CHALMERS
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The Paradox of Project Cash Flow Forecasting

Exploring the forecasting process, deviations and complexity in innovation projects

Master's Thesis in the Master's Programme International Project Management

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Abstract

Project cash flow forecasting is an important aspect in many organizations. However, it is a relatively unexplored area in academia. This report has studied project cash flow forecasting in an organization that explained having issues with their forecast accuracy. The organization had two main worries regarding their faulty cash flow forecasts. First, that forecast deviations could be detected in quarterly reports and discourage current and potential investors. Second, that faulty forecasts could lead to the organization lending too little or too much, causing unnecessary costs.

By adopting a single case study approach with a qualitative and problem driven method, this study made several findings. It was discovered that only one of the issues mentioned by the company, how they are perceived in the quarterly reports, was an actual problem. The worries of faulty project cash flow forecasts causing trouble with lending money was a non-issue. Moreover, the lack of project cash flow forecast accuracy is not all due to the process, but to the environment in which the organization operate and the nature of their projects. This make some deviations unavoidable, indicating a need to manage them better.

The study was able to propose recommendations of how to improve cash flow forecasting processes at HygieneCorp. The recommendations mainly concern how to improve transparency and knowledge management regarding project cash flow forecast deviations. It was found that this can be done by improving communication within the organization to spread information and to make the varying institutional logics more homogeneous. Communication with current or potential shareholders is also key to explaining why cash flow forecast deviations occur.

Keywords: Cash flow forecasting, forecast deviations, project management, innovation projects, PMO, institutional logics, communication, knowledge transfer

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Abbrevations

Capex – Capital expenditures. Costs that can be capitalized and written off in the accounting.

FPM – Factory Project Manager.

MTO – Machine Take-Over, when HygieneCorp get full ownership of a machine and the supplier have fulfilled all clauses in the agreement.

PMO – Project Management Office.

PMO PM – Project Management Office Project Manager.

R&D – Research and Development.

Definitions

Capex Request – A contract between the project sponsor and the PMO PM. Includes an estimation of the capital expenditures, running-in expenditures and a forecast for a cash-out plan.

Fast Follower – Company adopting a strategy of recognizing others ideas (for products etc) and implementing them within their own organization to "catch up" on the market.

Innovation project – Projects aiming to achieve something new. These projects starts loosely defined and have high risk.

PMO PM – "Project Management Office Project Manager". Senior Project Managers who manage more complex projects with large supply chain impact.

Private Label – One company producing for example products which are offered under another company's brand.

1

Introduction

This chapter will provide an introduction to the thesis. First, a short company introduction will be presented, followed by background and problem description, purpose and aim, research questions, delimitations and report structure.

1.1 The organization

The study has been carried out in collaboration with a global company within the hygiene consumer business. The company operates in about 150 countries and have about 50 000 employees working in the organization. Net sales for 2017 were more than SEK 100 billion, indicating the size of the organization. As the report contains confidential information, the company wishes to remain anonymous. Accordingly, in this report, the company will be referred to as HygieneCorp ("Hygiene Corporation").

1.2 Background and problem description

Increasing competition pressures companies to continuously develop and introduce new innovative products. The complexity of working with innovation projects is mainly due to high uncertainty levels (Garcia-Quevedo, Segarra-Blasco & Teruel, 2018). Nonetheless, it is vital for companies to establish proper cash management routines to maintain their financial reputation. There are several tasks included in cash management where cash flow forecasting is one of them (Reider & Heyler, 2002). Yet, it is rather difficult to estimate and plan expenditures when the uncertainty levels are high, as they are in innovation projects (Mahmoud-Jouini, Midler & Silberzahn, 2016). Therefore, projects dealing with innovation are subject to more forecast deviations than other projects.

Drivers for improving cash flow forecasts can vary depending on different perspectives or logics of forecast deviations that resides within an organization. One aspect is the importance to preserve the financial reputation by producing accurate project cash flow forecasts (Sprague, 2017). The pressure of performing towards each quarterly report and thus the pressure for accurate forecasts has steadily increased. Therefore, the pressure of performing in annual reports has shifted towards performing in the quarterly reports. One reason for this is that investors and other stakeholders are interested in the return of the investments, where more information can be found in quarterly reports than in annual reports Butera (1996). As a result, companies are more aware of their quarterly result, and deviations in project cash

flows forecasts have gained more attention. Another aspect is the importance to focus on project success. If the focus is solely on following forecasted performance, the success-rate of projects could be affected.

Deviations from project cash flow forecasts can affect several aspects of the organization and their projects, and may affect or clash with project management routines. Establishing a balance between logics and having a common understanding and communication about deviations can increase the efficiency and project performance.

1.3 Purpose and research questions

To better understand the relation between project cash flow forecasts and project management routines, this thesis aims to investigate forecast deviations in large and complex projects. This should provide the investigated company with a better understanding of how to improve their project cash flow forecasts by establishing a common understanding of project cash flow forecast deviations. The purpose of this thesis is to explore how project management routines and other factors affect project cash flow forecasts to gain better knowledge of how deviations occur in a global organization with varying types of projects.

Cash flow forecasting is a prediction of future costs and can thus be a difficult task in large and high risk projects. Therefore, to create a better understanding of project cash flow forecasts and possible deviations from these, it is necessary to understand the process for making forecasts and why deviations occur. This leads to the first and second research question:

RQ1: How are cash flow forecasts made in innovation projects?

RQ2: What types of deviations happens and why do these occur?

Furthermore, at HygieneCorp, each project is both complex and unique; from building a new factory to producing a brand-new product or to change a small section of a machinery to allow product changes. There is a need to better understand how project cash flow forecast deviations can be avoided and how they can be better managed if they occur. This resulted in the third research question:

RQ3: How can the project cash flow forecast deviations be better managed?

This thesis is based on a qualitative case study research in a large organization operating within the ever-changing hygiene consumer business. HygieneCorp produce

several products and manage multiple large and complex innovation projects. The forecasts are subject to changes from the sponsors as well as from the industry.

1.4 Delimitations

As the topic of cash flow forecasting is wide, and as the project cash flow forecast process within HygieneCorp is complex and affect several departments, this study must be limited. First, only forecasts in the context of the project management department are analysed. Second, the study only considers innovation projects and the forecasts are only qualitatively analysed to recognize consequences and deviations in the forecast process.

Moreover, no further financial information of overall project cash flows is addressed, which limits the possibility to determine precise effects of accurate or faulty forecasts. Moreover, this thesis only investigate outflows of the cash flow forecasts (not cash inflows). The reason for this is that the investigated division at HygieneCorp (the PMO) only estimate total expenditures for projects and forecast these in time. Further, as analysed forecasts and processes are issued from one company, a generalization of findings may not be possible. As a result, this thesis is rather context- and company specific.

1.5 Report structure

This thesis adopts a funnel structure, where it begins with general information and becomes increasingly narrow. First, Chapter 2, presents an overview of the theoretical framework and prior research within the field (which will later be applied in the discussion of the result). This is followed by Chapter 3, Methodology, which describe how data that underlies the result has been gathered. Chapter 4 presents thesis results, followed by an analysis of results in combination with theoretical framework which is presented in Chapter 5, Discussion. Last, Chapter 6 conclude results and suggests future research areas.

2

Theoretical framework

This chapter form the theoretical framework which is later used to analyse research findings and to form a conclusion. Two perspectives linked to the research questions are in focus: the financial perspective and the innovation project management perspective. First, the literature review provides an introduction to cash flow management and cash flow forecasting. Second, topics related to project management are explained; such as the triple constraint, project management methodologies, and implications of working with innovation projects. Third, the concept of institutional logics is explained. This is followed by an explanation of communication in organizations and knowledge management.

2.1 Cash flow management

Effective cash management is crucial for survival and long-term success of organizations. Managing cash flows allow companies to avoid operational crises due to lack of cash (Reider & Heyler, 2002). Good cash flow management help companies maintain or improve their financial reputation. However, cash flow management requires careful planning and risk assessment for companies not to fall short of cash. An emerging trend within cash management is the development of more active methods for forecasting company cash flow (Sprague, 2017). Sprague (2017) has listed things that affect cash management forecasting, such as: new technology, improved statistical techniques, centralization of forecasting in an organization, and tighter regulatory controls.

In addition to managing cash flow at a company level, it is equally important to manage cash flows in projects (Cui, Hastak & Halpin, 2010). Corcoran (2013) argues that it is important to keep track of both cash flows of the company and of its projects, but that it is at project level that successful cash management begins. If not managing the project cash flow properly, it can cause poor project performance and insufficient sustainability due to lack of working capital (Cui, Hastak & Halpin, 2010). There is not one "best practice" for cash flow management of a project. Approaches and tools should be chosen and adapted according to the nature and complexity of each project (Adjei, Fugar, Adinyira, Edwards & Parn, 2018). Cash flow management has several components, such as forecasting, planning, monitoring, and controlling of cash inflows and outflows (Cui, Hastak & Halpin, 2010).

In cash flow management there needs to be a balance between a company's cash on hand and their short-term investments. A company with stable cash flow management can use their cash efficiently and thus maintain balance. Cash management focus on planning short-term borrowings and short-term investments and forecast

this while trying to maintain the balance. As a result, the cash management process is based on cash planning, which is often based on the forecasts. Surprisingly, there is often little attention on forecasting methods but rather on results compared to forecasts (Francisco, Francisco, Rodríguez-Aguilar, Serrà & Arcos, 2017).

2.1.1 Cash flow forecasting

As it is important to manage cash flows effectively, it is helpful to plan for future in- and outflows of cash. Accordingly, cash flow forecasting is a vital part of cash flow management and the forecasts can be made at both company and project level.

The Business Dictionary (2018) defines the general concept of forecasting as "a planning tool that helps management in its attempts to cope with the uncertainty of the future, relying mainly on data from the past and present and analysis of trends". A forecast should serve as an aid in decision making and in planning of the future. The main gain of forecasting is being able to modify behaviours and plans according to the forecast to be in a better position for the future (Brunel University, n.y.). The Business Dictionary (2018) argues that forecasting is often based on the management's judgement, knowledge and assumptions.

Smith, Herbig, Milewicz and Golden (1996) present eight basic principles of forecasting, which apply no matter which forecasting method that is used. The first principle is *Accuracy of forecasts*, where they argue that forecasts are almost always wrong and that it is rather a question of how wrong. Though, even if cash flow forecasts are rarely accurate, they are still important to do as they are better than no forecast at all (ibid.).

The second principle is *The time horizons of forecasting* which means that the longer time horizon, the less accuracy of the forecast. Smith et al. (1996) argue that things that impact long term forecasts are changes in environment; such as changes in buyer behaviour, competitors' strategy, government regulations and/or technology.

The third principle is *Technological change* which means that as the rate of technological change increase, the accuracy of forecasts decrease. This principle mainly concerns high-tech industries where competitors are constantly changing the market. The more technical change that is taking place in an industry, the larger is the risk that competitors can change the market by technical innovations (Smith et al., 1996).

The fourth principle is *Barriers to entry* which refers to how easy it is for new competitors to enter a market. If there are few barriers to enter a market, there is more risk of forecasts being inaccurate. This is as competitors can change relationships and patterns on the market to change the outsets (Smith et al., 1996).

The fifth principle is *Dissemination of useful information* to competitors. If all have similar information, there is less chance of gaining advantages from accurate

forecasting, as others can have the same predictions (Smith et al., 1996).

The sixth principle is *Elasticity of demand*, which explains that the type of market that a company is operating affects the forecast accuracy. For companies that operate within a market with a steady demand (such as food items), it is easier to forecast the cash flow than if operating a market with non-necessities (such as vacationing), which is more sensitive to for example periods of necessities (Smith et al., 1996).

The seventh principle is *Consumer versus industrial products*. Typically, cash flow forecasts for consumer products are more accurate than those for industrial products. Smith et al. (1996) argue that those selling industrial products are more sensitive as their customers have more power. If they lose a customer, there will be a large impact on the cash flow for sales. These customers are typically also more powerful in negotiations as they can choose other, competing, suppliers (ibid.).

The eight, and last, principle is *aggregate versus disaggregate*. If using aggregate data when making a forecast, there is a better chance of the forecast being accurate. Reasons for that is that more information is available to base figures on. If there is no aggregated data, it is more difficult to make an accurate cash flow forecast as there is not as much previous experience which can be used (Smith et al., 1996).

Furthermore, Reider and Heyler (2002) argue that planning can be the difference between potential chaos and well-based decisions. Companies have a tendency to adopt a short-term focus when doing cash planning, if doing it at all. This helps the daily survival for companies, but it does not benefit companies on a long-term, strategic, basis. The main goal of cash planning is to foresee inflows and outflows of cash and to ensure that there is a positive flow of cash. This can be achieved by comparing the cash plan to actual results in order to learn trends. There are many advantages of doing cash planning, where avoiding surprises is the main point. Planning cash flow makes it possible to ensure that the organization have, and will have, necessary amount of money at the right time. Cash flow planning tools include preparation, cash forecasting, cash planning and cash budgeting (Reider & Heyler, 2002).

2.1.2 Cash flow forecasting in organizations

Since cash flow forecasts can be made at both company and project levels, it is important to understand the differences. It is widely known how essential the ability to accurately forecast costs and revenues is for companies to stay relevant on the market (Billows, 2016; Müller, 2011; Pitkänen, 2016; Reider & Heyler, 2002). It is important that organizations know what cash flows to expect. By knowing this with relative certainty, there is a possibility to plan future events and strategies, and to react in a prospective rather than reactive way. Accordingly, forecasting cash flow indicates if a company will have cash excesses or cash shortfalls, meaning investments and borrowings can be planned (Reider & Heyler, 2002). In short, managing cash

flow well can lead to business advantages as it makes it possible for companies to plan expenditures and loans, allowing optimization of the utilizing funds (Pitkänen, 2016).

Smith et al. (1996) found differences in forecasting processes for companies depending on their company size. Large organizations (more than 500 employees) usually had more employees involved in the forecasting process than small organizations. The forecasting process tended to be more complex and quantitative in larger organizations and fewer executives were involved in the process. Nonetheless, smaller organizations set aside more effort and value in their forecasting process and thus have more “user-friendly" processes (Smith et al., 1996).

2.1.3 Cash flow forecasting in projects

Cash flow forecasting can be argued to be just as important at project level as at company level (Corcoran. 2013). Therefore, it is useful to forecast estimated costs and revenues in a project to plan expenditures, monitor project progress and manage the budget.

One main purpose of project cash flow forecasts is to reduce risk in projects by identifying potential weaknesses connected to financials (Fight, 2005). This is also emphasised by Reza and Bagherpour (2013) who mention that controlling project cash flows help monitoring projects. At project level, cash flows include cash inflows such as earnings received from project execution and cash outflows such as cash shortage, loans and cost of money (Jiang, Issa & Malek, 2011). Moreover, Rajendra (2013) found that the main objective of carrying out cash flow forecasts is that it serves as a basis for determining funding requirements and liquidity usage for a specific project. Therefore, information found in a cash flow forecast is important for the decision-making in projects (Cheng, Hoang & Wu, 2015).

Moreover, Billows (2016) underlines the importance of having sponsor’s and financial managers’ approval of cash flow forecasts (in combination with a project plan) prior to project start. This is as needed resources should be reserved for the project. It is not enough to reserve a full sum for a project as all payments will not occur at the end of the project, and since companies cannot have total sum available throughout the full life cycle of a project. Therefore, it is important that project cash flow forecasts are correct in order to keep borrowings as low as possible, and to enable effective utilization of money. This helps increase returns on excess cash in a company, and it reduces the cost of capital (Billows, 2016). Adjei et al. (2018) argue that financial stress in a project can be avoided by doing an accurate cash flow forecast at the outset of a project. If not having an accurate forecast, there will be an increased level of risk connected to the project (Gumbley & Blahnik, 2015).

As mentioned by Cui, Hastak and Halpin (2010), one aspect of cash flow management is monitoring and controlling cash inflows and outflows. Billows (2016) mentions that it is important to follow up on cash flows each month by comparing

forecast to actual outcome. These regular checks allow quicker response if something needs to be changed to follow the project plan. This is also mentioned by Cui, Hastak and Halpin (2010), who states that is important to monitor cash flows to follow up on project progress. Keeping track of project cash flows is a way of noticing signals of schedule delays and cost overruns (ibid).

In order to gain benefits from using cash flow forecasts there needs to be knowledge of how to make forecasts. Therefore, it is important to comprehend forecasting process and basic principles of making a forecast.

2.1.4 How to make a project cash flow forecast

There are many ways of preparing a cash flow forecast, with varying opinions of which the most effective and accurate method is. Gumbley and Blahnik (2015) conclude that emphasis should be placed on two things when preparing a project cash flow forecast. First, it should look at the timing of costs in a project, which is also emphasised by Park, Han and Russel (2005) as cash flow data is time dependent (Cheng, Hoang & Wu, 2015). Secondly, it should look at how workflows will occur during the remainder of the project (Gumbley & Blahnik, 2015). Further, Liu and Wang (2008) argue in line with Gumbley and Blahnik (2015), that it is important that cash flows are considered in the project schedule as costs of projects are connected to timing of events. If not considering schedule and cash flow together, it may cause budget overruns and project failure (Liu & Wang, 2008).

In project cash flow management, there are several forecasting models that can be applied or used as a guidance. Even though there are several available models for cash flow forecasting, there is no unison as to which model is best. Due to the large number of models available it can be difficult to choose one to use in a company or in a specific project. However, chosen model should have the characteristics of offering fairly accurate forecasts, and at the same time offer flexibility for the financial manager (Khosrowshahi, 2001). The models relating to projects mainly use project cost estimates and schedule data to make forecasts (Chen, Chen & Wei, 2011). Even though there are several different models for cash flow forecasting, real-world cash flows are rarely completely known in advance. This implies that there are certain levels of unpredictability (Francisco et al., 2017). However, to obtain better accuracy of forecasts, Francisco et al. (2017) showed that a use of several different forecast models can result in higher quality predictions and improved accuracy.

As mentioned by Smith et al. (1996) in *2.1.1 Cash flow forecasting*, cash flow forecasts are rarely correct – it is more a question of how incorrect they are. Therefore, it is important to understand some reasons for faulty cash flows.

2.1.5 Reasons for faulty project cash flow forecasts

There can be several reasons for faulty cash flow forecasts. One common reason is that the person preparing forecasts, often a project manager, produces one that is too optimistic. This behaviour can be caused by the will to drive a specific project over another, leading to the project manager's strategic choice of making forecasts optimistic in order to receive project approval (Müller, 2011). It may also be that the person doing the cash flow forecast is unintentionally over-optimistic (Müller, 2011).

Another reason for faulty cash flow forecasts is forecasts being based on inaccurate information (Pitkänen, 2016). One explanation is that changes made in projects may affect a project in several ways through scope, duration, budget and risk (Billows, 2016).

Due to the risks of producing faulty cash flow forecasts, it is crucial to lay a good foundation for the estimations. Typically, capex costs represent a major part of project cash flow forecasts. Hence, it is important that these costs are properly estimated and that long-term impact of these expenditures are recognized in projects.

2.1.6 Capex

Capex stands for "capital expenditures" and includes costs for purchasing fixed and intangible assets, which are categorized as investments on the cash flow statement (Cassis, 2018).

Cassis (2018) has recognized several forms of capex and how they can be financed. For instance, capex can be funded not only from cash flows but from cash on hand, debt or new equity. Yet, capex is treated as if though it was paid with cash flow (Cassis, 2018). Liao, Lin and Lin (2016) argue that capex investments have a long-term impact on an organization. According to Kuznetsov (2018), capital expenditures represents a major part in the economy of for example an organization. This is partly as the investment periods can be more than a few years long. Furthermore, capex is important as it contributes to development, maintenance, replacements and general improvements (Kuznetsov, 2018). These improvements can lead to, for example, better product quality, customer satisfaction, production performance or reduced costs (Liao, Lin, & Lin, 2016).

Besides financial aspects of cash flow forecasts, it is also important to consider some project management aspects. There are several parts included in a project, such as project prioritizations, communication, and other segments that affect the forecasting process, therefore it is essential to understand the project management perspective.

2.2 Project management

Successful project management require considering several aspects involved in a project. For instance, it is important to find right balance between scope, time and costs. Moreover, using a suitable project management methodology can create a good outset for projects and their cash flow forecasts. It is also important to understand how the type of project can affect for example the project cash flow forecast. Moreover, working with innovation projects presents several challenges. Following is a literature review regarding how to manage these difficulties.

2.2.1 Triple constraint

As seen in Figure 2.1, the triple constraint, also known as the iron triangle, constitutes of project scope, time and cost (Furman, 2012). The triple constraint concerns all project managers, both junior and senior. As a project manager, it is important to understand the concept of the triple constraint as well as how its' factors affect a specific project (Dobson, 2004). Furthermore, Dobson (2004) mentions that if projects had unlimited resources in terms of time, cost and scope, most things could be accomplished. However, that is rarely the case. Hence, the principle of the triple constraint apply to nearly all projects.

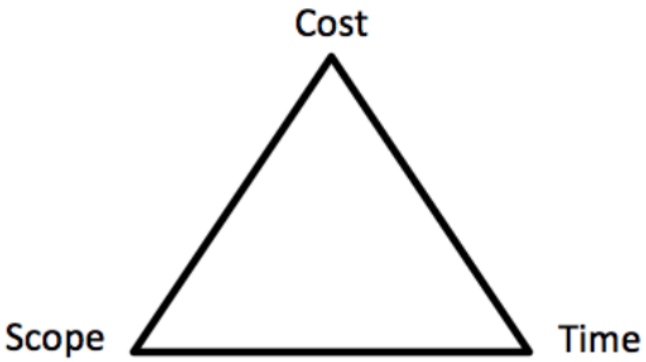

Figure 2.1: The triple constraint.

Furman (2012) argues that the triple constraint is a good tool to use prior project start to make sure that the project is realistic and that it has a good chance to bring value to an organization. Dobson (2004) mention further benefits of the triple constraint such as that it forces project team members to look for hidden resources and opportunities that can be found within the boundaries that the triple constraint sets.

The three aspects of the triple constraint can be divided according to "driver", "middle" and "weak", which illustrates that they are not all equally constraining (Dobson, 2004). The "driver" is the constraint which must be prioritized and that

cannot or should not be compromised on. The "middle" constraint can be somewhat compromised on, and the "weak" constraint has most flexibility. Figure 2.2 provides an example of how decisions in a project to change one of the constraints can affect the other constraints. It is typically not the project itself that decides how to prioritize amongst the three constraints. It is the goal or purpose of a project that will decide how to prioritize. Hence, it is necessary to ask the question of *why* a project is done and which value it is expected to bring (Dobson, 2004).

The Constraint and the Situation	The Effects on the Project	Negative or Positive Result?
Cost: The staffing budget is reduced to cut costs.	**Time:** The schedule is drawn out because fewer workers, or less-experienced/less-qualified workers, can't deliver the same results as quickly as the original team.	Negative
Cost: The client cuts back on the total budget for the project.	**Scope:** The number of features or the quality of the features of the project's deliverables decrease.	Negative
Cost: The budget is increased because hiring more workers might get the job done faster.	**Time:** The project is completed successfully, ahead of schedule.	Positive
Time: The schedule is lengthened so that the deliverable can be enhanced to accommodate additional customers.	**Scope/Quality:** The original plan was to build an application to accommodate one department, but the longer schedule allowed the team to expand the application to support multiple departments, yielding broader benefits than originally planned.	Positive

Figure 2.2: Example of consequences when manipulating the aspects of the triple constraint (Furman, 2012).

Besides prioritizing between the triple constraint and establishing a balance in line with a specific project, it is also important to consider what project management methodology that is used.

2.2.2 Project management methodology

Joslin and Müller (2015) argue that a project management methodology "is meant to enhance project effectiveness and increase chances of success" (p.1377). Additionally, project management methodologies can be used to achieve more predictable project results by supporting project managers (Joslin & Müller, 2015).

Project management methodologies can improve how a project is delivered by providing a structure (The Digital Project Manager, 2017). Wells (2012) argue that project management methodologies can increase efficiency and effectiveness in projects. However, if chosen project management methodology is incomplete or limited it can affect the project outcome negatively (Joslin & Müller, 2015).

Working with innovation and development projects usually involves several levels of uncertainty. During early stages of these projects it is difficult to determine one approach for product development since it would imply higher risk. Therefore, a parallel strategy for the development can improve the overall flexibility to respond to some uncertainties and decrease risk (Wang, 2017).

According to Wang (2017) "the goal of an R&D project is to develop technological solution approaches for improving product performance that can satisfy market requirements of an emerging opportunity" (p.130). To achieve this, Wang (2017) divided innovation projects into different stages where projects are reviewed at the end of each stage. Therefore, at the end of the last stage, when the product is launched, it has been successfully developed (see Figure 2.3).

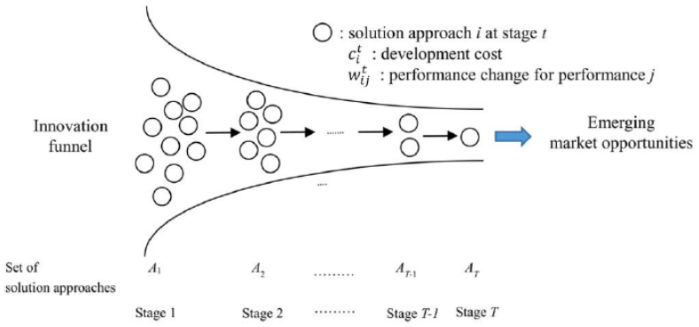

Figure 2.3: The concept of selections for R&D projects (Wang, 2017).

Moreover, Wang (2017) mentions that the business environment is increasingly complex and that competition is growing. Grönlund, Sjödin and Frishammar (2010, pp.106) found that "Procter & Gamble, for example, went from "Research & Develop" to a revised development strategy called "Connect & Develop" aimed at profiting from the use of ideas from millions of external inventors worldwide". Instead of focusing on researching only within the organization, Procter & Gamble connected with other external inventors. Accordingly, a more open approach towards innovations, a so called open innovation, can be beneficial for organizations working with R&D. The concept of open innovation is to use external knowledge to drive internal growth (Grönlund, Sjödin & Frishammar., 2010). Following is a further description of working with innovation projects.

2.2.3 Complexity of working with innovation projects

The project type can affect the forecasting accuracy and is therefore important to consider when analysing forecasts. Working with innovation implies increased uncertainty and project complexity. Olsson, Johannesson and Schweizer (2018) emphasize the importance of right decisions and cost estimations when working with unforeseen events in complex environments - such as working with innovations.

Most common reasons for deviations include conflicts regarding product costs, per-

formance, and time, or conflicts about product cost, quality and customer values. Further, deviations can be related to the tendency to under-estimate project costs to receive an approved project plan. However, the tendency of underestimations is often related to underestimation of risks, lack of proper processes or skills, limited information at hand, optimism bias and/or openness for scope changes (ibid). To avoid underestimations in cash flow forecasts, Olsson, Johannesson and Schweizer (2018) mention that increased transparency, analysis, and provision of costs and unforeseen scope changes can help. Moreover, increased use of data from previous projects can help improve cost estimates at early stages (ibid.).

Furthermore, there are other factors that have a tendency of being cost-drivers. For instance, changes in material or labor price and scope changes are known for increasing costs. Scope changes are often made due to lack of initial information at early project phases or they are initiated by the product development team to avoid risk and failure. Moreover, due to lack of initial information, the risk of cost-estimation errors increases further (Olsson, Johannesson & Schweizer, 2018).

The decision making in innovation projects often require prioritizing between cost, time and scope or performance (Olsson, Johannesson & Schweizer, 2018). For instance, when Olsson, Johannesson and Schweizer (2018) studied a new product development project at Volvo Car Corporation, they found that the decision-making was influenced by the project teams' belief of which factors that are most important. In this case, the belief was that product design and technique were superior to product cost, which resulted in a belief that cost overruns were justified (ibid.).

According to Burton (2011) it is common that organizations have a stage-gate process for product development including: idea/concept, business case and functional specification, product and process development, validation and test, and product launch. However, even though most organizations claim that they use a formal product development process, they tend to not follow that process (ibid.).

As innovation projects increase the complexity in several ways, it also affects the forecasting process. Hence, cash flows are rather difficult to forecast for innovation projects.

2.2.4 Forecasting innovation projects

Even though there are several forecasting strategies and techniques, new product development and innovation projects make it rather difficult to forecast. Kahn, Evans-Key, Slotegraaf and Uban (2013) mention that there is typically low cash flow accuracy when working with innovation and new product development. Furthermore, by using multiple forecasting techniques, the accuracy of forecasts will not necessarily be improved (ibid.).

Another factor to consider, which is making innovations further complex, is the numerous uncertainties involved in innovation projects. To cope with these uncer-

tainties, organizations usually develop a structured new product forecasting process that is built on cross-functional communication, previous knowledge from innovation projects, and feedback from customers (Kahn et al., 2013). Kahn et al. (2013) have identified the importance of assumption management on forecasts. The assumptions must be transparent in order to achieve an organization-wide understanding (ibid.).

Organizations with successful forecasting processes tend to carefully observe (and monitor) their assumptions by establishing a tracking-system to control if forecasts will be accurate or deviate. By establishing transparency toward assumptions, it is easier to understand if forecasts are built on rationalism or optimism (Kahn et al., 2013). Additionally, successful forecasting organizations are generally establishing databases for gathering data so the information can be tracked and reflected upon. Accordingly, data can be used when validating new product forecasts and analysing forecast accuracy of prior and similar projects (Kahn et al., 2013).

The complexity that characterizes innovation projects is one aspect affecting project cash flow forecasts. However, there are other aspects and perspectives on project forecasts that might not correlate. Therefore, it can be useful to learn more about different perspectives or so called logics existing within an organization.

2.3 Institutional logics

The concept of institutional logics is becoming more and more popular and researched (Thorton & Ocasio, 2008). Thorton and Ocasio (1999) have provided a definition of institutional logics, which Besharov and Smith (2014) argue is commonly used by researchers. They define institutional logics as "socially constructed sets of material practices, assumptions, values and beliefs that shape cognition and behaviour" (p. 804). Thorton and Ocasio (2008) argue that institutional logics has become a "buzz word", where the term is used too much and too broadly, leading to the concept losing its focus and "sharpness". Moreover, according to Thorton and Ocasio (2008), institutional logics connects to institutional theory and institutional analysis.

Greenwood, Raynard, Kodeih, Micelotta and Lounsbury (2011) mention two aspects of institutional complexity that need to be considered; first, the number of logics coexisting and second, the incompatibility between those logics. Besharov and Smith (2014) argue that there are always multiple institutional demands to which an organization must respond. This phenomenon concerns various industries, such as healthcare, professional services, social enterprises, and manufacturing.

Multiple institutional logics can often coexist in an organization, but they can cause conflicting goals, understandings and behaviours (Greve & Zhang, 2017). Therefore, multiple institutional logics that are incompatible may generate tension and organizational challenges (Greenwood et al., 2011). Besharov and Smith (2014) argue that there are many opinions amongst researchers concerning whether it is

positive or negative to have multiple logics within an organization. Some associate it with contestation and conflict, arguing that it threatens performance and leads to organizational demise. Whereas others believe that it causes "logic blending" or coexistence, causing organizations to be more innovative, sustainable and enduring (Besharov & Smith, 2014). If looking at case studies, it appears that multiple logics cause conflicts and paralysis in some cases, whereas it is not an issue in other organizations where it may even cause growth (ibid.).

Besharov and Smith (2014) argue that logics, and the relationship between them, change within an organization as they vary across time and context. Multiple logics can display itself in various ways in different organizations. For example, it can show through the core mission and strategy of an organization, or through one logic dominating, making the others less influential. Furthermore, just as well as logics influence people in an organization, the people can influence how logics are instantiated (Besharov & Smith, 2014). According to Friedland and Alford (1991) people in organizations tend to, consciously or not, use logics to support practices or ways of being.

In order to overcome conflicting logics, it is important to establish a bridge between the logics so a mutual understanding can be obtained. Communication can be one solution for achieving this.

2.4 Communication in organizations

The way of doing business and being an organization is changing with globalization, information technology and new organizational structures (towards team-based), causing communication skills to become increasingly important. Bardia (2010) argues that communication today in a business environment must be smart and effective. It is also mentioned that having a good way of communicating can help achieve business goals. This is as communication connects employees and managers as well as it helps channelizing and focusing different functions of an organization in a way that is beneficial. Moreover, communication is important as it can help blend functional areas in organizations (ibid.).

Griffith and Harvey (2001) argue that having strong interorganizational networks is crucial for global competitiveness. These networks are created from effective communication and trying to develop relationships. Constantin and Baias (2015) mention that internal communication in an organization is important as it makes employees work toward common goals and understand work policies. According to Richards (2014), it is important that everyone in an organization is involved to create effective communication. They also argue that organizations should educate managers to improve their communication skills if wanting to achieve effective communication. Richards (2014) have established steps for effective communication in organizations; deciding on a baseline for performance, identify which areas to improve, implement actions for improvement, and lastly measure again.

Bardia (2010) argues that the essence of communication in a business environment is understanding what has not been outspoken. It is important to express both what is known, but also what is "under the wraps". Bardia (2010) also highlights the importance of managers and employees being able to communicate between themselves as a way of being successful in today's growing business complexities. Similarly, Cowan (2014) argues that communication should be done actively and "up, down and across". There should not be a top-down approach as that does not reflect a dynamic and effective way of communicating (Cowan, 2014).

Another aspect of modern organizations is that organizational structures tend to be flatter with fewer management levels. This leads to new ways of communicating as managers are talking with people that they have no formal control over (Bardia, 2010). According to Bardia (2010), the flat organization structure has strong and clear lines of communication, which is an important ground for creating trust, loyalty and understanding.

Further, the more team based way of organizing calls for effective communication amongst team members for each individual skill to come to use (Bardia, 2010). According to Tiferes and Bizantz (2018), a team cannot function properly without communication between team members. The lines of communication between team members must be strong, and it is of outmost important to communicate well with team leaders (Bardia, 2010). Bresnen, Goussevskaia and Swan (2004) mention that there is a contradiction in organizations working with projects as projects strive to meet project task objectives which are short-term, whereas the organization must think long term in terms of organizational learning processes.

Moreover, globalization means that people from different countries and cultures must work together to achieve good business results. Combining various cultures and languages can make communication difficult. What is an accepted way of communicating in one culture (eg. being "straight forward"), is offensive in another. Hence, global organizations tend to have more communication issues. In order to map and more easily predict these issues, a communication audit can be used (Downs & Adrian, 2012).

Bardia (2010) mentions that it is just as important for companies to be able to effectively communicate to outside parties as it is to communicate internally. Cowan (2014) stresses the connection between external and internal communication, saying "all external communication is internal communication, and all internal communication is external communication" (no page, ch 2). They argue this is as employees are communicators that have both formal and informal communication with each other and with the outside world.

Butera (1996) argues that it is crucial for organizations to communicate with their investors. This communication can be done via quarterly reports as investors view this as a good tool. Further, Butera (1996) mentions that investors are constantly seeking information about their investments. Due to this, organizations are trying to find methods to communicate with their investors, as well as methods for balancing

related time and cost issues (ibid.).

Furthermore, Butera (1996) mentions that a company's shareowner base constitutes a "hidden market". This is especially true for companies that produce retail goods or services. Shareholders, or potential shareholders, of a retail company tend to buy their products which allow shareholders to examine the quality of the company's products. As quality is one factor that defines successful companies, this allow shareholders to value their investment (Butera, 1996). Furthermore, Khan, Ismail, Mardani, Zavadskas and Kaklauskas (2017) mention how internet has allowed company information (none the least financial reports) to be spread easily, providing outside parties with timely information that is more easily accessed than before when reports were distributed via physical copies.

2.4.1 Audits of communication in organizations

Downs and Adrian (2012) argue that communication is often taken for granted, until there are issues. They suggest this problem is addressed by keeping periodic monitoring on organizational processes. This is as members of organizations need to know which operations that are working well and which that are not. Auditing is one way of beginning to understand and improve the communication in an organization (Downs & Adrian, 2012). Hence, this will be touched upon to provide understandings of the general concept. In this section, the view of Downs and Adrian is presented due to their experience and the importance of their work.

An audit is a process of examining, monitoring, exploring or evaluating something and for communication in an organization, audits should be done regularly. A communication audit looks at employees' tasks and interactions and puts them into a wider context of interactions. According to Downs and Adrian (2012) there are six phases to an audit: initiation, planning, diagnosis or fact finding, analysis, evaluation, and feedback. It has been argued by Downs and Adrian (2012) that audits are a growth experience for an organization.

There can be several benefits from assessing communication in an organization. For example, it supports strategic planning, it help generate new data, and it allow benchmarking (both internal and external). It also rise awareness of effective communication amongst employees (Downs & Adrian, 2012).

When assessing the communication of an organization, the following aspects should be considered: *independence*, *professionalism*, *diagnostic thoroughness*, *skilled evaluation*, *tailored design*, and *current time frame* (Downs & Adrian, 2012).

The aspect of *independence* means that a person who is external to the organization should perform the audit. *Professionalism* refers to that the person performing the audit must be professional, meaning they should have training in organizational dynamics, knowledge of how to analyse organizational communication, and an understanding of the processes of consultation (Downs & Adrian, 2012).

Moreover, Downs and Adrian (2012) mention that *diagnostic thoroughness* refers to that it is important that the diagnosis is done in a skilled way to provide a realistic and usable understanding of the organization's strengths and weaknesses in relation to communication. If the audit would not be done in a thorough way, the proposals for change would not be appropriate to use. Therefore, produced results should not be biased or adapted to solutions that consultants prefers to use (ibid.).

Skilled evaluation signifies that in evaluation, there must be criteria to measure by. These criteria can be based on various things, such as the consultant's wishes, comparisons in the organization over time, managements wishes, or other. By using the same criteria over time, it is easier to see the development of the organization (Downs & Adrian, 2012).

Furthermore, the aspect of *tailored design* explains that methodology and criteria used for an audit must be adapted to the specific organization. Meaning that while the auditor can benefit from previous experience, they cannot simply use the same methods that have been used in other organizations (Downs & Adrian, 2012).

Lastly, the aspect of *current time frame* describes that the audit is a snapshot of an organization at a certain time. As organizations are constantly changing, results from an audit will only be relevant for a limited period. Hence, Downs and Adrian (2012) advice that audits on the communication in an organization should be done about once per year.

Besides improving the communication within an organization, knowledge management can also be used to bridge between different institutional logics. This is achieved by diffusing the knowledge within each function and cross-functionally. However, sharing knowledge can be rather difficult when the knowledge resides within employees (Downs & Adrian, 2012).

2.5 Knowledge management

It can been argued that "knowledge is power", making it important for organizations to have access to knowledge. However, some knowledge and expertise reside in employees minds as "tacit knowledge" (Dietel, 2017). Leonard and Sensiper (1998) explain that "subconscious or unconscious tacit knowledge produce insight, intuition, and decisions based on "gut feel"" (p.113). Further, Hislop (2013) mention that most organizational knowledge is tacit knowledge that must be converted to explicit knowledge.

The knowledge sharing process is different depending on the type of knowledge, if it is tacit or explicit. The process for tacit knowledge sharing is complex in comparison to explicit knowledge sharing. Therefore, knowledge should be converted to explicit knowledge to establish successful knowledge management. The gathered explicit knowledge should then be categorized, structured and gathered in one place, such as a common database, in order to make the knowledge accessible (Hislop, 2013).

The probability of sharing information or knowledge depends on the nature of the knowledge and the relationship between employees (Bostrom, 1989; Ma, Qi & Wang, 2008). One important difference between tacit and explicit knowledge is that explicit knowledge promotes knowledge sharing while tacit knowledge creates barriers for sharing knowledge. Tacit knowledge is often more complex and complex information tends to be more difficult to share (Ma, Qi & Wang, 2008). However, if a trusting and respectful relationship is established between employees together with mutual understandings, the knowledge sharing is more likely to be effective (Bostrom, 1989).

3

Methodology

This chapter introduce the research approach and methodology used to collect data. A qualitative approach was applied, and the research was conducted as a single case study.

3.1 Research approach

This research aimed to explore how company routines and processes affect cash flow forecasts in innovation projects. By innovation projects, this thesis refer to complex innovation projects with high levels of uncertainties. The research focused on behaviour and other patterns connected to forecasts. To answer the research questions, a qualitative approach for gathering data was used as suggested by Bryman and Bell (2015).

As the purpose of this research was to explore why deviations occur and how they can be managed, the research approach was designed to extract qualitative data that provided tacit understandings of issues and insight in cultural activities (Tracy, 2013). The research also investigated observed behavioural patterns and employees spoken or written words (Taylor, Bogdan & DeVault, 2016).

Moreover, the qualitative method focused on the information that could be withdrawn from what people did, or said that they did (Gillham, 2010). Hence, qualitative data in this research was extracted from research participants through interviews, internal documents and observations (Easterby-Smith, Thorpe & Jackson, 2015). This was prepared in advance by preparing, conducting and transcribing interviews, together with processing observation notes (Easterby-Smith, Thorpe & Jackson, 2015).

By applying a qualitative method, the research could attempt to make sense of, and understand, complex phenomenon such as project cash flow forecasting processes, by analysing behaviours within the organization and their employees. In this study, this was mainly achieved by analysing four key sources of data; talk and speech, documents and texts and observations (Greenfield & Greener, 2016).

3.2 Research design

Flyvbjerg (2006) points out that the research should be problem driven rather than method driven and that the method that is best suited to answer the research questions should be chosen. To obtain an overview of the forecasting process, in-

terviews and observations were primary data collection methods. The single case study methodology also made it possible to gather data from HygieneCorp's internal documents.

A case study strives to find answers to the research questions by investigating an area in depth such as a group, institution, industry or company. The answers and evidence for the research questions was to be found within the investigated area. Also, the purpose of the research was to extract new knowledge by making sense of found evidence (Gillham, 2010).

As it was the project cash flow forecasting process that was studied, the case study research was of an explanatory type (Noor, 2008). Further, Noor (2008) argue that the case study method is intended to study a unit or issue in order to understand activities and processes of a real-life, complex, situation. Accordingly, the case study method was not intended to focus on the entire organization. However, a case study methodology is useful when there is a need for an in-depth understanding of a specific phenomenon or problem, such as the cash flow forecasting process (ibid.).

In sum, the case study approach was suitable due to the context around investigated area and the possibility of obtaining in-depth understanding of the context around deviations (Noor, 2008).

According to Bryman and Bell (2015), the research questions affect the entire research process, which makes well-formulated research questions highly important for research success. The research questions will direct the literature review, give guidance to appropriate research design and help the understanding of what data that needs to be assembled and from whom (Bryman & Bell, 2015).

3.3 Research process

The research was a process with several steps; planning, literature review, exploratory interviews of semi-structured type, observations, internal document review, in-depth interviews with key involved employees, and an analysis process. This study changed direction several times during the research. This was due to new findings discovered about the project cash flow forecasting process at HygieneCorp, which led to realizations of which areas that would be most relevant to research. The overall research process used to accomplish this research is illustrated in Figure 3.1.

The first step, was setting a research scope together with the supervisor at HygieneCorp. This was done in the beginning of May of 2018 when the scope was narrowed to how the cash flow forecasts could be improved. The research topic was further introduced, with problem formulation and expectations on the research, in the end of August of 2018 when the research began.

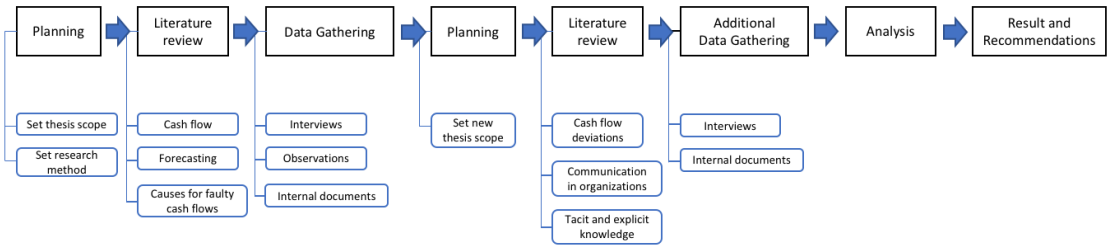

Figure 3.1: Research process.

After the research scope was understood a literature review was commenced to understand research areas and previous research within the field. The literature review contributed to the theoretical framework as well as it built knowledge and improved the understanding of the area. During the literature review, interesting areas and topics were noted in order to direct future research and to find interesting areas to investigate in the data gathering.

Once the scope was set and problems defined, research questions were formulated and the methodology for collecting data was selected. Then the empirical data could be obtained. HygieneCorp held some introductory meetings with different functions as well as some internal meetings between different departments that could be observed. Data was also obtained from internal documents retrieved from HygieneCorp's intranet.

The interviews were prepared in advance and available interview time and place was booked in an internal booking system depending on the accessibility of the interviewees. Prior the interviews, all interviewees were informed about research purpose and main focus areas that the questions were structured around. Most interviews were face-to-face, but some were conducted via Skype calls due to employees being located in other cities.

After some interviews when the context of research area was further understood, the research shifted course as it was discovered that another area was more important than the forecast process itself. Accordingly, the research scope was updated and an additional literature review was once again commenced, new research questions were developed and additional interviews took place.

The data analysis was a continuing process throughout the data collection. However, after completion of data gatherings the data was further categorized and compared to literature findings. Similarities and gaps between literature and data were discussed and analysed. This led to further questions and additional interviews to gain another perspective on forecast deviations.

After all data was collected and analysed, conclusions emerged and recommendations for HygieneCorp could be developed. The research findings were discussed and verified with the supervisor at HygieneCorp throughout the research process to

avoid misinterpretations. The supervisor from HygieneCorp was present during most interviews in order to contribute with another perspective and reflections from someone with further knowledge of HygieneCorp.

3.4 Literature review

The literature review is useful to challenge, extend or prove a gap in prior work in the field (Gill & Johnson, 2010). In terms of this thesis, an extensive literature review was conducted to obtian right background information and to understand the research field. Moreover, the literature review provided information which made it possible to better comprehend the research problem (Graziano & Raulin, 2014).

By using prior literature and information about the field of interest, research questions and other ideas could be further formulated. Moreover, the literature review emphasized the importance of the work by displaying relationship of the work to previous research in the field and thus make the research more relevant and timely (Graziano & Raulin, 2014). Therefore, the literature review is of an explanatory type as the exploration will be conducted later in the data gathering and analysis of data (Wisker, 2012).

Throughout the study, the literature review was a continuing process as new discoveries could be found later in the research (Easterby-Smith, Thorpe & Jackson, 2015; Wisker, 2012). The searching for literature has been done both via Chalmers library and online libraries, such as Chalmers lib and Google Scholar. These findings were later linked to the field of research by merging patterns and arguments from literature with theories from the field. This link was also discovered from discussions with employees, interviews or through visualizations from mind-maps (Wisker, 2012).

3.5 Data collection

Data was gathered by using a mixed approach of interviews, observations and internal documentation from HygieneCorp. The study included ten interviews with four senior project managers, one junior project manager, one manufacturing controller, two head of treasury, one professor teaching financial management, and one former senior project manager and chief operation officer from an outside organization.

All interviews were semi-structured with a focus on project cash flow forecasting. The interviews were both face-to-face and conducted through Skype and lasted between 30 minutes and 2 hours. The choice of semi-structured interviews made it possible to approach each interviewee differently and allowed flexibility during the interviews, as suggested by Noor (2008). Semi-structured interviews also made it possible to obtain in-depth understanding of the research context (Saunders, Lewis & Thornhill, 2016).

The interviews made at HygieneCorp were conducted with well-informed employees from different departments who all had key insight of the cash-flow forecasting process. This includes members from treasury department, the manufacturing controller and several project managers; both senior and junior. The interviews made outside HygieneCorp were all relevant for the research area of project cash flow forecasts. One interview was made with a professor teaching financial management with prior knowledge of project cash flows and another interview was made with a senior chief operation officer who previously worked with improving the cash flow forecasts for another organization.

Data was also collected by observations to gain information that was difficult to withdraw from interviews. The observations provided further understanding and insight about forecasting problems and phenomenon around the problems (Noor, 2008). Observations were made during two quarterly meetings where each meeting lasted for about 30 minutes. These meetings had the purpose of following up on cash flow forecasts with the manufacturing controller. Another observation session was made during a meeting with several employees from the financial department discussing project cash flow forecast accuracy for the department investigated in this thesis. The observations were written down in notebooks and then later processed into comprehensive thoughts (Easterby-Smith, Thorpe & Jackson, 2015).

Moreover, Hygiene Corp's internal documents were used when possible to complement interviews and observations as the documents can show if people actually do what they say and if they follow company guidelines. This improved the reliability of interviews and observations and the trustworthiness could more easily be validated (Noor, 2008).

3.6 Data analysis

The data analysis was a continuing process during the research. According to Liamputtong (2009), it is valuable to begin the data analysis early to allow the research to move and change direction. Hence, the data analysis was an ongoing process where data was analysed during and after data collection.

During interviews, if a thought or reflection raised, it was documented and discussed during interviews. All interviews were tape-recorded (with permission) and after the interviews the data was first transcribed and then categorized. Each interview got a separate colour to distinguish the interviews from each other once the analysing began. Further, the data was categorized into different areas and reflected upon which sometimes led to new ideas. This started a so-called coding process (Liamputtong, 2009; Miles, Huberman & Saldana, 2013).

Miles, Huberman and Saldana (2013) noted three activities of data analysis; *data condensation, data display* and *conclusion verification*. Accordingly, in this report, the data was first processed and condensed to make the data into more developed

field-notes and thus making the data sharper in order to make conclusions (Miles, Huberman & Saldana, 2013). The data condensation took place directly after data gatherings, meaning the information was "fresh" when the coding was analysed.

3.7 Research quality

In quantitative research the quality can be concluded as reliable, objective and generalizable. Qualitative research quality, however, is not as easy to evaluate and must manage bias more carefully (Klenke, Martin & Wallace 2016). Further, qualitative research is more difficult to replicate since the research is conducted in a specific setting at a certain time and lacks external generalizability. However, qualitative research contributes with the uniqueness of the research rather than research comparability that quantitative research provides (Easterby-Smith, Thorpe & Jackson, 2015). Accordingly, external reliability is limited since the research is built on HygieneCorp's specific context and it is thus difficult to adopt the research to other organizations. However, organizations with a similar setting can perhaps adopt parts of the research.

The interpretation of data can be biased since the interpreter perspectives can shift depending on the one performing the interviews. Therefore, both researchers were present during all interviews and even the supervisor from HygieneCorp attended most interviews to avoid one-perspective-interpretation. The formulation of interview questions was also thoroughly prepared in order to avoid prejudice that could direct responses.

The presence of the supervisor from HygieneCorp during the interviews could also affect the information. For instance, it could affect information received from interviewees as they might not have been comfortable sharing certain information.

Further, the research was dependent on availability of resources for interviews. This was sometimes troublesome once the research changed direction and interviews from other departments were necessary but difficult to obtain. This could hinder further understanding of different perspectives on the research area and thus limit the research approach.

Moreover, there are ethical issues that should be considered when conducting the research. To consider ethical aspects in the research, some actions were taken. All interviewees were informed about the purpose of the research and interviews. The research participants and HygieneCorp's anonymity and confidentiality has been kept and information gained from interviews has not been shared between them. Accordingly, the research participants privacy has also been preserved (Easterby-Smith, Thorpe & Jackson, 2015).

To gain further knowledge if the data from interviews was corresponding to reality, one pilot project was investigated to compare information with actual outcome. However, since little data was stored from previous projects regarding their cash

flow forecasts and actual spendings, it was difficult to generalize findings from the pilot project. Yet, the pilot project improved the understanding of the context of research area. Nonetheless, if more quantitative data would have been available the data could have been compared and different trends could have been visible which would have improved the reliability of the data.

One complication when conducting this research was that it was troublesome to find people to interview, even though project cash flow forecast accuracy is an important and currently highlighted issue at HygieneCorp. Hence, it might have been beneficial to send the interview requests at an even earlier stage to ensure availability of resources.

As HygieneCorp is such a large organization, it was quite late into the study that it was realized that each part of the organization only holds a small and specific part of the puzzle that is project cash flows. This means that to have a complete understanding, all these pieces would have to be gathered.

4

Results

This chapter will provide the findings from case study and form the results for this thesis. The results will be presented in the same order as the research questions but starting with a background that is useful for understanding of further results.

4.1 HygieneCorp's background and routines

The project cash flow forecasting process at HygieneCorp is extensive and involves several departments. To comprehend all processes, different areas linked to the forecasting process must be understood. Therefore, it is helpful for further comprehension to consider some background areas including; PMO department, project organization and responsibilities, HygieneCorp's project management methodology, project budgets and some financial aspects of project cash flow forecasts.

4.1.1 Project management office

The Project Management Office's (PMO's) mission is to communicate a best practice for project management at HygieneCorp. As there are different types of projects carried out within the organization, most are managed at their respective department. However, projects that are complex, have a major business impact, have high risk and have a capex with a large supply chain impact, are managed by the PMO.

In general, projects managed by the Project Management Office Project Managers, PMO PMs, are those that are strategically important, that needs extensive coordination and that require highly qualified project managers.

The PMO PM is assigned to a project once it has been accepted for further development and launch. Accordingly, projects are transferred from an innovation team to the PMO PM during final development phase (see *4.1.3 Project management methodology*). However, it is not unusual that the PMO PMs are involved earlier than the methodology suggests.

4.1.2 Project organization and project responsibilities

As HygieneCorp is a large organization, there are many people and business units involved in project cash flow forecasts. Figure 4.1 illustrates a simplified and generalized organization chart of HygieneCorp from a project cash-flow forecast perspective. Only people and departments most relevant for creating and following up on PMO

project cash flow forecasts are included. The following text is a further explanation of the departments and roles shown in Figure 4.1.

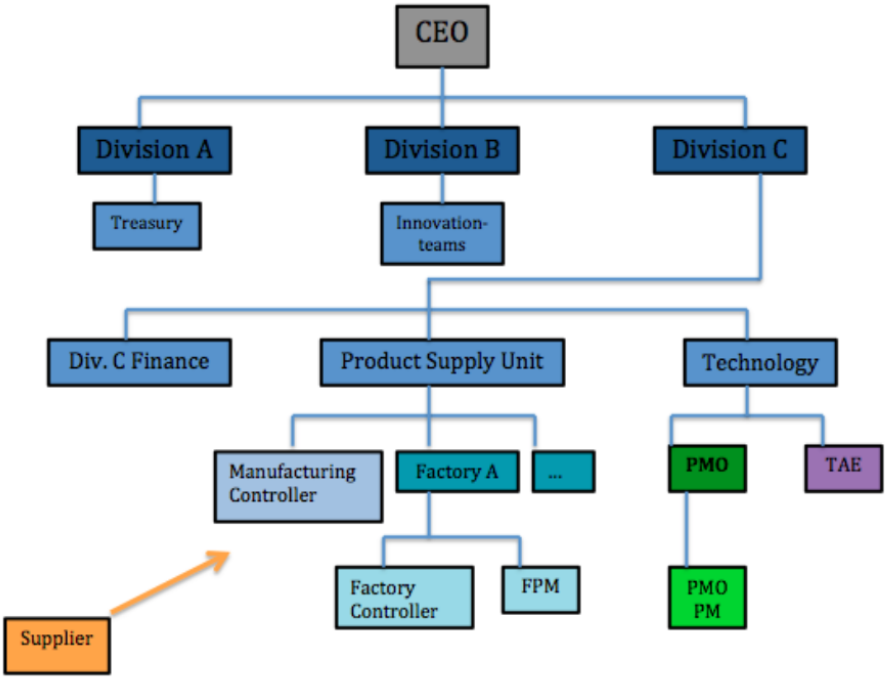

Figure 4.1: Organizational structure at HygieneCorp, containing departments that are most concerned with project cash flow forecasts.

The CEO is responsible for making major business decisions, even for some projects, such as approving large-sum capex requests and deciding on major changes in strategically important projects. The CEO is supported by the board of directors.

HygieneCorp have several divisions but the most relevant divisions for this thesis will be called Division A-C. *Division A* is the financial department, which is responsible for the economics for the entire organization. *Division B* is the innovation division with a main function of developing and working with product innovations. *Division C* holds most functions relating to the PMO and their projects; for example Division C Finance, Product Supply Unit, and Technology. Further is a description of *Division C* as they are most concerned with project cash flow forecasting.

Division C Finance have the general responsibility for all financials at the division's supply unit. This includes working with for example assets, working capital, profitability, and investment requirements.

The Product Supply Unit, in *Division C*, is responsible for managing and optimizing HygieneCorp's supply chain within *Division C*. Furthermore, the manufacturing controllers' task is to keep track of the financials of factories, which includes for example to keep track of project investments and depreciations. The factories are involved throughout the entire projects, though, they become increasingly involved over time. There are many roles within the factories. However, for project cash flow

forecasts, the FPM and the factory controllers are most central. This is as they work closely with PMO PMs and technical experts at the technology department to create project specifications, estimate capexes and make cash flow forecasts. They are also involved in cash flow follow-up throughout the project.

The technology department and their TAEs (technical area experts) help produce a technical requirement specification for the project. It is important that the technology department and the factories collaborate and work closely together. One interviewed PMO PM mention that they mainly work with TAEs when producing a capex request and cash flow forecast, whereas another interviewed PMO PMs mention working more closely with the FPMs and factory controllers when doing this.

The PMO is located within the Technology division. Project managers working at the PMO are responsible for coordinating projects; such as project process, involved managers and other employees. Accordingly, PMO PMs must use several resources from the organization to complete projects. PMO PMs coordinate several other project managers from various departments that are part of a project. It is the PMO PMs that is responsible for cash flow forecasts of projects, but the sponsors have ownership of the projects.

Each project have a project sponsor who have the final sayings in terms of project scope, budget and time. However, the budget must be approved according to a decision structure that is explained in *section 4.1.4 Project Budgets*. A project often has a steering group consisting of important stakeholders, but the project sponsor has final authority. When a project plan has been approved by a sponsor, the PMO PM has the authority to make changes and decisions in line with the project plan. PMO PMs can also bring forward recommendations to sponsors and the steering group when changes are required or desirable. The sponsors are not included in Figure 4.1 as they are placed in various parts of the organization.

4.1.3 Project management methodology

HygieneCorp apply two types of project management methodologies; PRIME and Innovation Funnel. PRIME is a general project management methodology that is flexible and can be used for various types of projects. The innovation funnel, however, is a project management methodology that is built on PRIME but adapted to innovation projects.

As the PMO often manage innovation projects, they mainly use the innovation funnel project methodology. The idea behind this methodology is that the process should work as a funnel where uncertainties and scope are narrowed as the project progresses.

As presented in Figure 4.2, the innovation funnel has four phases; *feasibility, development, capability and launch*. There are also several tollgates (check-points) during

the project; TG1 at the *feasibility phase*, TG2.1-2.3 at the *development phase*, TG3-4 at the *capability phase* and TG5 at the *launch phase*. During the feasibility and development phase, all projects are developed by an innovation team with a separate budget for their innovation department. The PMO department typically becomes involved at TG2.3. This is also when a PMO PM is supposed to be assigned for the projects.

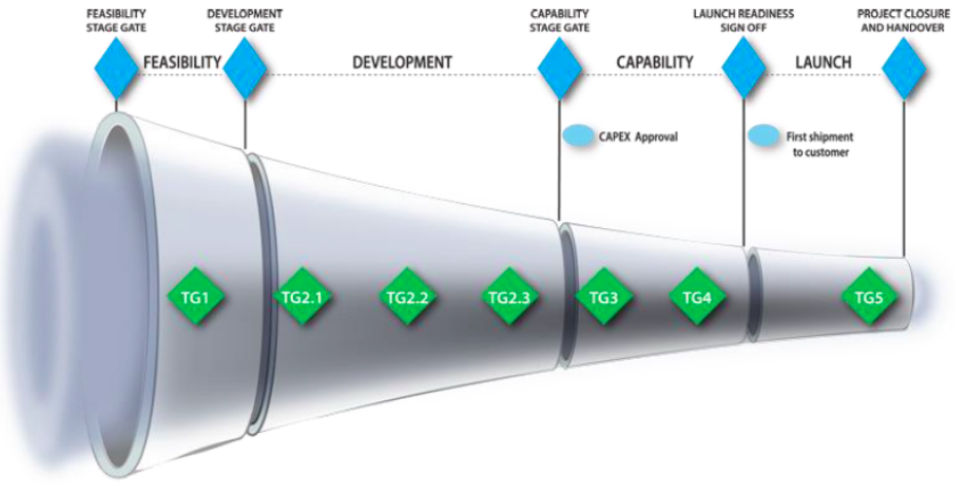

Figure 4.2: Innovation funnel (internal document "Innovation Funnel Process").

As the PMO PM estimates the project budget in a capex request, the budget for projects are first estimated during TG2.3. TG2.3 is also when a project sponsor approve that developed solution is validated with the customer or consumer, that a capex request is ready for approval and that the innovation project is ready for the *capability phase*.

4.1.4 Project budgets

There are three different budgets involved in innovation projects; the *R&D budget*, the *capex budget* and the *running-in budget*. The differentiation of budgets is mainly due to tax purposes as all expenses cannot be capitalized. The R&D budget is a general budget for the innovation division which includes innovations for all product lines. There is also a capex budget for projects that will be further developed and launched. The capex budget represents approved capitalized budget for a project and includes expenses that can be capitalized. Finally, there is a running-in budget for project expenses that cannot be capitalized.

The *R&D budget* is an annual budget for the innovation division. This money is reserved for developing existing or new products and innovations. Accordingly, the R&D budget is the budget for all product categories and the purpose of this budget is to continue improving and innovating products. However, if an innovation product is approved for future development, some parts of the R&D budget for that product

can in certain cases be transferred to the capex for that project. Nonetheless, these are only costs that can be capitalized and directly applied to production segments. Therefore, the R&D budget is mostly managed as a separate budget and is therefore not considered in a project plan (as the capex and running-in are).

The *capex budget* is the budget for expenses that can be capitalized and that, in accounting terms, can be written off. This includes machinery and other parts included in production. The estimated capex budget for a project is decided by an approval process which involves project sponsors and steering groups. Included in the capex request is budget, deadline, forecasted cash-out plan and other project specifications.

The first step when estimating a capex budget, is to prepare a capex request. A capex request is an estimation of required capital expenses for a project and is managed as the budget for a project. The PMO PMs are responsible for estimating required project capex which is typically achieved by applying prior knowledge from similar projects together with input from technical experts, factory representatives (FPMs) and supplier quotations. Accordingly, different departments are involved with their expertise, contacts and experience to estimate costs. The PMO PMs use received input together with their "gut feelings" to estimate the capex for each projects. Once the capex request is ready for approval, the PMO PM present it to the project sponsor. At HygieneCorp, all project sponsors take each proposal through a decision process where decision makers will either approve or disapprove fundings for the project.

In some urgent projects, where time is limited and production needs to start immediately, even when the scope is unknown, a pre-capex request can be made. A pre-capex is an early capex-request that is less extensive. However, an ordinary capex request mst still be approved at a later point.

As long as the project is managed according to project plan, as specified in the capex request, the PMO PMs are allowed to handle projects as they like. However, if project scope changes, the project plan must be updated. This is done by issuing a change request which must be approved by responsible project sponsor. Some examples of changes that require a change request is; further machine changes due to additional customers, a new product range, and adding new markets which requires more capacity and machinery. Since the project terms have been changed, the "contract", capex request, should be updated accordingly. In a change request it should be explained how the changes will affect time, budget and risks. However, how the changes affect cash flow forecasts are not included which hinder sponsors and steering group to fully grasp the impact of suggested changes. Moreover, it is not required that the change request should be submitted, and sponsors seldom request it. However, if the changes will result in expenditures worth more than 5% of the budget as stated in original capex request, a new capex request must be done and approved by the project sponsor and by the steering group.

The *running-in budget* includes expenses that are part of a project. However it solely

includes direct costs which cannot be capitalized. An example of when the running-in budget is used is when a machine has been installed and is running as specified in the contract, but produces some waste of products or material. However, the running-in budget is used during later stages when there is little, or no, capex cost left in the project. Therefore, the capex budget and running-in can be overlapping as presented in Figure 4.3.

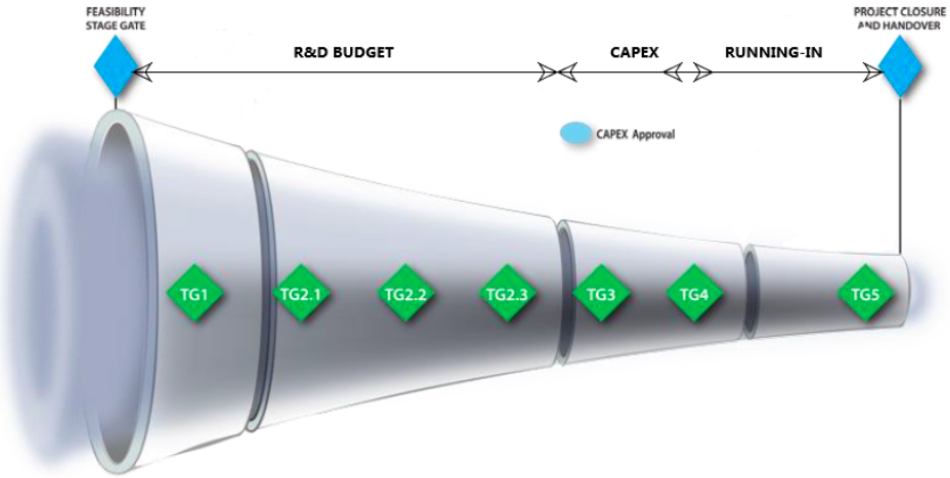

Figure 4.3: Innovation funnel and project budgets (internal document "Innovation Funnel Process", with own modifications; the phases of the innovation funnel have been replaced by the budgets).

4.1.5 Treasury aspects on project cash flow forecasts

The treasury department are working with financials for the entire organization. This indicates that they have a zoomed-out perspective.

The treasury department pay invoices and plan for the future in terms of financials; both short-term and long-term. For project cash-out plans, treasury can only see booked payments and cannot distinguish between payments from different departments of the organization. Hence, payments are not divided to each product-line either. These processes are done at "lower" levels in the organization.

HygieneCorp must sometimes take loans to manage short term cash flows. This is done by treasury on a daily- or weekly basis and invoices that are booked as incoming and signed, will be planned for payment. However, estimated costs and invoices that was included in a project cash flow forecast but not received, are not considered and paid for.

4.2 Cash flow forecasting in innovation projects

HygieneCorp has recently placed more focus on their project cash flow forecasts and deviations that occur. Therefore, as a first step, this thesis investigated HygieneCorp's forecasting method.

4.2.1 Making the forecast with cash-out plan

The first step when preparing a project cash flow forecast is to estimate total costs for the project in a capex request. The total costs estimated in the capex request will then be managed as the project budget, as seen in *4.1.4. Project budgets*. The total cost should also be divided to each quarter of the project lifetime, which creates a project cash-out plan or a so called project cash flow forecast. Even though the capex request is a standard form that must be submitted and approved, there are no routines or common procedures to estimate costs or to forecast quarterly payments. Therefore, PMO PMs have different strategies and routines for estimating costs (both amount and cash-out dates). Using *"gut feelings"* or guessing together with colleagues from other departments and technical experts are common ways of estimating costs. Moreover, there is often little that is known about project scope or other outsets when the capex request is made during the development phase, and it is common that several aspects are unknown until the capability phase of the innovation funnel.

It is the PMO PM who is responsible for making a cash flow forecast, managing it, updating it, and for following up on results. When estimating the capex and forecasting expenditures in time, the PMO PM use input and information received from other departments such as the FPM and technology experts. Most PMO PMs mention that they try to question numbers that others are presenting them with in order to do what they can on their part to assure that figures are best possible guesses. Further, as there are several departments involved in projects, the PMO PM receive support and input from others. The FPMs receive invoices for projects and book them in SAP, HygieneCorp's financial computer system for invoices. This is as factories have better insights of actual spendings since they receive machines and other parts that are included in projects. Due to this system it is important that the FPMs and the PMO PMs are well informed about deviations in project cash flow. Especially as there are no standardized tools for the PMO PMs to use to follow up on cash flows.

There are possibilities for each division at HygieneCorp to document and store knowledge. The purpose of storing knowledge is to improve the knowledge sharing so employees can learn from prior projects and save time and costs. However, the trend is that most PMO PMs tend to ask their colleagues for help or advise if needed rather than to search for stored information. Two interviewed PMO PMs argue that it is not always beneficial to have too much faith in past projects as each project is unique, especially innovation projects. However, they mention that some general

knowledge from previous projects can be used occasionally.

Moreover, the manufacturing controller mentioned that more junior project managers at HygieneCorp often fail to put enough focus on project financials. There is usually more focus on meeting scope and time aspects of the triple constraint. Consequently, the manufacturing controller argues that due to this focus, some project managers tend to put less energy than needed into the cash flow forecasts in regard to wanting more accuracy. However, this varies between project managers.

It was mentioned by the manufacturing controller that there seems to be a belief amongst project managers that if money is accounted for in the project cash flow forecast, they are reserved for the project. Each project has an approved project budget, a capex, and how spendings are estimated in time will neither decrease nor increase the total budget. Therefore, it is always the most realistic forecast that should be submitted. Moreover, the manufacturing controlling department have found a trend that cash flows tend to happen later than proposed in the project cash flow forecasts. Due to this, they make central adjustments for all forecasts to make them more likely to be realistic. One interviewed PMO PM mention doing a "reality check" when receiving figures from others in the project team to make sure that provided figures are most realistic. The tendency is that people add a little extra to their forecasted figures, which in the end results in larger sums for a project. This can disrupt other activities within the project since it provides an illusion that there is a shortage of money.

One senior PMO PM argues that the prioritization of accuracy in project cash flow forecasts tend to fluctuate over time at HygieneCorp. At points, forecast accuracy has been highly prioritized with demands from upper management to improve the forecasts. However, reasons for increased focus on forecasts seems to not be thoroughly communicated to, and understood by, employees. Currently, the accuracy of project cash flow forecasts has gained more focus and discussion. An important reason for this is that HygieneCorp has been listed on the stock market. This has made them more sensitive to how they are perceived. One PMO PM argues that the increased focus seems to make both PMO PMs and FPMs put in more effort when preparing and following up on project cash flow forecasts, leading to improved cash flow forecast accuracy. However, improvements are limited to things that PMO PMs can affect. Hence, not for example fluctuations or changes on market that causes changes in projects.

4.2.2 Project cash flow follow-up

The cash flow forecasts are updated quarterly for all projects; in January, Mars, June and September. Even though the PMO PM is responsible for the project cash flow forecast for a project, it is typically the FPM who reports it to the manufacturing controller. Due to this communication structure, it is important that the PMO PM and the FPM are well informed concerning status of project cash flow forecasts before they are submitted, as they may have different views or different information

concerning a project. Most PMO PMs also report in-between the quarterly meetings if any major changes have happened.

In each quarter, when the PMO PMs provide the manufacturing controller with the latest cash flow forecast, the controller tend to ask questions about figures and the timing of them. This is to remind project managers of their responsibility, make them reflect on quality, and to give them a chance to double check if all inputs are correct.

Furthermore, the interviewed manufacturing controller argues that the current time spent on following up on cash flow forecasts for projects is enough. However, the manufacturing controller expects the PMO PMs to inform if there are any changes in projects that will cause large impact on the cash flow forecast. However, there are no clear routines, resulting in some PMO PMs doing this, and some not. One PMO PM mentions, in line with the interviewed manufacturing controller, that it would not be useful to report to either the manufacturing controller nor to the treasury department in-between the quarterly meetings as it would be too time-consuming to take care of all information.

According to several PMO PMs, there is a lack of transparency between factories and PMO PMs. An example of this is that the FPMs register all invoices for projects but PMO PMs do not have access to documents where this is done, leaving them with having to trust the FPMs. Most interviewed PMO PMs mention that the documents with registered invoices holds too much information for them to have time to go through it. Yet, the fact that they do not have the possibility to access these documents if they want to check, concerns some.

Moreover, the FPMs follow up on cash flow forecasts since they have access to all figures from invoices. This documentation can be provided to the PMO PM. However, factories and FPMs have different templates when doing follow-ups, making it sometimes difficult for the PMO PMs to understand all information. Some PMO PMs do not see this as an issue as they believe it is important to trust co-workers and their abilities. However, other project managers see the lack of transparency between factories and the PMO department as an issue as it makes it difficult to keep track of projects and their development in terms of cash flow.

As well as there can be argued to be a lack of transparency, there are also signs of lack of communication within HygieneCorp. One interviewed PMO PM argues that communication about changes and why they happen is something that must be improved. There is no common template for documenting when following up on project cash flow forecasts, leading to usage of own-constructed and different formats. This can be said to cause issues and poor communication as it is difficult for others, also within the project, to understand and follow the cash flow forecast.

Due to the large size of HygieneCorp, there are several functions and many business units involved in projects. It was mentioned by a PMO PM that it sometimes feels like there are different perspectives in the organization, making employees work

towards different goals. The same interviewee argued feeling that there is some tension, as each department want to achieve their goals which sometimes causes people to make choices that are not beneficial for the organization as a whole. Further, the PMO PM mentioned a feeling of departments not understanding each other's situations and points of view.

Another interviewee argues that HygieneCorp has been reorganized in the past few years which made it more difficult for top-management to properly communicate and understand each other's standpoints. Before the reorganization, top managers of different departments had meetings together where they could easily communicate and work towards common goals. However, since the organization was adopted to be more global, there is no clear forum for management to discuss together.

4.3 Cash flow forecast deviations

As forecasts are best estimations of future cash flows, there are often deviations. Yet, it is useful to estimate future cash flows to foresee possible shortages of cash. Hence, forecasts are a tool for planning expenditures and income and the more precise forecast, the better preparation for the future. This signifies the importance to monitor the accuracy of forecasts and to understand when and why deviations happen.

4.3.1 Deviations in project cash flow forecasts

Most project cash flow forecast deviations in PMO projects are linked to machine equipment. One reason for this is that machinery and machine parts are typically the major costs of most projects. Hence, these deviations will have greater impact on forecasts. Another reason is that machinery and parts are more difficult to forecast in early stages when the final product is not fully developed, as machine-specifications may not be known. Table 1, presents a summary of reasons for project cash flow deviations found in this study. Some of these listed reasons correlate and are similar. However, they are all mentioned as each signifies individual issues that leads to project cash flow forecast deviations.

It is the project sponsor or the project steering group that make decisions about larger changes in projects. However, most initiative for changes often origins from the project group as they see, for example, that there is high risk, or that market demands are changing. According to an interviewed PMO PM, sponsors understand that their decisions affect project cash flow forecasts, though, they do not seem to reflect on how or how much. However, projects typically do not explain how proposed changes will affect the project cash flow forecasts.

Main reasons for project cash flow deviations
Fast follower strategy
Market pressure
Strategic decisions
Overoptimism
Late payments from HygieneCorp (due to various reasons)
Changes from customers
Changes due to prioritizations amongst projects
Scope changes
Risk mitigations

Table 4.1: Main reasons for project cash flow forecast deviations (as found in this study).

There are some things that PMO PMs cannot affect, such as invoices not arriving at expected time or that there is a dissatisfaction with shipment, causing the project to not book invoices as planned in forecasts. Two interviewed PMO PMs state that the PMO PM can only control about 10% of project cash flows. The remaining 90% is affected by various circumstances of which the PMO PM have no control. Most changes in cash flow forecasts are initiated from a change of situation, of product specifications, or of project scope. However, even though these changes cause deviations in cash flow forecasts, amongst other inconveniences for the project, they are often part of strategic business decisions.

It has been mentioned by PMO PMs that some aspects of payments, cash-outs, can be locked to contractual agreements with suppliers. For instance, when working with complex production machineries together with uncertainties involved in innovation projects, building and installing the machinery is complex and time-consuming. Therefore, it is not unusual to have contractual agreements with suppliers where, for instance, 30% of the total payment is released to the supplier when the order is made, 30% is released once parts or machine has been shipped and 30% after the MTO (machine take-over). This makes estimations for these payments easier to forecast. Yet, there may be changes if the supplier does not live up to their contractual agreements. As the machineries are complex, it can be difficult to install them without complications. For example, if a machine or installation is not working correctly or as agreed, the payment can be paused and not released until contractual agreements are achieved.

Several PMO PMs have mentioned that there is confusion regarding how top management at HygieneCorp want projects to prioritize in terms of time and risk. To generalize, there are two options to choose from, with a grey-zone in between. First, there is the option of being agile and flexible by speeding up the project in order to quickly launch a new product. As a consequence, less time is spent on planning which increase the risk of changes along the course of a project. The second option is to use more time at the outset of projects to allow for more planning. This causes

the launch of products to be later than with the first option, though some risk will presumably be foreseen and mitigated, causing the project cash flow forecast to be more correct.

HygieneCorp are both market leaders and fast-followers on the market which they operate. This is possible due to the wide range of products at the market, where HygieneCorp are market leaders or fast-followers for different products. In segments where HygieneCorp are forerunners, the organization have more time to plan projects and to establish a beneficial environment for working with innovation. Therefore, these market-leading segments provide a better outset for cash flow forecasts.

In segments where HygieneCorp are fast followers, they must follow market leaders and the customer demands these create in order to stay competitive and relevant. In this fast-follower strategy it is vital to be fast and reach the market as soon as possible after the market-leaders. Therefore, the fast follower strategy can be one reason for cash flow forecast deviations. By using this strategy, where there is a need to launch projects quickly to stay relevant and please customers, there is a constant battle with time. As the R&D phase cannot be too extensive, projects must commence without clear frames, meaning the initial project cash flow forecast will be based on little knowledge of project scope.

In a studied pilot project at HygieneCorp, most deviations and changes in the project cash flow forecasts were linked to machines that were built as part of the scope. The forecast deviations were part of strategic choices as changes to the scope were necessary to build machines that would meet requested product quality.

In terms of the pilot project, it was found that the first deviations were caused by changes in prioritizations amongst HygieneCorp's projects. Other projects were prioritized and the pilot project was paused for half a year. Due to this, the cash flow forecast was updated but the initial forecast had high deviations. Other deviations that occured in the pilot project could be connected with different changes linked to machinery. The machine changes included adding several parts that was not considered in the initial project plan or discovered to be necessary once the product was further developed. These forecast deviations were strategically necessary in order to obtain requested product quality form the customer.

Another deviation that happened during the project was that another product segment was added to the project when it had been running for some time (due to market changes). Such large changes required a change request to be issued. Most deviations in the pilot project were necessary to mitigate risks and deliver the project successfully. The deviations that were found in the pilot project are illustrated in Table 2.

Main reasons for project cash flow deviations	Pilot project
Fast follower strategy	
Market pressure	X
Strategic decisions	X
Overoptimism	
Late payments from HygieneCorp (due to various reasons)	
Changes from customers	
Changes due to prioritizations amongst projects	X
Scope changes	X
Risk mitigations	X

Table 4.2: Main reasons for project cash flow forecast deviations for the pilot project.

4.3.2 Managing the triple constraint

As HygieneCorp are producing and selling various types of hygiene- and health products, different aspects of the triple constraint are prioritized depending on which market that is considered. Regarding the markets where HygieneCorp are market leaders, cost and scope are typically more prioritized than time. However, when HygieneCorp are adopting the strategy of being a fast follower, there are more aspects to consider. Therefore, the following reasoning will concern projects where HygieneCorp are fast-followers.

HygieneCorp are producing and selling products in two ways; they sell their products under their own brands, but also as private label. When faced with issues where compromises are required, the customer satisfaction is prioritized, both for private label business and for HygieneCorp's own products.

When working with private label, time and scope aspects are decided and set by the customers through negotiations with the marketing department. This means that these aspects of the triple constraint are usually not flexible. Hence, why the third aspect of cost is often compromised on in this case. This is often the practice when working with private label business at HygieneCorp, even though there is no outspoken way of prioritizing in the organization. The customers usually have a clear launching date and scope for the product and since the company use a fast follower strategy, there is often limited time to develop and produce the product. As a result, the company must manage several consequences and risks in order to manage in time. For instance, there is typically no time to wait until the product development phase is finished before setting the first project scope and the capex. Therefore, project scope and capex are often decided in an early stage with rather little knowledge on what is required in the project.

If a private label business customer requests a specific product or specific traits in a product, and they require it to be available at a certain time, it can become highly

expensive for the company. However, when deciding on doing the requested project or not, HygieneCorp weighs short-term costs of the project against long-term costs of losing that client.

If considering all projects, both as market leader and as fast follower, the interviewed PMO PMs have all mentioned the triple constraint without being asked about it specifically. One PMO PM mentioned almost always considering the triple constraint aspect of time to be most important. Time has been prioritized as it is important for HygieneCorp to quickly follow innovations and demands on markets. The PMO PM argues that HygieneCorp is often behind and start projects too late (not that they are too slow when executing).

One interviewed PMO PM argues that it is naive to try to meet all the aspects of the triple constraint. It is better to try to communicate about different scenarios and risks in the project to create a strategy and a plan for how to act and prioritize. The same person mention that there should be better transparency in the organization. It should be easier to access cash flow information and it should be easier to make sense of that information. This could lead to more educated decisions in terms of prioritizing as there would be further understanding. Improved systems support (IT-based tools) could also help simulate changes to create better understanding.

4.4 Managing deviations

Today, HygieneCorp and the PMO PMs have no standard model for how to forecast project cash flows. Nor have they established any clear routines for how to document and manage deviations. Instead, deviations are dealt with once they are discovered, which often requires approval from project sponsors or project steering group. Therefore, it can be argued that the routine is to inform sponsors and other stakeholders about the anticipated deviation and to wait for their recommendation.

There are different ways of managing deviations. Some deviations are avoidable, and some are unavoidable and must be managed. For instance, deviations occurring due to late arrival of supplier invoices are difficult to avoid. Whereas a deviation caused by prioritization of projects are deviations initiated by management and are thus optional and could have been avoided.

Furthermore, forecasts are also subject to changes driven by the industry and changes caused by the organization's strategic decisions. Therefore, no matter how thoroughly the forecasting processes have been, the forecasts must still manage changes and make adjustments. These types of changes are often unpredictable from a project perspective and rather firm as they are related to strategic organizational decisions.

If the deviations affect or change the project scope, a change request must be submitted. Should the approved capex be exceed by more than 5%, a new capex request is required. If a new capex request is done, a new and updated cash flow forecast

will be included as a standard requirement. However, the effects on the cash flow forecast is not accounted for in the change request.

5

Discussion

In this section, the discovered results will be linked to the literature and discussed in relation to the three research questions. The research questions will set the order for the discussion, starting with research question one.

5.1 How cash flow forecasts are made at HygieneCorp

At HygieneCorp, there is no forecasting method or standard routine when estimating capex and project cash flow forecast. In academia, there are many available methods for cash flow forecasting in projects, and no unison as to which that are the most beneficial to use. Perhaps the reason is that organizations and projects are so unique that no model can be optimal. It may be argued that this indicates that no researcher can make a model and propose that it should be commonly used in organizations.

It is argued by Liu and Wang (2008) and Gumbley and Blahnik (2015) that cash flow should be considered in relation to the project schedule when making a project cash flow forecast, as the two aspects are intertwined. From the result in this report, it can be seen that HygieneCorp does this in their projects when making a cash flow forecast. However, as the project scope is not always set when the cash flow forecast is done, and as the schedule often changes during the project, there is no guarantee that doing the cash flow forecast according to project schedule will make the initial forecast accurate.

Furthermore, Reider and Heyler (2002) also argue for the importance of all projects using same formats to allow cash flow forecasts and actual spendings to be easily compared. Moreover, having common documentation and reporting systems could impact the knowledge sharing in the organization, and it could enhance understanding of processes. By using same format for documenting all projects, data and other information from projects can be measurable and comparable. Other benefits include that the understanding of projects and reporting systems could be improved, and it could be easier for PMO PMs to take over projects from colleagues. Further, it can ease the process for the manufacturing controllers if there are similar documents and routines for all project cash flow forecasts.

The cash flow forecast is included in the capex request, which all projects must submit. However, if there are changes in a project, deviations in cash flow forecasts are not considered in the change request. As project changes often affects cash flow forecasts, HygieneCorp can miss opportunities to spread knowledge and understanding of consequences of decisions. Currently, the cash flow forecast aspects do not have to be included in the change request. Therefore, there is a risk that sponsors and project steering group will not understand how changes will affect the project

cash flow. To increase the understanding and achieve common institutional logics it is important to communicate changes and deviations and how they affect the cash flow forecasts.

As well as there is no standard routine for making the initial project cash flow forecast at HygieneCorp, there is also no outspoken routine or method for managing the cash flow of a project. Adjei et al. (2018) argue that there is no "best practice" for cash flow management of a project, mentioning that each project calls for different approaches and tools. It may be argued that this is a logical reasoning as the differentiating nature of projects makes it difficult for an organization to provide general guidelines for cash flow forecast monitoring as a way of ensuring that certain steps are followed/completed to achieve quality. Perhaps HygieneCorp is right in letting each PMO PM use their own techniques for projects, presuming that tools and approaches they use are effective, as that signify flexibility.

It could be argued that there are many contradictions at HygieneCorp and in the projects in terms of project cash flow forecasts. For example, it was mentioned during interviews that the more effort put into the project cash flow forecasts from the beginning, the better forecast quality as a result. However, as many projects must be hurried into and since there are several tasks that must be completed (perhaps causing cash flow forecasts to be deprioritized), it can be difficult to put much effort into preparing the cash flow forecasts. Moreover, perhaps it is not fair to expect all projects to keep a certain level of cash flow forecast accuracy. As each project is unique with different levels of risk and different amount of time to identify and mitigate them, it might be naïve to believe that the same cash flow forecast accuracy can be achieved for all PMO projects.

At the outset of this study, HygieneCorp mentioned that they worry about the consequences of their project cash flow forecast deviations. They argued that faulty forecasts would lead to HygieneCorp lending too much or too little which could cause additional expenses. The fact that treasury are lending on a daily- or weekly basis to pay for invoices, can be said to argue against these worries. As they are lending on such short notice, faulty project cash flow forecasts will not cause any considerable costs for HygieneCorp. Moreover, it can be argued that in terms of payments and cash flow forecasts, the problem is non-existing since treasury only consider received invoices. These findings can be said to be an example of lacking communication and knowledge sharing - when parts of the organization are worrying about and taking action against something that is not an issue (at least not in terms of lending monetary assets).

Furthermore, as the impact of faulty project cash flow forecasts is not as significant as some have argued for at HygieneCorp, it can be questioned how much effort that is motivated to spend on cash flow forecasts and the accuracy of each forecast. However, the gain of forecasts is that behaviours and project plans can be modified so HygieneCorp can be better prepared for the future (Brunel University, n.y.). Therefore, the forecasts' purpose is more of a preparational character than it is a tool for reserving monetary assets.

Smith et al. (1996) argued that the longer time horizon, the less accuracy of forecasts; which implies that the closer a forecast is to expenditure, the better accuracy. Yet, it is helpful to make an initial forecast as it can identify potential risks and weaknesses (Fight, 2005) and thus help monitor these stages (Reza and Bagherpour, 2013). Additionally, initial forecasts are important for estimating and reserving required resources for projects (Billows, 2016). Therefore, it can be claimed to be important to prepare initial forecasts even though the quarterly forecast updates are more accurate as they are increasingly closer to the payments.

5.2 The types of deviations and why they occur

In the result, several main reasons for cash flow forecast deviations in PMO projects were found. These are, again:

- HygieneCorp adopting a fast follower strategy
- market pressure
- strategic decisions
- overoptimism (when making the cash flow forecast)
- late payments from HygieneCorp (due to various reasons)
- changes from customers
- changes due to prioritizations amongst projects
- scope changes in the project
- risk mitigations.

This section will discuss these listed reasons and other aspects connected to project cash flow forecast deviations.

Smith et al. (1996) mention that forecasts are almost always wrong, and that it rather is a question of how wrong. However, Billows (2016) and Adjei et al. (2018) argue that it is important that the cash flow forecast is correct and accurate. These two latter references make it seem as if though there would be a possibility for all organizations to improve their cash flow forecasting enough for all forecasts to be correct. The results of this study is in line with Smith's theory. This is as the nature of the PMO projects with their high risk, high complexity, and many unforeseen changes, makes it seem unrealistic that cash flow forecasts can be completely accurate. If wanting the project cash flow forecasts to be accurate, HygieneCorp would need to always prioritize following all cash flow forecasts, which would most definitely lead to poor performance and poor outcome of projects. In that case, following the cash flow forecasts completely would lead to business disadvantages.

Thus, it can be argued that there must be a balance where deviations are allowed.

From the study it appears that forecasts can only deviate in either volume (amount of money) or in time. From studying HygieneCorp, it seems that even though there are two possible deviations, the most common deviation at HygieneCorp is moving the predicted cash-out in time. There can be several underlying reasons for this but as seen in the studied pilot project, most deviations are related to the company's decision to be flexible. As HygieneCorp strive to be flexible, they develop their products over the course of the projects (as suggested by the innovation funnel). This means that little will be known about projects when the cash flow forecasts are made. Accordingly, it is not unusual that these projects have several cash flow forecast deviations.

Another common reason for project cash flow forecast deviations is the project managers' behaviour such as unintentional optimism (Müller 2011). Inaccurate information when preparing forecasts (Pitkänen 2016) or changes that affect projects (Billows 2016). This research found that HygieneCorp's deviations are often related to changes since the organization is subject to several project changes among their product development. There is also a possibility to underestimate costs in order to receive an approved project plan.

Smith et al. (1996) found that technical changes and market changes caused by competitors present risk and thus affect the project cash flow forecasts. For HygieneCorp, that operates in a constantly changing and innovative market, this means that the outset for having good forecast accuracy is low from the beginning. Another impact of the industry is that competitors can easily change patterns on the market which affect the possibilities of good forecast accuracy (Smith et al., 1996).

It can be argued that HygieneCorp are sensitive to customer satisfaction, as losing a customer can have a large business impact (Smith et al., 1996). However, this business impact can be difficult to measure in for example monetary terms. The fear of losing a client reflects in the project cash flow forecasts as HygieneCorp must adapt to the clients. If a client pushes for an early launching date of a project, that project must start early, which means more risk of changes in the cash flow forecast. Also, should a client want scope changes mid-way through a project, it will cause cash flow forecast deviations. When a client press boundaries and the project might not be profitable for HygieneCorp, the organization will have to consider the cost of doing the project and meeting the customers demands, versus the long-term impact of losing that specific client.

The hygiene industry is complex and involves high risk with new developments and patents. These risks can, in turn, affect the project cash flow forecasts. Innovation projects are difficult to forecast due to the numerous uncertainties involved (Kahn et al., 2013). Hence, these projects are associated with poor cash flow forecast accuracy. Furthermore, the complexity of working in an ever-changing surrounding affect the forecasts and cash-out plans. One reason for this may be that companies have to adjust their priorities to the customers and thus the priority amongst projects

can change. For example, if product demands increase, the focus must be put on producing more products. Moreover, if there is a market change and a new product attribute is requested, the company's focus will have to shift. Consequently, one or several projects might be paused, causing changes in the cash flow forecasts. However, these types of decisions are made by upper-management and not by the PMO PMs.

At HygieneCorp, there has been much focus on the PMO and the PMO PMs having to produce better cash flow forecasts. However, as there are several actors and activities that affect the lack of accuracy in project cash flow forecasts, deviations are often affected by decisions that the PMO PMs cannot control. It was mentioned that the PMO PMs can only control about 10% of project cash flows. However, it can be argued that even if the PMO PM cannot control if forecast deviations happen, they can control how they are dealt with. Even if deviations affect the cash flow forecasts, the PMO PM can make sure that why they happened is communicated. Further, as some suggestions for changes originate from the projects, the PMO PMs might have more control than 10%, only they make decisions that are the most strategic for the business and interpret it as if though there is no choice.

It appears that which aspect of the triple constraint that is most important to focus on varies depending on the project, seeing as each project is unique. Even though it can be argued to be important to follow the project cash flow forecasts, it may sometimes be more important to prioritize other things if it is more beneficial for HygieneCorp. Further, as it is often the customer (through negotiations) who set time and scope demands, the cost aspect is often least prioritized, though it is still considered. Moreover, it can be argued to be important to communicate the choice of which aspects of the triple constraint to prioritize and the consequences that it has. It may also be beneficial to have a meeting with sponsors and the project team where there are open discussions regarding the nature of the project, how to prioritize between time, cost and scope, and the consequences of the prioritization.

It was mentioned by several PMO PMs that they experience a lack of transparency between themselves and the factories. Since it is the FPM who register and manage all invoices, the factories have better overview of cash flows when they report cash flow status to the manufacturing controller. Therefore, it can be argued that the PMO PM loses some control over cash flow forecast status. The PMO PM can request a statement of all invoices but since there are such large amounts of different parts included in the machinery, invoices can be rather difficult to interpret. Consequently, even if there is a transparency between the factories and the PMO PM it is still difficult for others than the FPM to understand what has been delivered and installed.

Last, this section has described in detail how deviations occur at HygieneCorp by focusing on how forecasts are made, and what kind of deviations that occur. Next, the third research question deals with how deviations can be better managed. One question that must be raised is to what extent it is really a problem that deviations occur, and to what extent they actually need to be solved. It seems that the view

on to what extent a deviation is a problem or not is a matter of perspective. When these perspectives clash, irritation and suboptimization may be a result. These aspects are further elaborated in the discussion.

5.3 How project cash flow deviations can be better managed

It would be beneficial to increase the knowledge about deviations and understand underlying reasons for why deviations take place. This study did not provide a model for predicting deviations. However, understanding the effects on the cash flow forecasts caused by deviations can improve the forecasts and, more importantly, establish a common understanding. As it is difficult, or even impossible, to avoid all deviations in cash flow forecasts, it can be argued that more focus should be placed on how to neutralize the effects of them rather than how to avoid them.

Following discussion concerns how project cash flow forecast deviations can be better managed. This is done by focusing on aspects such as innovation complexities, institutional logics, communication, documentation, transparency and knowledge sharing.

Due to the complexity of working with new product development and innovation, combined with a complex business environment, all project cash flow forecasts are biased with deviations from the beginning. Accordingly, it is important to monitor uncertainties and, as suggested by Kahn et al. (2013), develop a process that is built on cross-functional communication, previous knowledge from innovation projects, and feedback from customers. As innovation projects are built on assumptions of the future, most forecasts can be improved by monitoring the assumptions in a tracking-system that can control if the forecasts will deviate or not. It is also mentioned that successful forecasting organizations have databases with gathered data and knowledge from prior projects than can be tracked and used for validating innovation projects (Kahn et al., 2013). If HygieneCorp establish such a database, they can compare and analyse the forecast accuracy of previous similar projects.

At the outset of the study, it seemed that all, or most, proposed changes were initiated and communicated by sponsors, who in turn had received input from the marketing department or top management. However, it was later realized that most initiatives for changes in projects derived from the project itself. This should give projects more time to adapt and plan for changes before they are decided on by the sponsor, making these changes more foreseeable compared to changes initiated by sponsors or other managers. However, as most changes are market-driven, they may still be difficult to predict and prepare for. One reason for misunderstandings in the organization may be that different departments have different goals which they are working towards. Theses goals need to be communicated and understood to the extent that these goals match, and all work towards common goals in same direction.

It is common that multiple logics coexists in an organization (Greenwood et al., 2011; Besharov & Smith, 2014) but it is important to consider the amount of logics existing and the incompatibility of these logics (Greenwood et al. 2011). For HygieneCorp, it is useful to consider their logics related to project cash flow forecasts as these can cause conflicting goals (Greve & Zhang 2017) and organizational tension (Greenwood et al. 2011). These logics should be acknowledged and considered to allow for new, common logics to be developed.

At HygieneCorp there are at least two different logics and perspectives on cash flow forecasting that are conflicting. First, there is the financial logic of trustworthy and reliable cash management. Secondly, it is the project management logic of flexibility and adaptability to deliver successful projects. Both of these logics are important aspects of cash flow forecasting. However, they are presently conflicting rather than balanced, which can cause tensions.

One worry of HygieneCorp, especially from the financial perspective, is that project cash flow forecast deviations could be found in the quarterly reports. If deviations could be visible in quarterly reports, it could lead to distrust from current and potential shareholders. This is one of the main reasons for the multiple logics at HygieneCorp, where the PMO often perceive deviations as necessary to achieve best business benefits from projects, and where the financial side only see issues caused by these deviations. Besides improving internal communication to increase understanding, external communication to shareholders and investors is also essential. Understandingly, HygieneCorp cannot share all internal information in their quarterly reports or on their investor relations webpage.

It may be argued that in terms of project cash flow forecasting, multiple logics are an issue at HygieneCorp as they cause conflict. However, what cause issues is not the differing logics, but the lack of understanding, good communication and transparency between the logics. Therefore, it is important to understand and communicate existing logics related to forecasts in order to establish a mutual logic for cash flow forecasts.

It can be implied that the accuracy is not the main issue at HygieneCorp in terms of project cash flow forecasts. This is as most deviations happen due to HygieneCorp's strategy of doing business, which signifies flexibility. Yet, allowing flexibility is the most beneficial way of working for HygieneCorp. Additionally, as mentioned by the financial side of the organization, monetary effects of faulty project cash flow forecasts are not large enough to be a major issue. Instead, one issue from faulty cash flow forecasts is that it creates tensions within the organization and that it produces distrust from stock market and shareholders. It may be argued that both these issues can be resolved fairly well by communication; both internal and external. Hence, this thesis argues that the main issue is not the faulty cash flow forecasts as such, but the poor, or in some cases lack off, communication.

As mentioned by Bardia (2010), communication can help blend organizational functions. Since HygieneCorp have multiple logics, communication could be a solution

as it is necessary for all to understand each other and work together. Moreover, Constantin and Baias (2015) mention that communication can help employees work towards a common goal. It can be argued that the different logics at HygieneCorp mean that employees are sometimes working towards same goals, but at the same time trying to meet goals of their individual departments. If improving the communication within the organization, and especially between managers, routines at each involved department can align to allow all to work solely towards same goals, but while having different views and expertise. As mentioned by Cowan (2014) it is also important that communication is done not only between managers to managers and employees to employees. Hence, the communication at HygieneCorp should be cross-functional and between all departments.

As most changes that are made in a project are part of strategic business decisions, they are often necessary. However, there is currently a tendency of "blaming" projects and saying that the PMO PMs are not good enough at monitor and follow estimated cash flow forecasts. This may be seen as a sign that there is a need to communicate and educate the different departments within the organization. It must be understood that most projects must work in a fast changing and innovative environment, which causes changes and deviations to happen.

Constantin and Baias (2015) mention that internal communication improves the knowledge of work policies and employees ability to work toward common goals. However, in larger organizations such as HygieneCorp it can be difficult to know which employees to involve in the internal communication. As suggested by Downs and Adrian (2012), making audits can be a way of understanding and improving communication within an organization.

Moreover, external communication towards shareholders, investors and other outside parties can be further improved as well. Butera (1996) emphasises the importance of effectively communicating with investors and how quarterly reports are useful tools. Accordingly, it can be beneficial for HygieneCorp to use their quarterly reports to communicate regarding project cash flow forecasts and the causes for deviations.

Documentation is considered an important aspect of communication within an organization. It is arguable that there is a lack of understanding between departments at HygieneCorp in terms of project cash flow forecasts. This especially concerns how reasons for cash flow forecast deviations in projects are not communicated. By documenting when and why deviations happen and the consequences of them, others in the organization can more easily understand the reasons behind deviations.

According to Bresnen, Goussevskaia and Swan (2004), projects tend to work with a short term perspective, whereas the organization tends to work with a long-term perspective. It may be argued that this affects HygieneCorp as documentation (amount and format) is not prioritized in projects due to the short-term perspective. However, at a company level, it would be good to have better documentation practices in the organization as it could be beneficial short-term (understanding), and long-term (for example mapping of projects or making knowledge accessible).

Documentation and communication can improve the transparency of an organization. At HygieneCorp, there is room for improvement in terms of transparency between departments. For example Khan et al. (2013) and Olsson, Johannesson and Schweizer (2018) mention increased transparency as a way of improving cash flow forecasts. Moreover, to avoid underestimating costs, Olsson, Johannesson and Schweizer (2018) suggest increasing the transparency of different analyses as well as changes in project cost or scope. Accordingly, there may be a possibility for HygieneCorp to improve the transparency between different departments; such as between the PMO PM, FPM, manufacturing controlling and project owners (sponsors).

Moreover, lack of transparency is associated with a lack of knowledge sharing. At HygieneCorp, most PMO PMs base their decisions on "gut feelings" and own experiences rather than on collective knowledge. Therefore, there seem to be no exception from Hislop's (2013) findings that most organizational knowledge is tacit knowledge. Therefore, the PMO PM intranet should be improved and well-functioning to allow tacit knowledge carried by PMO PMs to be converted into explicit knowledge. As a result, the knowledge becomes accessible so the PMO PMs can retrieve knowledge from others and provide their feedback and knowledge. This could improve some estimations in the project cash flow forecasts, but also help more junior project managers with guidance.

Pitkänen (2016) mention that an important part of improving the cash flow forecasts is to learn from the past to establish a learning process. As HygieneCorp uses different formats and document designs for each project when it comes to cash flow follow up, and as they are not stored centrally, it is currently difficult to learn from past projects and to improve processes. Olsson, Johannesson and Schweizer (2018) promote analyzing changes in the project. It can be argued that this would provide great knowledge which could be gathered and learnt from to avoid similar mistakes in the future. Even though all projects are different, they may include some similarities which can be useful to analyze.

As seen in the discussion, cash flow forecast deviations in combination with flexible innovation projects are a complex subject with several aspects that require consideration. As this thesis found, there are several different and connected factors linked to project cash flow forecast and deviations. These factors are concluded in the next section.

6

Conclusion

This study has investigated how project cash flow forecast routines and deviations in innovation projects can be improved in a company within the hygiene consumer business (HygieneCorp). This single case study found that project cash flow forecast deviations as such are not the main issue at HygieneCorp. Instead, the more important issue is how forecasts and deviations are communicated between departments and how reasons for deviations can be better understood.

It was found that the constantly changing hygiene industry, combined with product areas where the organization is a fast-follower, affects the amount of project cash flow forecast deviations and to what extent these can be managed or avoided. There are several unavoidable deviations affecting cash flow forecasts, meaning for these, the accuracy of forecasts are affected no matter the quality of initial forecasts. In these projects, the forecasts should be of less priority and the focus can instead be shifted to monitor the deviations.

This thesis argues that most deviations at HygieneCorp are unavoidable as flexibility and customer satisfaction is highly prioritized. However, there are different understandings and logics within the organization regarding topics related to project cash flow forecasting and deviations.

The thesis also suggests that the different logics should be better communicated to allow a common logic of project deviations to be established. Further, potential deviations should be better reported and documented to increase transparency within the organization and to increase the level of knowledge by storing data.

Some proposals for improvements were found. First, the forecasting routine can be improved by implementing common documentation and reporting systems. Second, it is advised that the change request is modified to require the effects of changes on the project cash flow forecasts to be accounted for.

6.1 Contribution to the field

This study has contributed to the field of project cash flow forecasts by investigating cash flow deviations in innovation projects. This is a fairly unexplored area, making this study one of a few.

Moreover, this study yields interesting insights in the understanding of how deviations in forecasts can be discovered and communicated through the company to establish a common ground and understanding. Another insight found in this study was how several institutional logics of cash flow forecasts create tensions if the logics

are conflicting. Further, the thesis also demonstrates the complexity of working with innovation projects with limited time and constant scope changes.

As this report is a single case study, it provides a detailed view of the cash flow forecasting process in innovation projects and how their cash flow forecast deviations are managed. This provides opportunities for other researchers to do a similar case study to compare organizations and find patterns which can bring more understanding and knowledge to the field.

This thesis contributes to the field by highlighting the complexity of forecasting cash flows in innovation projects. Therefore, it was found that less emphasis should be put on the forecasting methodology and instead focus on improving the understanding of deviations. It is also suggested that an interplay between the different existing logics in the organizations can contribute to further knowledge of deviations and common project and organizational goals.

6.2 Future research

Further research on the forecasting process for innovation projects is required, since most forecasting research is either made at a company level or made for projects with few uncertainties. The forecast deviations presented in this research emphasize the implications related to innovation projects and present the wide range of research space for this area.

Had this study been done again, some things may have been done differently. If there had been time to do a more extensive research or if there will be future research, there are several things that could have been interesting and beneficial to explore.

Since there are several departments involved or linked to the forecasting process, it would be interesting to study other departments and their perspectives and relation to the project cash flow forecasts. For example, it would be interesting to learn more about how the project forecasts are managed from the manufacturing controller and onwards.

This single case study represents only the areas of the organization which are most concerned with project cash flow forecasts and from a PMO perspective. Exploring other departments further could lead to additional insights and understanding of the different project forecast involvements.

This study highlight several deviations that could occur when working with innovation projects that was discovered from interviews and from one studied pilot project. Studying several projects and produce quantitative data from prior projects at HygieneCorp would be interesting. This can, for instance, be done by compiling quantitative data from several projects and analysing how and why different decisions were made and how the decisions affected the forecasts. This could allow future research to find more patterns and to make more general conclusions. Analysing quantitative

data could give other interesting findings to research question two. However, this was not possible in this study as previous data from projects and forecasts were not available.

An interesting study may be to investigate and compare different organizations working with innovation projects to see how they are alike or differ in terms of working with cash flow forecasts. This could allow more general recommendations that can be of use for more organizations or industries. However, if doing this, the study should be limited to innovation projects, as working with those creates certain complexities which affects the forecast accuracy.

6.3 Recommendations to the organization

Through the discussion, several recommendations for how to improve the outset and processes for the project cash flow forecasting and management at HygieneCorp could be extracted.

Most cash flow forecasting models can be argued to be too general for most organizations. This suggests that HygieneCorp will not benefit from using a forecasting model as it withholds the flexibility for projects and for the PMO PMs. Nonetheless, HygieneCorp can make and implement their own framework with general guidelines and checklists for how to prepare a project cash flow forecast. This can help underline the importance of thoroughly working with forecast estimations. It can also help avoid possible mistakes and the PMO PMs can use the guidelines and checklists to control if they have missed anything. Moreover, it is important to allow the PMO PMs flexibility by using the guidelines as advice rather than as a standardized process. By letting the PMO PMs participate in making the guidelines and checklists, they can be relevant and more likely to be used.

A common reporting system could establish a platform for the cash flow forecasts which can enable mutual understandings. It would be useful if all documents concerning project cash flow forecasts used standardized document structures. This would improve the understanding between projects by making them comparable, but also decrease the workload for the manufacturing controller and project managers working with several projects.

Further, cash flow forecasts could be done in the same software as the project schedule. By having the cash flow forecast follow-up and the project schedule in the same software, the PMO PMs can easier monitor cash flows and gain overview of projects. The PMO PMs at HygieneCorp could then have access to the FPMs cash flow follow-ups.

At HygieneCorp, there are currently issues with transparency, different logics and a lack of understanding of others situation. This thesis suggests communication as a solution to this. There are many ways in which communication can be improved. This can for example be done by realizing that there are issues, addressing the

issues and communicating reasons for improving the forecasts so employees want to improve the process.

This thesis did not have enough time to study all relevant communication patterns within the organization or how communication and knowledge sharing can be improved. However, a useful instrument for HygieneCorp as a first step would be to perform audits of how the communication is done in the organization. As a result, there can be a better understanding of the communication in the organization, employees become aware of the importance of well-functioning communication, and HygieneCorp will start gather data about their internal communication to allow future benchmarking.

A concern at HygieneCorp is that faulty cash flow forecasts will reflect in quarterly reports and make the company lose current and potential shareholders. This thesis presents communication as a solution for this as well. For instance, they can communicate to the public about how they work in terms of having innovation projects with much uncertainty as a way of being quick on the market to gain business advantages. If sharing this information, there is a better chance that current and potential investors understand the background of the cash flow deviations in the quarterly report. By explaining that the deviations must happen to achieve the best possible outcome for the company, investors will more likely oversee issues or even see them as something positive.

Managing the triple constraint entails challenges for all projects. At HygieneCorp there are no guidelines for how to prioritize between the three aspects of scope, time and cost. According to this study, this is useful as each project is unique and have different purposes and aims. However, for each project, it may be beneficial to communicate to all involved departments how the triple constraint aspects should be prioritized and why. Moreover, as HygieneCorp operates in a constantly changing market, and as they want to work in a flexible way, it is important that there is room for changes in how to prioritize between scope, time and budget. If the project change the prioritization of the triple constraint aspects, it will be important to communicate the new prioritization.

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