 2022.) Murray (2023) adds, that although maximizing annual recurring revenue is a

strong focus of SaaS businesses, the role of professional services is significant in forming successful relationship with customers.

Cost drivers for professional services can vary depending on the nature of the service and the industry. According to Horngren & al. (2014) a cost driver is a variable, such as the level of activity or volume that affects costs over a given period. The complexity of a SaaS business correlates with the expertise of professional services employees, with higher salaries impacting the overall cost structure.

2.3.3 COGS in the context of SaaS

Dickinson (2023) states COGS include the direct expenses associated with delivering a software service to customers, including hosting costs, third-party service fees, and direct support costs. Buckley (2023) adds, that in the context of a SaaS company COGS refers to the direct costs incurred when building and running subscription-based software services. Unfortunately, there is no Generally Accepted Accounting Principle (GAAP) for calculating COGS in SaaS, therefore every company calculates it using their judgement on what should be included.

According to Software Equity Group (2023), a mergers and acquisitions advisory firm for software companies, the common COGS line items for software companies include:

1. Hosting expenses to deliver the actual software.
2. Costs for third-party software that is part of the product delivered to customers.
3. Personnel costs for development and operations (DevOps) employees, the professional services team, and the customer support team.

Lucas (2023) has also specifically defined that direct employee costs required to deliver the ongoing service should be considered COGS in a SaaS company.

Gross margin, a primary indicator of a company’s profitability, is determined by COGS. Low COGS in comparison to revenue signifies operational efficiency and a scalable business model. Precise forecasting is necessary for accurately projecting profitability. Buckley (2023) argues that many SaaS companies are unsure of what to include in their COGS, leading to inaccurate financial reports. COGS reflect how much a business spends on building and supporting the software services that customers purchase.

Operating expenses are the costs incurred during day-to-day operations of the business, such as salaries, sales, marketing, rent, and other general overhead costs. Operating expenses have a direct impact on the operating margin, influencing the overall profitability of the company. As opposed to COGS, operating expenses represent the costs incurred to run and support the entire

business, not just the software-enabled services a business provides. (Buckley 2023.) Careful monitoring of these costs is essential to uphold business efficiency and maintain a lean operational structure.

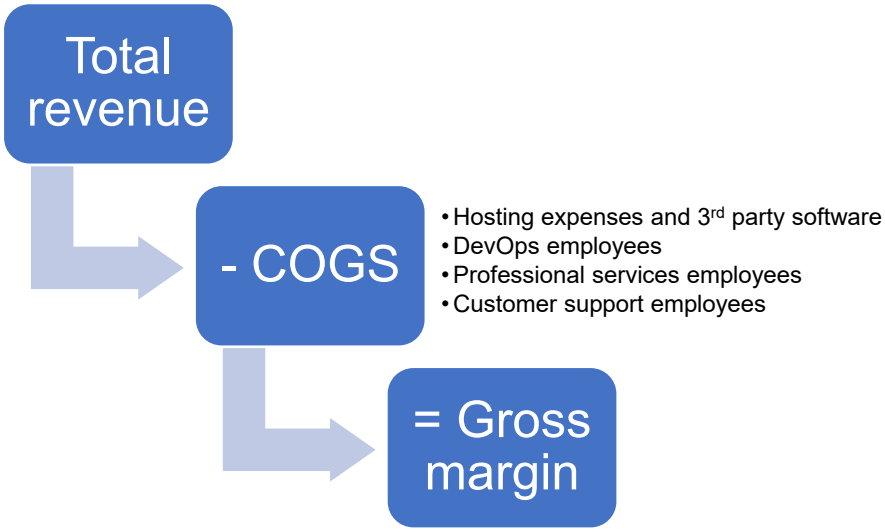

Figure 6 Example calculation of SaaS COGS adapted from Software Equity Group 2023.

2.3.4 Financial performance and decision-making

The choice of cost accounting method in SaaS businesses not only impacts financial statements but also plays a central role in the decision-making process. The choice of cost accounting method leads to variations in the allocation of costs, thereby affecting the interpretation of financial statements. Variations can impact key financial metrics such as COGS and gross margin, influencing how investors perceive the company's financial performance. According to Miller-Nobles & Mattison (2022), the choice of cost accounting method has a significant impact on financial performance, and accurate cost allocations are essential for informed decision-making.

Advanced cost accounting methods like ABC or TDABC provide more precise and reliable cost information, enabling better decision-making. By understanding the true cost drivers, managers can ensure that prices cover not only direct costs but also precisely allocate indirect costs, maintaining profitability. In addition, advanced cost accounting methods provide insights into resource allocation by identifying which activities or services consume the most resources, as highlighted by Horngren & al. (2014) This information guides resource allocation decisions to optimize efficiency and profitability, ensuring that resources are allocated to high-value services or products.

Furthermore, precise cost accounting allows managers to assess the relative performance of different segments or departments and identify areas for improvement. This data-driven approach supports strategic planning by providing a clear understanding of the cost structure and profitability

drivers within the organization. Managers can prioritize investment opportunities, evaluate the feasibility of new initiatives, and develop growth strategies based on accurate cost information. This is in line with the findings of Kaplan and Anderson (2007) who suggest that advanced cost accounting methods provide more accurate insights that can guide strategic planning.

To summarize, the choice of cost accounting method not only influences financial statements but also shapes the decision-making process in SaaS businesses. Cost accounting methods must align with the business objectives and provide reliable information for effective decision-making regarding pricing, resource allocation, performance evaluation, and strategic planning.

3 Research methods

This chapter provides a detailed account of the methodology used to address the research question: How can indirect costs associated with professional services be efficiently allocated in SaaS businesses? The methodology is clarified, presenting, and justifying the chosen research design, data collection methods, and data analysis techniques applied throughout the thesis, establishing the credibility and validity of the research.

The research seeks to bridge the gap between theoretical concepts and practical challenges faced by SaaS businesses, aiming to provide beneficial insights and recommendations for refining the indirect cost allocation of professional services.

3.1 Research design

In terms of the research approach, a mix of desktop research and qualitative research methods was applied. Desktop research utilized secondary data, which is information that has already been collected and studied by other researchers or organizations. The qualitative method involved conducting semi-structured interviews with key stakeholders within Leanheat and Danfoss, allowing for a detailed exploration of perspectives and experiences.

Data collection involved one-on-one interviews conducted through a virtual platform, Microsoft Teams. This method ensured flexibility and accessibility, allowing for the inclusion of participants from abroad and leveraging diverse knowledge.

Qualitative data analysis methods, specifically thematic analysis, was applied to the gathered interview data. Thematic analysis involves systematically identifying and interpreting patterns, themes, and categories within the qualitative data, enabling a rich exploration of the investigative questions defined in chapter one. The research design is descriptive, aiming to portray how indirect cost allocation can be refined.

3.2 Sampling

The target group of the interviews were employees within Leanheat and Danfoss. To enrich the data with various viewpoints, participants were selected from multiple departments within Leanheat and Danfoss, representing a mix of financial roles. The purposive sampling approach aimed to capture a range of experiences and insights from employees involved in SaaS financial operations.

The sampling criteria included individuals holding key financial roles:

- Interviewee 1 - General Accountant
- Interviewee 2 - Business Intelligence Partner

- Interviewee 3 - Product Line Controller
- Interviewee 4 - Finance Director
- Interviewee 5 - Finance Segment Director
- Interviewee 6 - Business Intelligence Manager
- Interviewee 7 - Business Analyst
- Interviewee 8 - Head of Controlling

3.3 Data collection

The data collection process involved a mixed-methods approach, combining desktop research with qualitative data collection through one-on-one interviews. Email communication was used for initial contact with interviewees. Semi-structured interviews were conducted virtually using Microsoft Teams, guided by a prepared interview guide for flexibility in exploring participant's insights and experiences. Interview sessions were recorded with the participants' consent to ensure accurate data interpretation, and transcripts were produced for further analysis.

3.4 Interviews

Interviews were conducted with eight professionals from Leanheat and Danfoss to gather insights on indirect cost allocation in SaaS businesses. Semi-structured interviews allowed flexibility with open-ended questions while following a predefined structure related to the investigative questions. first version of the interview was piloted with an interviewee, after which changes were made to better address the research objective and investigative questions.

Before the interviews, a cover letter detailing the purpose, duration, and recording method of the interview was sent to each interviewee assuring confidentiality. The interview sessions ranged in duration between 30-45 minutes, accommodating participants' schedules. A total of 11 questions were posed during each interview, covering aspects related to the research question. The interview guide and interview questions can be found in Appendix 1 of the thesis.

3.5 Data analysis

The data analysis process used a thematic analysis approach to systematically find patterns, themes, and categories in the qualitative data. First, the recorded interviews were transcribed into a text document format. To discover recurring patterns and emerging themes the transcripts were coded line by line and categorized to thoroughly explore the themes in the investigative questions and interview questions.

IQ 1: What cost accounting methods are applicable for allocating indirect costs in SaaS businesses?	*Do you have any examples of cost accounting methods commonly used in SaaS businesses?*	*What cost accounting methods would you consider most accurate for calculating indirect costs in a SaaS business, and why?*
Interviewee 1	Interviewee is not familiar with using specific cost accounting methods for indirect costs; relies on information from business, controllers, and general administration.	Interviewee believes the best method for calculating indirect costs is through information from colleagues in general administration and business, as it helps identify service requests and post everything to the cost center that is responsible for that cost.
Interviewee 2	Interviewee highlights the importance of adhering to international accounting principles in a subscription-based business. Interviewee emphasizes the importance of booking costs in financial statements based on when services are provided, as they must always correspond to revenues and it affects profit and loss accuracy in service businesses.	Interviewee emphasizes the importance of matching high-level accounting and costing aspects related to profitability, ensuring a correlation between costs and revenues. Interviewee believes SaaS business is similar to production of goods, as both involve producing something (product or service), so a similar cost accounting method can be applied.
Interviewee 3	Interviewee acknowledges Danfoss' struggle with cost accounting in SaaS and expects it to take months or years to improve. Main issue is the lack of direct link between direct software costs and sales. Interviewee sees Danfoss as a company new to SaaS business. They are used to producing physical products and struggle with cost accounting for intangible products.	Interviewee envisions a system where electronic invoices from suppliers are linked to service cases, allowing for better tracking of costs and margins per customer. They also suggest the possibility of using an offline database for this purpose instead of the SAP system.
Interviewee 4	Interviewee acknowledges familiarity with costing methods and highlights that standard costing is not applicable to their SaaS business. They mention system issues and lack of proper equipment for cost allocation, suggesting a need for improvement in system capabilities. Interviewee explains that sales vs. cost recognition timing differs the SaaS business, making it challenging to apply standard costing methods. They emphasize the complexity of their situation and the difficulty in recommending a specific approach.	Interviewee believes standard variance costing could be useful for correct recognition of COGS. They acknowledge that customer consumption of services may not be linear despite fixed fees.
Interviewee 5	Interviewee says that Danfoss being a typical production company, a lot can be told about cost allocation for products but not as much for software. Interviewee acknowledges different cost accounting methods in SaaS businesses but admits to not being the best source for examples.	Interviewee explains that since Danfoss primarily focuses on hardware manufacturing, with software being a small part, they have limited involvement in cost allocation for SaaS.

Figure 7 Example of coded responses from five interviewees for IQ 1, interview questions 1 and 2

Given the qualitative nature of the research, no statistical analysis methods were used. The focus was on qualitatively capturing the knowledge and depth of participants' perspectives and experiences. Standard text processing software was used, and the thematic framework was documented to ensure transparency and replicability. The coded responses were reworded and made concise to allow for a more streamlined thematic analysis, but the interviewee's original quotes were used to support the results and discussion in the following chapter.

4 Interview results and discussion

This chapter presents the results of the primary research conducted through in-depth interviews with key stakeholders in Leanheat and Danfoss. The results are presented in a narrative format, supported by direct quotes to highlight findings from the interviews. In the subsequent discussion, the interview responses are linked to the theoretical framework to enhance comprehension of the challenges and possibilities associated with allocating indirect costs of professional services employees in a SaaS business.

4.1 Cost accounting methods in SaaS businesses

The thematic exploration into cost accounting methods commonly used in SaaS businesses revealed a variety of practices within the industry. Interviewees provided insights reflecting the difficulties of cost allocation, as well as justified reasoning for choosing a specific cost accounting approach. While there was a range of perspectives, several common themes emerged throughout.

1. *Do you have any examples of cost accounting methods commonly used in SaaS businesses?*

Interviewees 1 and 5 expressed a lack of familiarity with specific cost accounting methods. Interviewee 1 relied on information internal stakeholders, stating, *"Everything is based on the information that we receive from business or controllers or our colleagues in general administration."* Similarly, Interviewee 5 admitted to not being the best source for examples and highlighted the challenge of applying traditional cost allocation methods to software products within a manufacturing-oriented company like Danfoss, stating, *"Typically, since we're a production company, I can tell you a lot about cost allocation for our products, not as much for software."*

Conversely, Interviewee 2 emphasized the importance of adhering to international accounting principles in a subscription-based business. They explained the significance of aligning cost recognition with revenue generation to ensure accuracy in profit and loss statements, emphasizing, *"Accounting wise, the time is relevant when the service is provided … and for the service business, this is quite relevant because you need to be really careful of what you have in your profit and loss - that must always correspond to your revenues."* This viewpoint was further supported by Interviewee 8, who noted the current practice of recognizing expenses in a manner consistent with revenue recognition, albeit with manual processes for handling prepaid services and deferred revenue.

Interviewee 3 provided insights into Danfoss' struggle with cost accounting for SaaS, attributing it to the company's transition from producing physical products to offering intangible services. They underscored the challenge of establishing a direct link between software costs and sales,

indicating a need for improvement in cost accounting practices tailored to the SaaS model, stating, *"We are now selling and invoicing something that you cannot take off the shelf. It's something that is nonmaterial … linking the cost side of that to the sale is not something we've been very good at."*

Interviewee 4 acknowledged familiarity with costing methods but noted the inapplicability of standard costing to their business due to system issues and the timing disparity between sales and cost recognition in the SaaS industry. They highlighted the difficulty in recommending a specific approach, indicating a need for improvement in system capabilities to facilitate accurate cost allocation for SaaS businesses, stating, *"When you look at sales vs. cost recognition … you have a pretty different setup and the way teams or costs are being absorbed, versus a tangible goods production setup, where you're pretty clear what the costs are that this particular piece has absorbed."*

To conclude, Interviewee 7 expressed uncertainty about commonly used cost accounting methods in SaaS businesses, citing organizational barriers and resource intensity as factors that have hindered the implementation of sophisticated cost allocation methods, stating, *"At least when it comes to indirect costs, we have quite simple methods for allocating them."*

2. What cost accounting methods would you consider most accurate for calculating indirect costs in a SaaS business, and why?

When discussing cost accounting methods most accurate for calculating indirect costs Interviewees 1, 2, and 6 shared similar perspectives on aligning cost accounting with revenue recognition. Interviewee 2 elaborated on aligning high-level accounting with profitability, drawing parallels between service businesses and hardware production. Interviewee 6 suggested benchmarking subscription-based cost calculations used by companies like Microsoft to better account for indirect costs, stating, *"When we are working with subscriptions … that cannot be much different from whatever Microsoft or any other software company is doing."*

Interviewees 3 and 7 discussed the importance of specific methods for accurate cost calculations. Interviewee 3 proposed a system linking electronic invoices to service cases for better tracking, stating, *"When we get the invoice from the company … in an electronic way, we could get that connecting into service cases … and then have a service case per customer … then you get a margin per customer."* Interviewee 7 expressed a preference for activity-based costing or time-driven activity-based costing for accurate indirect cost calculations. Similarly, Interviewee 6 emphasized the importance of gaining clarity on profitable and non-profitable areas through better cost accounting, suggesting structuring cost accounting around service packages as a potential solution.

Interviewee 4 suggested standard variance costing for correct recognition of COGS, acknowledging non-linear service consumption between customers despite fixed subscription fees. Interviewee

8 expressed uncertainty about specific methods for SaaS businesses, noting the importance of costs following revenue for service-based businesses. Interviewee 5 underscored Danfoss's limited involvement in software cost allocation due to its focus on manufacturing hardware.

Interviewees shared a spectrum of opinions on the applicability of ABC and TDABC methods as cost accounting methods for SaaS businesses. Interviewee 1 favoured a responsibility accounting approach, stating, *"We post everything exactly to the cost center that is responsible for that cost."* On the other hand, interviewee 7 recommended ABC or its newer version, TDABC, stating, *"If you want very accurate or precise calculations, you would want to aim for something like ABC or utilizing the newer version of that, TDABC."*

Interviewee 3 proposed an idea of implementing background software for tracking time that would be connected to service cases, as this would help in cost allocation. Interviewee 4 explored cost absorption within a standard SAP setup, using activity types to spread costs over materials or activities, stating, *"When you look at cost absorption and how we actually set up production cost centers … you will see that indirect cost centers very often in the end fully absorb into the different production orders."*

3. Would you consider ABC/TDABC generally applicable as a cost accounting method for SaaS businesses?

Considering TDABC, Interviewee 5 expressed reservations about implementing a time-tracking based system due to the current business size but acknowledged its potential scalability. They discussed possible issues with tracking time for multitasking employees, stating, *"If you have white-collar employees that do multiple things, you need to have almost like a time measurement system in place that measures how much of their day they spend on certain tasks."*

Interviewees 2, 3, and 4 discussed various implementations of TDABC. Interviewee 2 proposed creating a bill of services and treating costs as variables based on factors like volume and consumption. They mentioned, *"When considering the service business, I have always had in my mind a sort of mirror compared to the production of goods. Because at the end of the day, we are producing services."* This suggestion reflected manufacturing companies' use of a bill of materials to present the product's structure and allocate costs accordingly.

Interviewee 8 described a detailed estimation process for service hours, acknowledging challenges in correlating estimations with sales. They also mentioned potential application to software-based businesses, albeit with assumptions and complexities, elaborating, *"If we think services, theoretically we can do the same thinking. We can then estimate what is the price for the external employees for their hourly rates. Do we need the same number of hours for this particular service? Or*

maybe we have some R&D development from last year, which increase our productivity and profitability, and we will sell more, but we don't need so many employees."

In summary, while some interviewees favoured ABC/TDABC methods for precise calculations, others raised concerns or suggested alternative approaches, reflecting a mixed perspective on their applicability in SaaS businesses.

4. *What challenges do you foresee when implementing specific cost accounting systems in SaaS businesses?*

When considering the challenges of implementing specific cost accounting systems in SaaS businesses, the responses from interviewees shed light on multiple obstacles. Interviewee 1 and Interviewee 8 focused on the difficulty in transitioning accounting methods from manufacturing to software businesses. Interviewee 8 emphasized the absence of automated systems for expense and revenue recognition in SaaS businesses, stating, *"I think the challenge that we have in the organization is the system doesn't allow us to do it automatically … the system is not 100% built for SaaS."* Interviewee 8 also mentioned how the speed of the growth of business is not directly correlated with the increase in costs for SaaS businesses.

Interviewee 2 and Interviewee 4 stressed the importance of understanding business processes to determine costs accurately. Interviewee 2 pointed out the need for profitability assessment, stating, *"If you want to understand the profitability of the business, you need to correlate the cost structure to the sales."* Interviewee 4 highlighted the need to identify and track costs accurately, particularly in non-factory settings where tracking employee work hours poses challenges, stating, *"You have to find a way to assign the cost to a certain customer that matches that income stream … today we are operating with basically semi-finished goods that are absorbing the cost somehow, but not necessarily by customer."*

Challenges related to allocating costs in SaaS businesses were discussed by Interviewee 3 and Interviewee 5. Interviewee 3 suggested treating each sale as a project to better tie costs to sales, and adapting systems like SAP to meet company needs. Interviewee 5 elaborated on the administrative burden of implementing time-tracking systems and the importance of selecting appropriate tools for the process, explaining, *"That comes with some administrative burden."*

Interviewee 6 underscored challenges in measuring indirect costs like data management and personnel monitoring. They also noted the need for tailored systems for SaaS businesses, stating, *"The trouble we have with SAP today is that that's based on a factory setup."* This statement continued to demonstrate once more how unsuitable the current tools were for the requirements of a SaaS business. Interviewee 7 mentioned resource constraints and the lack of proper tools as

major challenges in implementing ABC/TDABC systems, stating, *“Data gathering takes a lot of resources from the people and it's not easy to set up.”*

4.2 Challenges in refining professional services costs

When considering whether professional services costs should be classified as part of COGS in the case of Leanheat, interviewees had contrasting opinions. Enquiring about the challenges of including professional services employees in COGS revealed both industry-specific factors and the influence of organizational guidance.

5. *When considering professional services, do you classify them as a part of COGS? Why, or why not?*

Interviewee 1 and Interviewee 6 both discussed the importance of linking professional service costs directly to sales when considering classifying them as COGS. Interviewee 1 emphasized this linkage, stating, *“In my opinion, if we have a sales document related to those costs, then it would make sense to consider it at it as cost of goods sold."* Interviewee 6 echoed this sentiment, suggesting that if professional service costs are billed from the customer and directly related to sales, they should be included in COGS.

Interviewee 2 and Interviewee 5 focused on the challenges of distinguishing between different types of professional employees and the nature of their work. Interviewee 2 explained the difficulty in distinguishing between blue-collar and white-collar employees, asking an important question, *“Without this person, can you provide the service?”*

Interviewee 5 viewed external professional services employees as part of COGS due to their hourly nature but preferred to keep in-house employees as fixed expenses, justifying the decision by explaining as sales decrease, variable costs should also decrease at the same rate, maintaining the margin. When looking at the parallel between blue-collar production workers and white-collar professional services employees, Interviewee 5 had a shift in perspective, elaborating, *“If we produce software, then in theory those costs should also be considered COGS. But I don't think that's how we treat them today.”*

Interviewees 5 and 6 suggested potential solutions for refining cost allocation of professional services. Interviewee 5 proposed the use of tracking tools to monitor customer interactions and improve resource allocation, particularly in projects lacking detailed cost overviews. Interviewee 6 advocated for creative approaches to viewing services as production entities, suggesting a separation of subscriptions from hardware to streamline cost analysis.

Interviewee 3, Interviewee 7, and Interviewee 8 addressed the nuanced nature of professional service costs and their classification in COGS. Interviewee 3 questioned whether professional services costs in SaaS should be considered COGS, suggesting that only part of the work of white-collar employees' ties to the support of the SaaS product, saying, *"I would keep them a fixed expenses because part of what they do ties to the subscription of support … but not all of it."*

Interviewee 7 mentioned established practices but emphasized the importance of understanding certain costs as COGS due to their direct relation to the service offered. They acknowledged, *"In SaaS businesses, there are probably lots of different types of costs that actually in many other settings could be just fixed costs or overhead costs, or you might want to understand them as cost of goods sold. So that's one thing to remember, that the nature of the business is quite different."*

Interviewee 8 stressed the importance of the flexibility of their cost structure with external professional services employees and the challenge of not having an overview of costs for specific services. They also shed light on a more organizational alignment, stating, *"Thinking about the COGS in SaaS business and at Danfoss, there is a strict guidance that we can't put white-collar employees into the COGS."*

Interviewee 4 suggested that professional services can be classified as COGS if they contribute to project completion and value creation but acknowledged the lack of well-defined guidelines. They also mentioned the seasonality of Leanheat's SaaS product, explaining how that would impact the workload variance and demand fluctuation, and in turn, reflect in the financial performance of the company.

6. *How do professional services employee costs influence the composition and calculation of COGS within SaaS businesses?*

The influence of professional services employee costs on the composition and calculation of COGS within SaaS businesses was the next topic discussed in the interviews. Interviewee 1 and Interviewee 5 discussed the linkage between costs and net sales and the nature of variable costs. Interviewee 5 explained the importance of maintaining margins by adjusting variable costs proportionally to sales fluctuations, emphasizing, *"The margin should stay the same … if your sales go down, there's an expectation and that's for all other businesses, that the variable cost will go down at the same rate."*

Interviewee 2 and Interviewee 7 focused on distinguishing professional services' employee roles and the classification of white-collar costs. Interviewee 2 emphasized the need to differentiate between support and after-sales services, noting the blurred line between them. Interviewee 7 addressed the challenge of understanding SaaS cost allocation definitions, suggesting that white-

collar costs may be considered semi-fixed depending on the specific case, providing an interesting viewpoint on cost allocation by asking, *“If you double your product or service, you might need, let's say one and a half times of these employees … what's the better place to report these people's salary costs? Is it now fixed costs or under cost of goods sold?”*

Following the difficulty of deciding how professional employee costs should be allocated, Interviewee 2 stated, *“You need to be careful in distinguishing the roles of the employees.”* This was supported by Interviewee 3, as they discussed the movement of professional services costs to COGS and the fluctuations in demand, suggesting stricter role organization and awareness when hiring or making changes.

Interviewee 4 discussed the implications for profitability analysis, emphasizing the need for tracking hours worked on projects, questioning, *“How many hours have I earned on the project? You can see if you are over under over utilizing it, the better your absorption will be … if you don't have enough projects, the cost per project will be very high.”* When discussing potential solutions, Interviewee 4 suggested the implementation of a project tracking tool to document employee work hours and improve cost allocation accuracy. They stated, *"We need better oversight to ensure all costs are accounted for in projects."*

Interviewee 8 accentuated the distinction between white-collar and blue-collar employees in cost allocation, suggesting the analysis of EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) for profitability. Interviewee 8 mentioned*, "What you would do with white-collar employees sitting in your COGS … you will not see the correct profitability on the services you are offering to the customer because you will still have a heavy cost.”* Interviewee 8 also reflected on the need for a holistic view of service profitability, emphasizing the interaction between digital services and hardware sales in Danfoss. They stressed the importance of precise cost estimation per customer and highlighted the indirect impacts of SaaS on overall organizational dynamics.

7. What challenges do SaaS businesses encounter when including professional services employee costs into COGS?

Interviewee 1 and Interviewee 7 underscored the difficulty in establishing general rules for cost calculation and ensuring data quality. Interviewee 1 highlighted the challenge of determining costs based on outcomes and working with controllers, elaborating, *"It's very difficult to create a general rule for all services.”* Interviewee 7 discussed an organization-specific barrier referring to Danfoss’ internal guidelines by mentioning, “*The main issue could be the traditional thinking and strict rules.”*

Interviewee 5 addressed concerns regarding the classification of professional services costs and their impact on contribution margin calculations, adding, *“This comes with the expectation that the*

cost will flex with the revenue. And when we can't guarantee that, it will then maybe create some problems with the contribution margin that we show for the software service."

Interviewee 3 and Interviewee 8 discussed the difficulties related to cost allocation and estimation. Interviewee 3 emphasized the challenge in directly linking costs to sales, stating, "*The definition of COGS is that you need to be able to directly link it to the sales. And that's our problem that we often have difficulties with … there's the initial setup of the software, and then there's the running support and update."* They continued by acknowledging struggles with understanding the sales pipeline and estimating the demand for professional services. Interviewee 8 identified challenges in estimating cost per customer due to assumptions and uncertainties, highlighting the need for more detailed estimation regarding involvement of professional services.

Interviewee 4 acknowledged challenges in balancing top-line and variable costs and suggested focusing on improving accuracy for cost recognition. They also elaborated how in the case of Leanheat, the company is still operating on teamwork, so, understandably, there is not yet full clarity on the allocation of employee roles. Interviewee 6 highlighted the challenge of measuring indirect costs involving both fixed and variable costs, stating, *"The hard part is how to measure all the data management, all the indirect things … there's some fixed cost and some indirect costs that somehow go together."*

4.3 Industry-specific factors

Factors influencing the inclusion of professional services costs into COGS were discussed by the interviewees, pointing out industry-specific challenges and factors for consideration.

8. Are there industry-specific factors complicating the inclusion of professional services costs in COGS for SaaS businesses?

Interviewee 2 and Interviewee 5 noted the impact of accounting principles and business expectations on cost categorization and management. Interviewee 2 observed the variability in COGS categorization among software companies and recognized how it could make comparison and transparency challenging.

Interviewee 3 and Interviewee 8 addressed the complexities of cost allocation and revenue growth in SaaS businesses. Interviewee 3 suggested allocating a portion of fixed expenses for white-collar employees into COGS, stating, *"The allocation should be based on … some kind of measure, maybe not all the time, but a measure on how many calls are we pulling or how many calls are we receiving."* Interviewee 8 highlighted the challenge of scaling costs alongside revenue growth in

SaaS businesses, explaining the expectation for SaaS businesses, *"You are increasing your revenue, so you are growing the business, but your costs will not increase with the same speed."*

Interviewee 4 discussed the challenges specific to SaaS businesses and noted the difficulty in setting up variable invoicing for services in ERP systems not designed for it. Interviewee 1 and Interviewee 7 emphasized industry-specific factors for resource allocation as key considerations, with Interviewee 1 discussing the complications arising from integrating services into goods and the need for transformation. Interviewee 7 pointed out the issues of allocating more resources towards cost accounting, stating, *"That's the practical problem always in these things. Even though I think that quite many companies could benefit from actually allocating more resources towards cost accounting … it can be a little bit difficult to see the value beforehand."*

9. What strategies can SaaS businesses use to refine cost allocation and ensure an accurate representation of COGS?

To refine cost allocation and ensure an accurate representation of COGS, SaaS companies can implement several different methods, as suggested by the interviewees. Interviewee 1 agreed that implementing a tool to track professional services by customer or project would be helpful. Interviewee 2 emphasized the importance of constant optimization and adjustment, mentioning, *"When you start doing cost investigation on the profitability of the business, you need to start thinking a different way in terms of volume, what is driving your revenue."* They mentioned the similarity to the actual costing process in the production of goods, which is updated monthly.

In the context of Leanheat and Danfoss Interviewee 3 emphasized the importance of securing long-term, high-margin subscriptions over immediate investment margins. They believed this approach could strengthen customer relationships with Danfoss and in turn increase sales of other Danfoss products. Similarly, Interviewee 4 described how separating the initial investment from the subscription would help in understanding profitability and cost allocation.

Interviewee 5 underscored the importance of identifying variable costs for better transparency and exploring optimization of internal processes, stating, *"We have also temporary workers, we can work overtime … so we treat them as variable costs and we try to use the instruments that we have to really make those costs variable as much as possible."*

Interviewee 7 proposed alternative financial reporting methods for SaaS businesses and emphasized the need for a good understanding of both the business and cost accounting, stating, *"You could actually not report the cost of goods sold, but rather, you would report production costs. So then there you can actually include more widely these type of things [professional services employee costs]."*

Interviewee 8 pointed out the need for optimizing and automating SaaS platforms and discussed the importance of distinguishing between research and development (R&D) and operational costs, stating, *"Fixed expenses need to have a few layers … the operations related cost, R&D cost, and overhead cost."* They also noted the need for organizational awareness when planning growth, ensuring operations have sufficient resources to support expansion.

4.4 Decision-making based on cost accounting methods

To conclude the interviews, the impact of cost accounting methods on decision-making were discussed, prefacing the topic by questioning whether having a standardized cost accounting method would clarify indirect costs for SaaS businesses.

10. Do you believe standardizing a cost accounting method would help in clarifying indirect costs?

Interviewee 1 summarized that managing exceptions is a current practice and believed that applying a different costing method would still involve managing exceptions similarly. Also, Interviewee 2 questioned the need for standardized principles, asking if they should be applied to processes or accounting rules. Interviewee 7 believed standardizing indirect cost allocation for SaaS businesses may be difficult and not viable due to its case-specific nature and relation to management accounting.

Interviewee 4 suggested that standardizing a cost accounting method would provide clear guidance to employees, specifically finance personnel. Interviewee 5 echoed this opinion, saying, *"In general, I think it would be a big help, at least if we create a framework for Danfoss … we need to come up with principles that would fit all our needs. Sometimes principles don't work perfectly for some of our businesses, and then we need to be able to tailor them a little bit."*

Interviewee 6 saw a growing need for standardized principles in various sectors due to increasing focus on the service side, cloud-based solutions, and multiple ERP systems. They concluded by adding, *"If we had the structure in place, then it's also easy to reuse some of the things across [the organization]."*

11. How does the choice of a specific cost accounting method impact the decision-making process in SaaS businesses?

Interviewee 1 underscored the importance of case-by-case decision-making in cost determination. Conversely, Interviewees 3 and 4 provided insights into the challenges of cost differentiation. Interviewee 3 discussed the distinction between development costs and COGS, accentuating the need for balanced pricing strategies to maintain margins. Meanwhile, Interviewee 4 highlighted the

complexities of the setup phase versus the income stream stage, suggesting a closer examination of the initial setup's cost implications.

Interviewee 7 mentioned that smaller SaaS organizations may lack robust knowledge in cost accounting, leading to making potentially harmful decisions due to insufficient understanding. They also addressed challenges stemming from traditional reporting methods and emphasized the importance of deeper scrutiny when comparing financial performance among companies. They cautioned against relying solely on media-discussed profit margins, which often overlook hidden costs and distort actual profitability, affecting decision-making.

Interviewee 6 highlighted the necessity for a better understanding of financial performance in different areas and identifying successes and failures to make informed decisions for the business. They also proposed leveraging historical data for informed decision-making, emphasizing the need for proper structuring and understanding of financial performance.

Interviewee 8 stressed the lack of EBITDA on a product level and the need for better transparency in profitability. They emphasized the importance of key stakeholders, such as product managers and R&D teams, to consider financial terms like contribution margin and EBITDA in their decision-making processes, summarizing, *“We still lack in transparency and a good understanding of the profitability.”*

While cost accounting in SaaS businesses presents challenges, there is a consensus among interviewees regarding the need for improved transparency and tailored solutions to address the unique characteristics of the SaaS industry.

5 Conclusion and recommendations

This chapter concludes the research findings by answering the research question and investigative questions. The objective of the research was to investigate methodologies for refining the allocation of professional services-related indirect costs in a SaaS business context. This chapter also includes recommendations based on the literature and research findings for the commissioning company, analysis of the validity, reliability, and relevance of the research as well as the author's reflection on learning.

5.1 Key findings

Based on the thorough research conducted in this thesis, it is apparent that the allocation of indirect costs is a complex topic requiring careful consideration. Addressing the investigative questions and the research question, "How can indirect costs associated with professional services be efficiently allocated in SaaS businesses?" resulted in key findings and insights that can inform and guide Leanheat in refining its cost allocation practices.

IQ 1: What cost accounting methods are applicable for allocating indirect costs in SaaS businesses?

The research revealed diverse opinions on cost accounting methods, with some interviewees acknowledging a lack of familiarity with specific methods, while others emphasized the alignment of cost recognition with revenue. This pointed out the necessity for tailored cost accounting methodologies that accommodate SaaS businesses. By integrating principles from cost accounting systems such as ABC and TDABC, businesses can achieve a more accurate allocation of indirect costs to specific activities and outputs, which in turn enables more informed decision-making.

The research findings are consistent with existing cost accounting models and theories, particularly for service-oriented businesses. Leanheat is encouraged to explore the implementation of advanced costing methodologies to improve the accuracy and relevance of cost calculations. By leveraging more advanced cost allocation techniques, Leanheat can gain deeper insights into cost drivers and optimize resource allocation for improved profitability. Notably, ABC's effectiveness in linking indirect costs to specific activities and cost drivers offers a more precise understanding of cost allocation compared to traditional methods, whereas TDABC simplifies the allocation process by using time as a primary cost driver.

IQ 2: What challenges arise in allocating costs associated with in-house professional services employees to the cost of goods sold?

Obstacles such as varying employee involvement across projects, distinguishing employee roles and finding an accurate cost attribution method were the most prominent obstacles in allocating costs related to in-house professional services employees to COGS. These challenges linked back to how necessary it is to modify cost accounting systems to consider service-based industries with intangible products and nuanced cost structures. Additionally, shifting Danfoss' cost allocation practices from a manufacturing mindset to a SaaS-business posed an internal challenge.

Leanheat should focus on connecting data between invoicing systems and service cases to establish a direct link between costs, services provided, and customer revenues. This integrated approach can lead to more detailed resource allocation. By aligning costs directly with the revenue generated from each customer or SaaS product, Leanheat can better assess the profitability of their customers or products and tailor their services accordingly. Additionally, by adopting sophisticated cost allocation techniques cost drivers can be defined to refine resource allocation.

IQ 3: How do industry-specific factors affect the allocation of indirect costs for SaaS businesses?

The allocation of indirect costs for SaaS businesses is influenced by industry-specific factors, such as the shift from physical products to software services. Traditional accounting frameworks do not fully address the impact of accounting principles on cost categorization for SaaS businesses. Additionally, challenges in accounting for professional services costs highlight how important it is for cost management policies to be transparent and flexible.

In the case of Leanheat, the fluctuations in service demand and revenue reflect an uncertainty on the indirect costs. The lack of direct correlation between costs and sales impacts the scalability, which in turn discourages SaaS businesses from making detrimental decisions to indirect cost allocation. The features of subscription-based revenue models and their scalability requirements affect indirect cost allocation.

IQ 4: How do different cost accounting methods impact the decision-making process in SaaS businesses?

The choice of cost accounting method offers differing levels of accuracy and granularity in cost allocation. Sophisticated methods provide a deeper understanding of cost structures and drivers, empowering decision-makers to allocate resources effectively, plan pricing strategies, and conduct comprehensive profitability analyses. Accurate input and output data is necessary for successful cost allocation.

Ensuring that costs are accurately matched with the corresponding revenues is essential for maintaining the integrity of financial statements and decision-making. To address this, Leanheat could

implement robust time-tracking mechanisms, enabling precision in cost allocation and a better understanding of profitability. Leveraging advanced methods improves transparency, enhances informed decisions, resource optimization, and overall financial performance.

5.2 Recommendations

Applying knowledge from the insights gained through the research findings and theoretical framework, cost allocation guidelines should be developed specifically for the SaaS business model, combining principles from ABC or TDABC to accurately trace indirect costs to various activities and outputs, thereby enhancing accuracy in cost allocation processes.

To overcome the challenges associated with transitioning from traditional cost accounting methods to those suitable for SaaS businesses, investment should be made in tailored solutions for cost allocation, tracking, and analysis. Implementing advanced software systems that automate expense and revenue recognition processes can streamline the allocation of indirect costs.

Establishing a clear correlation between cost structures and sales revenue is essential for gaining a comprehensive understanding of profitability. Leanheat should focus on aligning cost structures with sales activities to improve financial transparency and support decision-making. Responsibility accounting can help departments understand their role in in cost control and profit planning, thereby improving efficiency and accountability.

Leanheat should prioritize improving data integration and automation capabilities to streamline cost allocation workflows and improve data accuracy. By implementing robust systems for tracking and analysing costs concerning revenue generation, Leanheat can optimize resource consumption and drive sustainable growth. Improving the accuracy in allocating costs can help uncover correlations between current customer needs and future service demand, refine pricing strategies, identify operational inefficiencies, and calculate profitability on a more detailed level.

To refine cost allocation processes and ensure an accurate representation of COGS, Leanheat could implement lean principles to streamline workflows, identify opportunities for cost-saving measures, and leverage historical data for informed decision-making. Implementing robust systems for tracking employee time spent on different projects and activities can enhance the accuracy of cost allocation to COGS and other relevant cost categories. Incorporating tools for tracking professional services employee work by customer or project can provide valuable insights into cost drivers and resource utilization.

Additionally, encouraging cross-functional collaboration and knowledge-sharing within Danfoss can foster a culture of innovation and drive organizational growth. Considering the impact of industry-

specific factors on cost allocation practices, cost accounting methods should be continuously reviewed and adjusted. To keep up with the evolving industry, Leanheat and Danfoss need to stay in tune with the latest trends and benchmark practices of established SaaS companies.

By applying these recommendations, Leanheat can enhance its cost allocation practices, improve decision-making processes, and position itself for long-term success in the competitive field of SaaS businesses. These recommendations are designed to support Leanheat's sustainable growth while maintaining a focus on operational efficiency and financial performance. To conclude, by refining internal cost allocation processes, Leanheat can improve operational efficiency and profitability, and facilitate better decision-making, and foster trust among investors, customers, and other stakeholders.

To enhance the conclusions made and increase the weight of the recommendations presented, a visualised principle for indirect cost allocation was created by the author. This flowchart represents the key components and considerations for allocating indirect costs in SaaS businesses, incorporating the insights from the interviews along with the theoretical framework studied. This flowchart can serve as a reference for managers, decision-makers, and other stakeholders, also enhancing the credibility and applicability of the research findings.

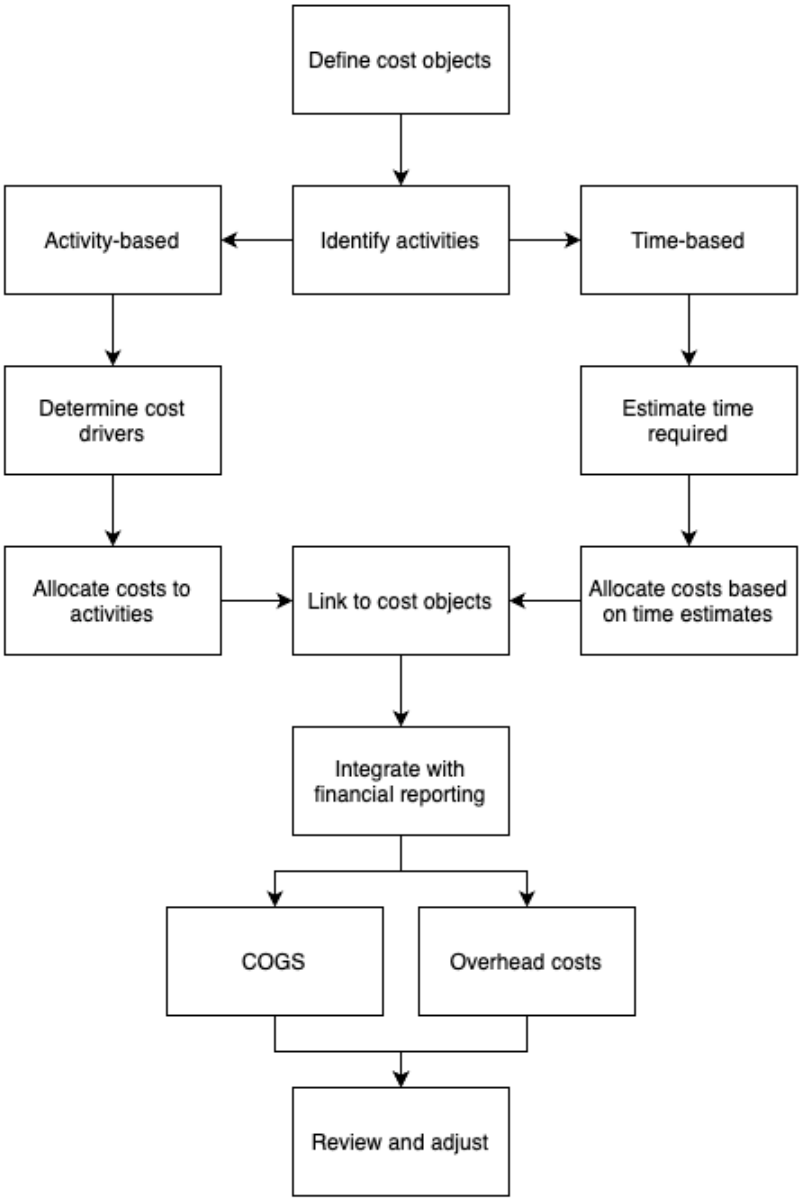

Figure 8 Indirect cost allocation flowchart

Linking indirect costs, such as those related to professional services employees, to cost objects in a SaaS business involves a systematic approach to ensure precision. Here are steps to achieve this linkage effectively:

1. Define the cost objects, which could be products, services, projects, or customers. Cost objects represent the entities to which the costs will be allocated.
2. Identify the activities within the SaaS business that consume professional services employees' resources such as onboarding, consultation, technical support, customization, and integration.

3. For activity-based allocations:
    a. Determine the cost drivers for each activity. Cost drivers are factors that cause costs to be incurred. For example, the number of support tickets resolved could be a cost driver.
    b. Allocate indirect costs to cost objects based on the consumption of activities. This process involves assigning a portion of indirect costs to each cost object in proportion to the cost driver usage.
4. For time-based allocations:
    a. Estimate the average time required to perform each activity based on historical data or information from managers. A time tracking system could also be implemented to accurately capture time spent by professional services employees for each activity.
    b. Allocate indirect costs to cost objects based on the estimated or actual time consumed by each activity.
5. Assign indirect costs to cost objects defined in step one. This is the process of linking the indirect costs allocated to activities with the specific cost objects that benefit from or are associated with those activities.
6. Ensure that the allocated indirect costs are integrated into financial reporting systems to provide a comprehensive view of cost structures and profitability by cost object. Categorize the indirect costs as either COGS or overhead costs, depending on the activity's association with direct production or delivery of services.
7. Review and adjust regularly to ensure that indirect costs are appropriately linked to cost objects. Update cost rates and time estimates based on changes in business operations or market conditions.

After a methodology is chosen, it is important to be consistent and have a process to identify these costs on an ongoing basis. Without a proper methodology, gross margins will wildly fluctuate, and it will be difficult to interpret how the business is performing. This will also help establish a direct link between revenues generated and services provided by professional services employees. Implement advanced reporting and analysis tools to visualize the allocated costs per cost object, enabling in-depth insights into profitability, cost-effectiveness, and service utilization.

5.3 Validity, reliability, and relevance

In the pursuit of high-quality data, various measures were implemented to ensure the validity and reliability of the research findings. The semi-structured interview guide was designed to align with the research question and investigative questions. The inclusion of open-ended questions allowed for a comprehensive exploration of participants' perspectives, reducing the risk of constraining

responses. Additionally, the use of a diverse set of interviewees from different departments within Leanheat and Danfoss aimed to enhance the transferability of findings and increase the validity of the research's insights. However, it should be noted that the sampling strategy may introduce biases, potentially limiting the generalizability of the findings beyond Leanheat.

Reliability in qualitative research emphasizes consistency and repeatability. To ensure reliability, a structured approach was followed throughout the research process. The semi-structured interview guide provided a standardized framework for interviews, promoting consistency in the data collection process. The use of virtual platforms for interviews and the recording of sessions allowed for accurate transcription and interpretation, contributing to the reliability of the data. Nevertheless, resource constraints such as time limitations may have impacted the depth and breadth of data collected, potentially affecting the reliability of the findings.

To maintain relevance, the interviews explored topics closely related to the investigative questions, ensuring that the gathered information directly aligns with the central theme of the research. Ethical considerations were addressed in the initial communication with interviewees, where the purpose, duration, and recording methods of the interviews were communicated. Participants were also assured of the confidentiality of their responses.

The research focused on gathering insights from professionals directly involved in financial roles within Leanheat and Danfoss, ensuring the relevance of the data collected to the specific context of the research. The inclusion of experienced individuals added depth and applicability to the findings, contributing to the overall relevance of the research. However, it's important to recognize that the findings may not fully represent the experiences and perspectives of professionals in other SaaS businesses or industries, limiting the external validity of the research.

5.4 Reflection on learning

Reflecting on my journey through the thesis process, I encountered opportunities for personal and professional growth and development. Upon completing this research, I appreciate the importance of careful planning and organization even more than before. Working on a commissioned research-based thesis helped me understand how to balance academic knowledge and real-world application.

As a student specializing in finance and accounting, this process allowed me to deepen my understanding of key concepts and methodologies within my field. Applying theoretical knowledge from my academic journey to real-world challenges improved my analytical skills and problem-solving abilities.

I am grateful that I was presented with the opportunity to write a thesis for the company I am currently employed at, as this allowed me to collaborate with colleagues with years of valuable knowledge. Working alongside industry professionals enriched my research with practical insights and broadened my perspective on industry practices, challenges, and trends.

The thesis process highlighted the importance of proactive planning and goal setting in my academic and professional journey. It encouraged me to evaluate my career aspirations, aligning them with my evolving interests and strengths. The thesis journey instilled confidence in my ability to tackle complex research and collaborate effectively with various stakeholders. To conclude, the process emphasized the value of lifelong learning and curiosity.

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Appendices

Appendix 1. Interview Guide

Who are to be interviewed? How many are interviewed?

The eight interviewees chosen for this research represent a diverse variety of expertise within the finance and accounting departments at Leanheat and Danfoss. Their roles span across financial analysis, controlling, business intelligence, and general accounting. The identities of the interviewees remain confidential, respecting their privacy upon request.

Justify the decision

Qualitative interviews have been chosen to research the details of indirect cost allocation in a SaaS business. This methodological choice allows for a comprehensive exploration of various themes, including cost accounting methods, challenges associated with allocating costs of in-house professional services employees, and the influence of industry-specific factors on the allocation of indirect costs.

Qualitative interviews offer the flexibility needed to investigate themes and uncover nuanced insights important for this research. The involvement of financial professionals aligns with the objectives of the research and enhances the credibility and relevance of the findings.

RQ: How can indirect costs associated with professional services be efficiently allocated in SaaS businesses?

Themes to be covered in the qualitative interviews

- Cost accounting methods in SaaS businesses
- Challenges in refining professional services costs
- Influence of industry-specific factors
- Decision-making based on cost accounting methods

Investigative questions using a qualitative approach

IQ 1. What cost accounting methods are applicable for allocating indirect costs in SaaS businesses?

IQ 2. What challenges arise in allocating costs associated with in-house professional services employees to the cost of goods sold?

IQ 3. How do industry-specific factors affect the allocation of indirect costs for SaaS businesses?

IQ 4. How do different cost accounting methods impact the decision-making process in SaaS businesses?

Interview questions

1. Do you have any examples of cost accounting methods commonly used in SaaS businesses?
2. What cost accounting methods would you consider most accurate for calculating indirect costs in a SaaS business, and why?
3. Would you consider ABC/TDABC generally applicable as a cost accounting method for SaaS businesses?
4. What challenges do you foresee when implementing specific cost accounting systems in SaaS businesses?
5. When considering professional services, do you classify them as a part of COGS? Why, or why not?
6. How do professional services employee costs influence the composition and calculation of COGS within SaaS businesses?
7. What challenges do SaaS businesses encounter when including professional services employee costs into COGS?
8. Are there industry-specific factors complicating the inclusion of professional services costs in COGS for SaaS businesses?
9. What strategies can SaaS businesses use to refine cost allocation and ensure an accurate representation of COGS?
10. Do you believe standardizing a cost accounting method would help in clarifying indirect costs?
11. How does the choice of a specific cost accounting method impact the decision-making process in SaaS businesses?

Cover letter

Dear [Recipient],

As part of my research, I am focusing on understanding the intricacies of cost allocation (specifically indirect costs) within the Software as a Service business model. During the interview, which is expected to last approximately 30-45 minutes, topics discussed would include cost accounting methods, their impact on financial statements, the role of professional services employees in shaping cost structures, and the challenges associated with allocating their costs and incorporating them into COGS.

Rest assured; any personal information shared during the interview will be kept strictly confidential. Additionally, the session will be recorded solely for transcription purposes to maintain accuracy and validity, with the recording promptly deleted upon your request or if you choose to withdraw from the interview. Your participation in this interview would be greatly appreciated. Please let me know if you would be willing to participate and if you have a date/time preference.

Thank you for considering my request.