

Cognitive absorption in work-related information system usage - Case: Cash flow estimation in private equity financed companies

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ABSTRACT

Objectives – It is ever important for the businesses to forecast cash flows to be able to adapt to the changing economic environment and optimize the use of company assets. Forecasting is especially important for companies that are in the early stage of their life cycle. Despite the importance, rarely do these companies implement forecasting in a structured or automated way. The purpose of this study was to explore how the cash flow estimation was completed in private equity financed companies. The objective of this study was to find out if cognitive absorption, i.e. deep involvement, in information system can occur, when cash forecasting is implemented.

Methodology – This study was based on cognitive absorption theory. There were six case company interviews and one interview with the venture capital investor. The interviews were analyzed by utilizing coding technique and qualitative comparative analysis method. The sample size of this research was small, which limited the study. In addition, because of the coding technique is characterized by abstraction and endlessness, analyzing the data was challenging and interpretative.

Findings and conclusions – The findings showed that the respondents generally recognized cognitive absorption dimensions, e.g. flow, as a part of the cash forecast execution process. Also emotions emerged. Conclusion is, that also irrational factors can affect in the usage of work-related, rational information systems. Irrational factors can have significance in user's intention to start and to continue system usage. As a conclusion, system developers should acknowledge these factors when the system is being developed to be able to appeal the users in multiple levels.

Key words – cash flow estimation, forecasting, e-accounting, private equity, cognitive absorption, flow, irrational, rational, non-instrumental, instrumental, hedonic, utilitarian

TIIVISTELMÄ

Tavoitteet – Kassavirtaennustaminen on yhä tärkeämpää yrityksille, joiden täytyy kyetä sopeutumaan muuttuvassa taloudellisessa ympäristössä ja optimoimaan yrityksen varojen käyttö. Erityisen tärkeää ennustaminen on aikaisen vaiheen yrityksille. Tärkeystä huolimatta, nämä yritykset tekevät harvoin ennusteita strukturoidusti tai automatisoidusti. Tämän tutkimuksen tarkoitus oli tutkia kuinka kassavirtaennustaminen toteutettiin pääomarahoitetuissa yrityksissä. Tutkimuksen tavoite oli löytää, voiko kassavirtaennustamisen yhteydessä esiintyä kognitiivista absorptiota, eli syvää keskittymistä tietojärjestelmään.

Metodologia – Tämä tutkimus perustui teoriaan kognitiivisesta absorptiosta. Tutkimus koostui kuudesta case-yrityshaastattelusta ja yhdestä pääomarahoitussyrityshaastattelusta. Haastattelut analysoitiin hyödyntämällä koodaustekniikkaa ja qualitative comparative analysis-metodia. Tätä tutkimusta rajoitti suppea haastatteluiden määrä. Lisäksi koodaustekniikan abstrakti ja jatkuva luonne tekivät datan analysoimisesta haastavaa ja tulkinnallista.

Tulokset ja johtopäätökset – Tulokset osoittivat, että vastaajat yleisesti tunnistivat kognitiivisen absorption ulottuvuudet, esimerkiksi flown osana kassavirtaennustamisprosessia. Myös tunteita tuli esille. Johtopäätöksenä voidaan sanoa, että myös irrationaaliset tekijät voivat vaikuttaa työperusteisten, rationaalisten tietojärjestelmien käyttöön. Irrationaalisilla tekijöillä voi olla merkitys käyttäjän aikomukseen aloittaa ja jatkaa järjestelmän käyttöä. Yhteenvetona, järjestelmän kehittäjien tulisi tiedostaa myös nämä tekijät järjestelmää kehittäessä voidakseen miellyttää käyttäjiä useammalla eri tasolla.

Avainsanat – kassavirtaennustaminen, ennustaminen, e-laskenta, pääomarahoitus, kognitiivinen absorptio, flow, irrationaalinen, rationaalinen, ei-välineellinen, välineellinen, hedonistinen, utilitarinen

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1 Introduction

Cash flow estimation is a part of a company's financial management. Cash flows can be defined as "the inflows and outflows of cash and cash equivalents created of the operating, financial, investment and extraordinary activities of the company" (Mackevičius and Senkus, 2006, p. 171). Cash flow forecasting gives valuable information about a company's future financial state and therefore, it is a strong support for a company's short-term and long-term managerial decision making.

Today's information technology provides accounting information system (AIS) tools that help a company to conduct such activities as cash flow estimation in more automated manner. However, these tools do not always respond to the user needs and the users need to settle for other systems. Knowing user needs is critical for service providers, who need to know what makes their system superior and desirable. For this purpose, it is important to study the user needs and motivations in more holistic manner.

Most studies about the user's motivation factors are from utilitarian and instrumental point of view. Utilitarian and instrumental refers to benefit-based motivation factors, such as salary or promotion. However, the hedonic and non-instrumental motivation factors have also been founded to have a strong influence on the user's intention to use information system. Hedonic and non-instrumental refers to the states which are driven by psychological factors, like emotions and unconscious perceptions (e.g. Agarwal and Karahanna, 2000; Magni et al., 2010). The relevance of hedonic reasons in information system usage needs to be examined closer.

1.1 Background

The most important function of cash flow estimation is to assure solvency and liquidity of a company. Liquidity can be defined as a short-term measure for a firm's ability to pay its obligations on time, and solvency as a long-term measure for company's ability to cover debt obligations. If a company is affected by negative short-term cash flows, it can become illiquid. Equally if company's expected rate of cash flows decreases sufficiently, it can become insolvent. (Gryglewicz, 2011)

To a large extent companies acknowledge the importance to produce cash flow estimations, although this specific accounting task is voluntary. Basware (2010) conducted a survey about the current state and importance of cash flow estimation among 157 respondents. The survey stated that 61 % of chief financial officers (CFOs) and accounting professionals agreed that the importance of financial forecasting as a determinant to successful business has grown during the past year. Likewise, KPMG's (2009) survey about cash and working capital management stated that 28 % of the CFOs considered cash management as the number one priority in their work.

Although cash flow estimation has been acknowledged important, only minority of the companies use cash flow estimation information system for conducting the forecasts. The reason for this is the lack of proper software on the market. According to Basware's survey, 63 % of the respondents still used spreadsheet solution that was Excel, to conduct the estimation. At the same time 32 % of the respondents told that they were not satisfied with the current forecasting tool (Basware, 2010). KPMG's cash management survey also stated that the forecasts failed among 72 % of the respondents. In other words, the current methods of conducting forecasts were not accurate enough. As a conclusion, a need for improved systems exists and many organizations have stated that in the future they would be investing in software that produces cash flow estimations (Basware, 2010).

Bagranoff et al. (2010) also write that accounting information systems are continuously gaining more importance in the accounting field. According to Bagranoff et al., accountants all over the world have realized the importance of understanding the software usage, as accounting companies are gradually shifting their services towards more computerized base. Technology allows accountants to offer more value adding services to their customers. At the same time AIS end-users, i.e. companies understand the benefits that the new automated way of conducting the mandatory and voluntary accounting operations brings. The new technology makes the accounting processes more efficient, accurate and timely. They enable companies to conduct automatically such accounting computations that before required manual work.

Adapting new technology, such as new AIS tools, creates new challenges for companies. Research shows that there are differences in the ways that individuals adopt technology (e.g. Agarwal and Karahanna, 2000; Devaraj et al., 2008; Venkatesh 2000). Some individuals are more motivated to learn new technology and therefore more open to change their ways to work. Differences in the attitude of an individual to continue the software usage occur as well. This creates challenges not only for the companies that bring new IT to their operations, but also for the information system providers. Basware's research supports this argument. Basware's research stated that one of the three biggest barriers for reliable cash flow forecast information is the lack of know-how and commitment of forecasting personnel (Basware, 2010).

The user attitudes towards system usage can be explored from several different theoretical perspectives that information systems science provide. The majority of research conducted in this field concentrates on the instrumental and utilitarian benefit that an individual gets from the usage of information technology. However, recent research has observed that also non-instrumental and hedonic factors have an effect on the IT usage. One of the most known theories in this field is Agarwal and Karahanna's theory about cognitive absorption (2000). This theory has later on been adopted in many other studies which makes the theory significant in information systems science field (e.g. Baudry and Pinsonneault, 2010; Gu et al., 2010; Magni et al., 2010).

Cognitive absorption refers to the way that individuals adopt technology. Agarwal and Karahanna approach this adoption from non-instrumental aspect. Non-instrumentality refers to psychology and variables, such as enjoyment, control and curiosity. More specifically, Agarwal and Karahanna claim that non-instrumentality can work as a driver to start technology usage. They claim that enjoyment and so-called flow are important factors in technology acceptance. Agarwal and Karahanna have utilized technology acceptance model (TAM) by Davis (1989) in the formation of their model. Davis (1989) claims that perceived usefulness and ease-of-use determine the intention to use technology. This model is one of the major contributions in information systems science field and has contributed in many further and remarkable research works (e.g. Compeau and Higgins, 1995; Goodhue

and Thompson, 1995; Venkatesh et al., 2003). Agarwal and Karahanna claim that cognitive absorption and the five dimensions they describe antecede the technology acceptance. They found that the hypotheses for cognitive absorption hold. (Agarwal and Karahanna, 2000)

Furthermore, most of the research conducted about technology usage concentrates on technology usage that is non-mandatory, i.e. the usage that happens on free-time. Little research is made about mandated, work-related technology usage from hedonic theoretical point of view. The understanding of non-instrumental factors in mandated technology usage is important because service providers need to understand all the factors that affect the technology usage. By noticing that hedonic factors also affect the mandated IT usage, the service providers can better respond to user needs and shape the holistic user experience.

There were several motivations to conduct this study: 1) Importance of cash flow estimations, 2) a need for better cash forecasting information systems, and 3) study hedonic factors under mandated information system usage.

Because there has been a dominant assumption that individuals expect to gain instrumental value from the usage of technology, the perspective of this research was the opposite. This study examined the possible appearance of hedonic factors. As technology usage becomes more dominant in every segment of a company, it is possible that the motivation for usage is, besides utilitarian, also hedonic. In this research, the technology under study was mandatory IT, which furthermore gave this research a special dimension.

1.2 Research objectives and questions

The objective of this study was to examine whether the non-instrumental factors that Agarwal and Karahanna presented in their research determined the use of cash flow estimation systems and the intention to continue the system usage. The purpose was to study if the intentions to use technology could include hedonic factors besides the traditionally viewed utilitarian factors.

The theoretical framework of this research was based on two different scientific disciplines: Accounting and information systems science. Cash flow estimation

represented the accounting point of view and cognitive absorption theory represented the information systems point of view. Between these two disciplines stands accounting information systems (AIS), which was also discussed shortly.

Based on the background information presented above, the research questions of this study were divided as follows:

- (1) Does cognitive absorption emerge in work-related system usage?
- (2) Does cognitive absorption affect the intention to continue or discontinue the use of cash flow estimation systems?

These questions were studied through qualitative case study. The results were analyzed based on six case company interviews. The interviews were conducted with the key persons, who were in charge for conducting the cash flow estimation in the company. Most of the interviewees were chief financial officers. Companies were from different industries and varied in size.

The specific target group of this research was private equity financed companies. Private equity financed companies find cash flow estimation highly important, since the equity owners require the implementation of forecasting. Therefore, private equity financed companies created a suitable research group for this study. The CEO of the private equity investment company was also interviewed.

Qualitative approach to this topic generated more detailed results, as the interviewees got a chance to give their opinions in more detail than what a quantitative questionnaire would have given. Particular answers enabled the results to be exploited more efficient in practice. In addition, in depth interviews with key persons offered a better basis to adapt the theoretical framework of cognitive absorption to this study.

The main finding of this research was that cognitive absorption, i.e. deep attention in software might affect also mandated, work-related, rational information system usage. However, hedonic factors are not the only factors influencing it. In other words, utilitarian factors are still a primary reason to start and continue technology usage. The result showed that hedonic and utilitarian factors can coexist, users do

experience emotions with also work-related information system usage and the motivation to continue system usage can be both hedonic and utilitarian.

1.3 Structure of the thesis

The literature review of the thesis was divided in three parts. Chapter 2 and 3 focuses in cash flow estimation and accounting information systems. Chapter 4 handles the actual theoretical framework, which was cognitive absorption.

Chapter 5 defines qualitative comparative analysis and coding technique, which were the methodological frameworks for this study.

Results have been divided in four subchapter and they are presented in chapter 6. In chapter 6 case company profiles, private equity investor interview and the case company interviews are analyzed. Case company interviews were analyzed in two sections, the first section focuses on cash flow estimation information systems and the second one focuses on cognitive absorption.

Finally chapter 7 summarizes this research with the conclusions.

2 Cash flows and cash flow estimation

This chapter starts the review of literature by discussing about the main topic of this research - cash flows and the estimation of them.

Firstly, the foundation of cash flow estimation is explained, after which cash flows and cash flow estimation is defined in more detail. At last the significance of cash flow estimation is discussed in a subchapter that looks at the issue from financial planning point of view.

2.1 Foundation for cash flow estimation

The foundation for cash flow estimation can be rationalized with the help of a cycle of a company. The cycle of a company takes a look at the processes of a company at very general level. However, it helps understanding the creation of the cash flows and is therefore useful in this context.

In economics, the processes of a company can be divided in two segments: Real process and money process. Real process consists of processes that include inputs for production. Money process consists of processes that include the purchase of the inputs. These two processes create circulation, which Ikäheimo et al. (2009) call the cycle of a company. According to Moghaddam (2010), there is empirical support that money is also a factor of production. Moghaddam suggests that demand for money is a by-product of profit maximization in the same manner as demand for any other normal production factor. Therefore money and production factors are not always distinguished. (Moghaddan, 2010)

The cycle of a company described by Ikäheimo et al. (2009) starts from the purchase of an input. Purchase of an input creates an expense, which is reflected on the money process as a cash disbursement, i.e. cash payment. Inputs are further processed to a service or a good, i.e. output. Output will eventually create revenue, as it shifts to end-user at the market. This revenue will be reflected on money process as a cash receipt, i.e. received cash. (Ikäheimo et al., 2009) Managing the collection of cash receipts effectively is as important as minimizing cash disbursements. One of the most important things in minimizing cash disbursement

outflows is to not pay too early. Also, ensuring the proper prices and quantities of goods helps a company to control the costs, profits and therefore, cash flows. (Reider, 2008)

Figure 1 illustrates real process and money process as a cycle of a company from accounting point of view. From the figure one can see the logic behind expenses, revenues, cash receipts and cash disbursements of a company.

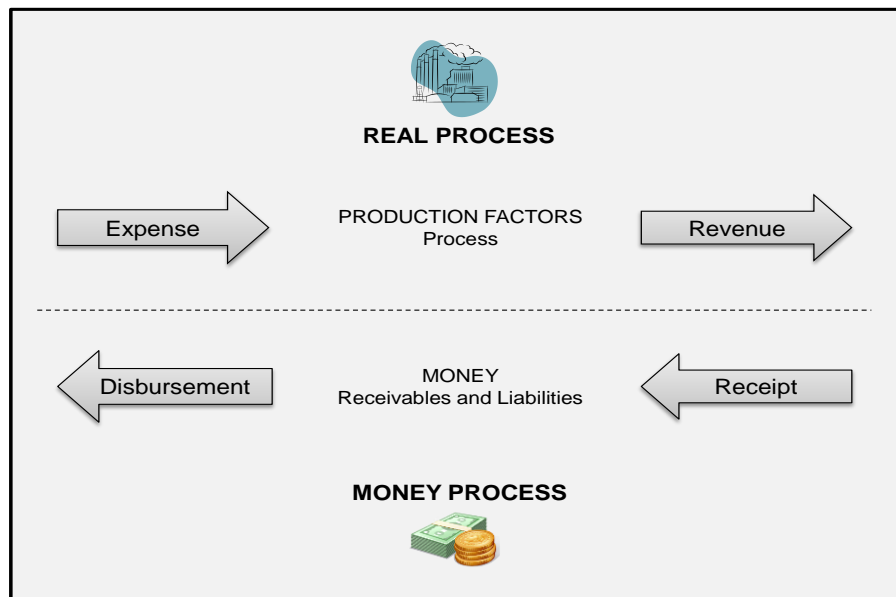


Figure 1. The cycle of a company (modification from Ikäheimo et al., 2009)

To initiate the cycle of processes, a company needs capital. The supply and demand of money converges at the financial markets. A company can find two different types of capital from financial markets: Equity capital and financial capital.

Equity capital represents money that has been invested in the company by the owners. In response to the risk that the investment creates, owners receive shares of the company, possible profit in the aftermarket of the shares and yearly paid dividends. In financial distress companies tend to reduce dividends and therefore, the distributions are smoothed relative to earnings (Gryglewicz, 2011). Equity capital investors carry a bigger risk than financial capital investors.

Financial capital represents money that has been invested by non-owners. Financial capital investors also require compensation for their risk. This compensation is normally in the form of an interest. (Ikäheimo et al., 2009)

According to Gryglewicz (2011), the liquidity and solvency of the company have an impact on capital structure. His findings state that liquidity concerns of a company lead to decreased dispersion of credit spreads.

It is important to notice that normally money is not transferred at the same time with the transaction. In this case company is left with accounts receivables, i.e. money to receive, or accounts payables, i.e. money to pay. Eventually these events get a form of a cash disbursement or a cash receipt. Meanwhile, company marks them as a receivable or a payable. These two income statement items are part of earnings management and therefore, also cash management. (Marquardt and Wiedman, 2004)

Forecasting the cash inflows and outflows from real process, money process and financial markets helps company to plan their business better. According to Mackevičius and Senkus (2006), “company’s solvency, profitability and continuity of its activity depend upon the company’s cash flows” (p. 173).

Next subchapters introduce the more exquisite definitions for cash flows and cash flow estimation.

2.2 Definition of cash flow

Cash flows can be defined as “the inflows and outflows of cash and cash equivalents created of the operating, financial, investment and extraordinary activities of the company” (Mackevičius and Senkus, 2006, p. 171).

Two most important criteria to classify cash flows are classifying them according to the types of activity and classifying them according to the time duration. Time duration can simply be divided in short-term and long-term cash flows. (Mackevičius and Senkus, 2006). Later on in subchapter 2.3 we will see that cash flow estimation can be divided in three time horizons, which is normally the most used division.

Livnat and Zarowin (1990) present a comprehensive categorization of different cash flows based on the activity type. Their categorization is similar to the one of Mackevičius and Senkus (2006) and is also same classification that is used in International Financial Reporting Standards (IASB, 2009). Based on this, Livnat and

Zarowin divide cash flows into operating, financing and investing cash flows and their sub-components.

To form a more exquisite idea about cash flows, it is useful to take a closer look into the components. Table 1 illustrates the cash flow classification of Livnat and Zarowin (1990).

Table 1. Components of cash flow (modified from Livnat and Zarowin, 1990).

| COMPONENTS OF CASH FLOW | | |
|--|---|---|
| OPERATING CASH FLOW | FINANCING CASH FLOW | INVESTING CASH FLOW |
| Collections from customers | Cash received in net debt issuance | Cash used for new real property investments |
| Payments to suppliers, employees, etc. | Cash received in net-preferred-stock issuance | Cash used for business acquisitions |
| Tax payments | Cash received in net common-stock issuance | Cash investments for minority shareholder interest |
| Net interest paid | Dividends paid | Cash investments in new unconsolidated subsidiaries |
| Other operating cash flows | | Cash obtained from retiring real property investments |

Next subchapter defines cash flow estimation and the different time horizons and techniques of it.

2.3 Definition of cash flow estimation

Cash flow estimation or cash flow forecasting can be defined as the projection of cash flows (Ochs and Parkinson, 2006). De Caux (2005) divides cash forecasting into three time horizons: (1) Short-term forecasting, (2) medium-term forecasting and (3) long-term forecasting. In De Caux's division short-term forecasting covers estimations for periods up to one month. Medium-term forecasting estimates cash for periods from one to 12 months. Long-term forecasting again covers periods longer than one year. (De Caux, 2005). Each of these time horizons have different preferred forecasting techniques. According to KPMG's (2009) survey about cash forecasting, most companies use short-term forecasting when they estimate the future cash flows.

Cash flow estimation techniques can be categorized in multiple different ways. Gallanis (2003), for example, suggests that most cash forecasting methods fall into three types: (1) Receipts and disbursement approach, (2) statistical techniques or (3) balance sheet approach. Also De Caux (2005) mentions these techniques in his publication and further explains, that receipts and disbursement model is the most used method in the short-term and medium-term forecasting. He also explains that balance sheet approach is especially used in long-term forecasting. However, Higdon (2011) approaches cash flow estimation techniques from different point of view. He classifies cash forecasting to (1) ground-up forecasting, (2) top-down forecasting and (3) statistical modeling.

The major difference between these two classifications is that Gallanis' classification is a general approach, in which most of the methods can be executed with the help of common spreadsheet software, such as Microsoft Excel (Gallanis, 2003). According to previous research, this method still seems to be the most common forecasting software (Kangas, 2011; Basware, 2010). Gallanis' forecasting methods can be seen suitable especially for smaller and medium sized companies (SMEs), as applying spreadsheet solution does not require additional investments in the software. The forecasting requirements are less complex in SMEs case, which also supports the use of spreadsheet solution. On the contrary, Higdon's (2011) classification is from corporate treasury's point of view, which implies that this classification is more suitable for larger or consolidated companies.

The unifying factor of these categorizations is that Gallanis and Higdon both mention statistical approach in their classification. They also mention that statistical modeling can be either used separately or then combined with other forecasting methods (Gallanis, 2003; Higdon, 2011).

Comparison of these two categorizations gives a good example of cash flow estimation classification from both small and medium sized companies' perspective, as well as large and consolidated companies' perspective.

Table 2 explains in more detail the methods of these two different categorizations.

Table 2. Classifications of cash flow estimation (modified from Gallanis, 2003 and Higdon, 2011).

| Classifications of cash flow estimation | | | |
|---|---|--------------------------------|--|
| Gallani's classification (2003) | | Higdon's classification (2011) | |
| 1. Receipts and disbursements approach | <ul style="list-style-type: none"> - Known cash flows are put into "cash flow calendar", then unknown flows are estimated based on history - Represents any period of time wanted | 1. Ground-up forecasting | <ul style="list-style-type: none"> - Business units deliver their own forecasts - Corporate treasury unit compiles them |
| 2. Statistical techniques | <ul style="list-style-type: none"> - Two of the more common: time series method and regression models - Time series method predicts a response in a variable over time (smooths seasonal effects) - Regression model defines the relationships between variables | 2. Top-down forecasting | <ul style="list-style-type: none"> - Budgets work as a basis for the forecasts, - Forecasts allocated across the business structure |
| 3. Balance sheet approach | <ul style="list-style-type: none"> - Pro forma (excludes unusual events) balance sheet is conducted with past information and future expectations - Cash is handled separately and "book" cash, i.e. financial statement cash is estimated | 3. Statistical modelling | <ul style="list-style-type: none"> - A bottom-up approach - One or more models - Forecasts based on history - Examples: Linear growth pattern model, moving average model, linear regression modelling or seasonally adjusted trends |

Gallanis' and Higdon's suggestions provide just two viewpoints to the topic. However, these viewpoints give an idea about different types of cash flow estimation implementation.

Cash inflow and outflow estimation provides the basis for financial planning of the company. Next subchapter focuses on reasoning the importance of cash flow estimation.

2.4 The significance of cash flow estimation in financial planning

According to cash and working capital management research conducted by KPMG (2009), cash management is gaining ever more importance from management. The research of KPMG was conducted among 350 finance executives from large European, US and Canadian companies. 58 % of the survey respondents said that

cash management ranks among top strategic priorities and 28 % said that it is their number one priority. However, according to this survey cash flow forecasting is still not enough accurate. Namely, 72% of the respondents said they missed their cash flow forecasts, and 24 % said they missed their forecasts by 20 % or more. The results refer to the reality, that although forecasting is acknowledged necessary, accurate cash flow forecasting is challenging. The explanation for this might be company's profile, i.e. management of financial activities, the field of business the company works in, corporate climate or the amount of excess cash, short-term debt or scattered data, which is difficult to gather for forecasting purpose (Ochs and Parkinson, 2006).

As KPMG's research proved, managers around the world acknowledge the challenging nature of cash forecasting, but also they acknowledge cash management highly important. In order to maintain their solvency and liquidity, i.e. ability to pay, company has to plan their future from financial aspect. Asp and Torkko's (1977) literature about a company's financial planning also states that one of the main problems that a company encounters is how to keep liquid assets on a sufficient level. In addition, they mention that making profitable decisions, such as investments, is problematic. Cash flow estimation support company's decision making in all these aspects.

Asp and Torkko (1977) further divide financial planning on two different time horizons: Short-term financial planning and long-term financial planning. In their literature, short-term financial planning focuses on the liquidity planning of the company. Long-term financial planning includes decisions about investments, dividends payouts and other financially remarkable transactions. Both of the planning methods share one common target, which is to keep adequate level of money reserves in the company continuously. (Asp and Torkko, 1977) In general, both kind of planning prevents a company ending up in financial problems. Cash flow estimation is part of the planning function and therefore forecasting links to financial planning strongly.

The significance of cash flow estimation within these two different time horizons of financial planning is discussed in next subchapters. The time horizons are divided in

two, so that liquidity management represents short-term financial planning and investment decision making represents long-term financial planning. Several different sources support such a division of financial planning (e.g. Campello et al., 2011; Asp and Torkko 1977), and therefore it is the reason for the similar division in this context as well. One should, however, note that cash flows can be divided in three categories, i.e. operating, financing and investing cash flows, as earlier mentioned (Mackevičius and Senkus, 2006; Livnat and Zarowin, 1990). The first one represents short-term financial planning and latter two represent long-term financial planning.

2.4.1 Cash flow estimation in liquidity management

Liquidity refers to “the ability of a company to repay its obligations when they come due” (Montigelli, 2010, p. 359). One of the most important targets of the company is to maintain its ability to pay. For this purpose, company can conduct a liquidity budget, in which the information that cash flow estimations provide work as a foundation. Liquidity budget can be outlined for the whole fiscal year; however shorter time period is more accurate. Therefore liquidity budget is normally prepared up to several months. (Asp and Torkko, 1977)

In general, budget is defined as “a quantitative expression of a proposed plan of action by management and is an aid to coordinating what needs to be done to execute that plan” (Horngren et al., 2012, p. 207). Company’s budgets can be further divided to sub-budgets and master budget. Master budget is based on the sub-budgets, which are called operating budgets and financial budget. Operating budgets culminates to budgeted income statement. Budgeted income statement holds under all the operative level budgets from revenues to distribution. Financial budget again represents the cash point of view and therefore includes capital expenditures budget, cash budget, budgeted balance sheet and budgeted statement of cash flows. Master budget is usually prepared for one fiscal year. (Horngren et al., 2012) Companies can use budgets as a foundation for cash flow estimation and liquidity planning.

All the budgets link to each other. The short-term financial planning starts from calculating the operating budgets. Operating budget is a planning tool for the real process events. Real process, which was discussed earlier in subchapter 2.1,

consists of the operative level functions of the company that produces an output, for example a service or a good, from an input, for example material or labor. After defining different operating budgets company will make forecasts for the future cash flows. Cash flow forecast defines the possible financial surplus or deficit of the operations. If the cash flow estimation results are negative, company has to adjust their operating budget. If the estimations indicates surplus, company can move on to calculating liquidity budget. (Asp and Torkko, 1977)

Figure 2 shows the process of short-term financial planning from the liquidity budgeting point of view.

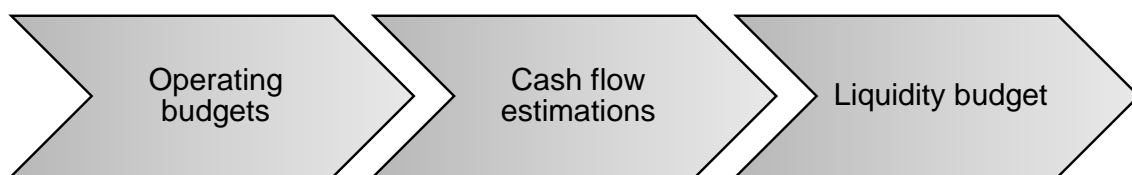


Figure 2. Short-term financial planning (modified from Asp and Torkko, 1977).

Cash flow estimation is closely related to budgeting. It provides detailed information about the expected expenses and revenues. Budgets are closely related to the strategy, which again defines the future state of a company.

2.4.2 Cash flow estimation in investment decision making

This subchapter explains the role of cash flow estimation in investment decision making. As mentioned earlier, besides maintaining liquidity financial planning and cash flow estimation support long-term decision making as well. According to Asp and Torkko (1977), long-term financial planning includes decisions about investments, dividends payouts and other major decisions that go beyond one day or one week. Also KPMG's (2009) research stated that cash flow forecasting is a valuable management tool, which enables companies to make informed decisions. Further, Regino (2010) supports this result by stating that cash forecasting has become a vital support for business decisions (Regino, 2010).

Long-term financial planning is normally made for one fiscal year up to five years. The difficulty in long-term financial planning is the accuracy of the cash flow

estimations. Since investment decisions are done in the long run, the accuracy decreases. In other words, the further the forecasting goes the bigger risk for inaccuracy exists. (Asp and Tarkko, 1977)

According to Mackevičius and Senkus (2006), cash flows, which relate to investment activities, are born from (1) acquisition and sales of intangible and tangible long-term assets, (2) acquisition and sales of securities of other companies, (3) granting of the loans to the other companies and (4) return of the loan granted to other companies. Table 1 in subchapter 2.2 also described these cash flows.

Cash flow estimation plays a role in decision making. It can be positioned in the middle of decision making process. Horngren et al. (2012) describe a five-step decision making process, in which step three represents making predictions about future.

Figure 3 illustrates the decision making process and shows the position of future prediction in the process (Horngren et al, 2012).



Figure 3. Five-step decision making process in accounting (modified from Horngren et al., 2012).

According to Horngren et al. (2012), the decision making process begins by identifying the current incapability (Step 1). Incapability could be, for instance, inability to produce certain product enough and therefore respond to the demand at satisfactory level. Company could decide to buy a production machine to increase the production and revenue. To make such a decision manager needs to obtain information about the investment (Step 2). Normally most information relates to costs, since the profitability of the investment solves whether it is carried out or not. After obtaining information from the past and present, manager needs to make predictions about the future (Step 3). These predictions are based on the previously

obtained cost information. Cost information is exploited in generating cash flow estimations considering the decision. In production machinery's case, company would need to acknowledge all the cash flow relating to the actual investment in relation to the income cash flows it creates. This measure is also called return on investment (ROI). Based on cash flow estimations and profitability calculations manager finally makes the decision and either implements or unimplemented the investment (Steps 4 and 5). (Horngren et al., 2012)

This chapter explained the meaning of cash flows and the importance of estimation in liquidity management and investment decisions. Next chapter will combine the two main themes of this research paper, which are accounting and information systems.

3 Accounting information systems

After explaining the accounting terminology relating to cash flows, this chapter shortly explains the meaning of accounting information systems (AIS). Accounting information systems fall between the two main themes of the theoretical base of this research, which are accounting and information systems science. Therefore, it is useful to take a closer look at accounting information systems.

3.1 Definition of accounting information systems

Accounting information systems as a term has many synonyms. In some literature electronic accounting is used, as well as digital accounting (Deshmuk, 2006). Deshmukh defines digital accounting as “representation of accounting information in the digital format, which then can be electronically manipulated and transmitted” (p. ix). Accounting information systems (AIS) is however used widely (Bagranoff et al., 2010; Hollander et al., 2000). Bagranoff et al. define accounting information systems as “a collection of data and processing procedures that creates needed information for its users” (p. 5). They further mention that AISs can also be viewed as a set of five interacting components: (1) Hardware, (2) software, (3) data, (4) people and (5) procedures.

Bagranoff et al. (2010) also suggest that AISs stand in the crossroads of the disciplines of accounting and information systems. These two disciplines form the theoretical foundation for this research. Figure 4 illustrates the intersection presented by Bagranoff et al..

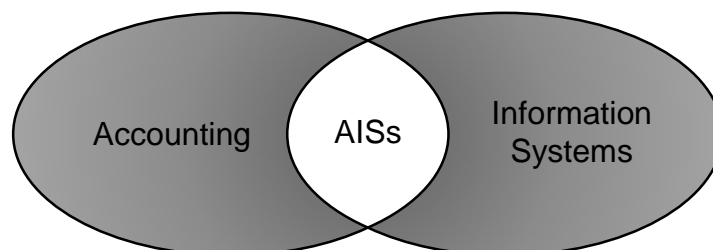


Figure 4. Accounting information systems (Bagranoff et al., 2010)

Since the term “accounting information systems” is widely used to describe any system or software that generates accounting information, it is useful to take a closer look at the different forms of AISs. Next subchapter handles this topic closer.

3.2 Different forms of accounting information systems

Accounting and information technology have been closely related for a long time, although people associate accounting information systems to the recent developments of information technology. Already from the late 1950s, along with the emergence of mega corporations, accounting information has been a potential candidate for automation. As a matter of fact, it can be said that the digital exchange of accounting data begun already in the late 1940s, as the basic idea for Electronic Data Interchange (EDI) was formed. EDI is still used as a main data transmission form between many companies. (Deshmukh, 2006)

Besides EDI new forms of data transmission have occurred and are now used simultaneously. Enterprise Resource Planning (ERP) systems represent one of these new types of data transmission systems. ERP solutions started to gain more popularity in the 1990s, when they were widely implemented in international companies (Grabski et al., 2011). ERP models attempt to “integrate organizations and their functions onto a single integrated hardware/software solution that can serve all of the various organizational needs” (Stephenson and Sage, 2007, p. 82). One example of such a system is a software product called SAP R/3. It combines accounting, manufacturing and human resource subsystems into an enterprise-wide information system. (Bagranoff et al., 2010)

Grabski et al. (2011) write that ERP systems are actually one of the factors that pressure accounting profession to change, since accounting activities are increasingly integrated to ERP technology. They state that accounting functions are expected to make ever bigger contribution to the rest of the company functions, such as providing management consulting services. (Grabski et al., 2011)

ERP is now the most dominant integrative information system in most large companies and is also gaining bigger importance in SMEs (Grabski et al., 2011). Grabski et al. mention that the accounting discipline is also placing new demands on ERP systems. For instance, use of certain reporting language, such as Extensible

Business Reporting Language (XBRL), is now being adopted by European regulators as a data standard for the exchange of business information (Locke and Lowe, 2007). This makes ERP to support automated identification and online transfer of financial reporting data better (Grabski et al., 2011).

Another significant change in ERP systems nowadays is the way they are being delivered. Namely, ERP systems are increasingly delivered through cloud computing. This means that the software is delivered rather as a service than a concrete product. This kind of business solution is also called SaaS service (Software as a Service). If ERP solution is delivered as a SaaS service, the provider customizes the software to customer's needs, provides an access to the application and hosts the data on the Internet. (Grabski et al., 2011) Cloud computing is a flexible and more efficient way to maintain the service from service provider's and user's point of view.

Previously explained forms of data transmission are the most commonly known accounting information system implementation methods. Next subchapter discusses about the business case of these systems.

3.3 Business case of accounting information systems

The main objective of electronic accounting is to increase the efficiency of the accounting processes and to decrease the amount of errors. Another important dimension that such information systems enable is the real-time reporting of the data (Bagranoff et al., 2010). In addition, Bagranoff et al. mention that accounting information system decreases the manual work by for instance predicting future cash payments and their dates automatically with a computerized system. All of these qualities are highly valuable in cash flow estimation process.

Since the software requires big investment from the company, the managers have to evaluate the benefits and costs of the purchase. In other words, managers need to see the business case of such systems. Deshmukh (2006) has listed the benefits and costs that are typical for electronic accounting. Table 3 describes the business case of accounting information systems.

Table 3. Costs and benefits of electronic accounting (modified from Deshmukh, 2006).

| ELECTRONIC ACCOUNTING | |
|--|--------------------------------------|
| BENEFITS | COSTS |
| Faster transaction cycle times | Investments in hardware and software |
| Broader geographic reach | Pricey consultants |
| Continuous service availability and access | System and process costs |
| Reduced error rates | Continual training |
| Improved productivity | User resistance |
| Better cash management | Possible ERP/legacy integration |
| Paper cost savings | |
| Improved audit trails and security | |

The costs and benefits that Deshmukh has listed can be adapted to electronic accounting in general or then to a single specific function inside electronic accounting. For instance, in cash flow estimation's case the possible benefits can be broader geographic reach, reduced errors and better cash management. Possible costs could be the money put in the investment itself, user resistance and possible integration costs to other systems. Therefore, the business case of such systems can be evaluated based on this more general listing.

This chapter defined accounting information systems and the business case of them. Next chapter presents the information system related theoretical framework of this research work, which will be the last part of literature review.

4 Cognitive absorption of technology

Most of the research in information systems science field that handles the factors, which have an effect on user's intention to take information technology initially in use concentrates on the influence of attitudes and beliefs on IT adoption. They don't examine what shapes these psychological states, but rather how they influence the intention to take technology in use. Theoretical models that all strive to explain the influence of attitudes and beliefs toward new information technology are for example innovation diffusion theory (Rogers, 2003), the technology acceptance model (TAM; Davis, 1989), the theory of reasoned action (TRA; Ajzen and Fishbein, 1980) and the theory of planned behavior (TPB; Ajzen, 2005).

Moreover, a dominant foundation of these theories is that individual's behavior toward IT is led by instrumental variables (Agarwal and Karahanna, 2000). Instrumentality can for instance refer to certain performance expectancy, image enhancement, pay achievement or gaining a promotion (Magni et al., 2010). In other words, most theories about user's technology adaptation make an assumption that user is motivated to take the technology in use only to obtain external rewards.

Cognitive absorption (CA) theory (Agarwal and Karahanna, 2000) takes an opposite approach towards this topic. Cognitive absorption examines technology adaptation from psychological standpoint without ignoring the instrumental standpoint. It means that this specific theory attempts to focus on the comprehensive, holistic user experience with IT by acknowledging also the non-instrumental variables, such as enjoyment, control and curiosity that information technology could arouse in the user. (Agarwal and Karahanna, 2000)

Following subchapters are going to present the definition of cognitive absorption, the theoretical base of cognitive absorption, the role of cognitive absorption in intentions to use information technology and the role of cognitive absorption in continuing the information technology use.

4.1 Definition of cognitive absorption

The major work about cognitive absorption theory in information systems science field is conducted by Agarwal et al. (1997) and Agarwal and Karahanna (2000). Agarwal et al. (1997) and Agarwal and Karahanna (2000) define cognitive absorption as “a state of deep involvement with software” (p. 294; p. 673).

According to Agarwal and Karahanna (2000) cognitive absorption is “an intrinsic motivation related variable” (p. 666). This means that user’s motivation is not to seek instrumental value only. In other words, motivation is rather intrinsic than extrinsic. According to Vallerand (1997), intrinsic motivation occurs when “behavior is performed for itself, in order to experience pleasure and satisfaction inherent in the activity” (p. 271). Magni et al. (2010) write that intrinsic motivation is hedonic behavior where individual’s behavior is driven by the motivation to be engaged in “enjoyable, self-determined activities” (p. 575). Therefore, cognitive absorption can be defined as a result of hedonic behavior driven by intrinsic motivation and resulting as deep involvement in software.

Magni et al. (2010) also write that “hedonic factors affect behavior by providing intrinsic value, whereas instrumental factors affect behavior by providing utilitarian value” (p. 574). Based on this can be said that hedonic factors relates to non-instrumentality and intrinsic motivation, whereas utilitarian factors relates to instrumentality and extrinsic motivation. Some authors divide hedonic and utilitarian factors further in rational and non-rational (for example Liao et al., 2011). Irrational factors are described as aesthetic features of the IT, occurrence of playfulness and experienced pleasantness (Liao et al., 2011), whereas rational factors are described as those that Davis lists in his theory of technology acceptance, such as perceived usefulness (Davis, 1989). The technology acceptance model of Davis is further explained in subchapter 4.3, which handles cognitive absorption’s position as an antecedent for intention to use technology.

Agarwal and Karahanna (2000) have pointed five dimensions to cognitive absorption in their study. These dimensions form cognitive absorption and are a prerequisite for experiencing it. The dimensions of cognitive absorption can be seen from figure 5.

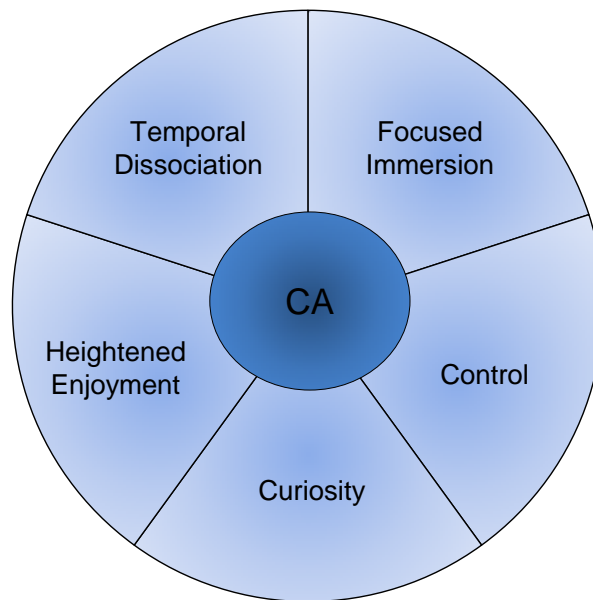


Figure 5. The dimensions of cognitive absorption (modified from Agarwal and Karahanna, 2000).

First dimension, temporal dissociation, refers to individual's inability to notice the passage of time while engaged in software usage. Second dimension, focused immersion, means the total focus or engagement in software usage, when everything else around is ignored. Third dimension includes the notion of control, meaning the user's experience being in charge of the software usage. Fourth dimension, that is curiosity, refers to the curiosity that the usage arouses in individual. Fifth dimension consists of heightened enjoyment, simply meaning the pleasurable aspects of the usage. (Agarwal and Karahanna, 2000)

4.2 Theoretical base for cognitive absorption

The theoretical base for cognitive absorption is derived from individual psychology. Agarwal and Karahanna list three theoretical work that work as a base for cognitive absorption: (1) The personality trait of absorption, (2) the state of flow and (3)

cognitive engagement. (Agarwal and Karahanna, 2000) To understand these concepts better it is necessary to define them closer.

4.2.1 The trait of absorption

The first theoretical work that serves as a foundation for cognitive absorption in Agarwal and Karahanna's work handles the personality trait of absorption.

Absorption can be defined as deep attention and engagement in the activity that an individual is involved in (Agarwal and Karahanna, 2000). As a matter of fact, Tellegen and Atkinson, who were first to study the trait of absorption in more depth, found that absorption and susceptibility to the state of hypnosis are positively correlated. They also described absorption as a personality trait. (Tellegen and Atkinson, 1974) Nadon et al. (1991) has reaffirmed this validity of absorption as a dimension of personality and as a predictor of hypnotic responsiveness in their study. The relation of absorption and hypnosis can refer to the fact that an absorptive person is more likely to focus deeply on software usage.

To enable the measurement of the personality trait of absorption, Tellegen has developed a scaling tool. Tellegen Absorption Scale (TAS) consists of nine categories that is measured in individual: (1) Responsiveness to engaging stimuli, (2) responsiveness to inductive stimuli, (3) thinking in images, (4) an ability to summon vivid and suggestive images, (5) a tendency to have cross-modal or "multi-sensory" experiences, (6) an ability to become absorbed in one's own thoughts and imaginings, (7) a tendency to have episodes of expanded awareness, (8) an ability to experience altered states of consciousness and (9) an ability to re-experience the past. All of these categories have strong characteristics from human psychology. TAS has later on been widely agreed as a useful tool to measure the trait of absorption. (Agarwal and Karahanna, 2000)

According to Agarwal and Karahanna, some people are more likely to have absorption as a personality trait than the others. This suggests that only certain people would be able to experience state of deep involvement when using IT. This is an important finding if deep involvement in technology usage plays a role, and as in many studies it has proven to do, in the user's intention to continue usage in the

future. Without deep involvement with the software the user is not able to commit to specific software and therefore, is more sensitive to change the service. This is crucial information especially for the service provider. Cognitive absorption as a determinant for continual usage will be handled more closely in subchapter 4.4.

4.2.2 The state of flow

Research made about the state of flow serves as the second theoretical foundation for cognitive absorption.

Csikszentmihalyi (1990) describes flow as joy, creativity and the process of total involvement. Csikszentmihalyi explains that the optimal experience is based on the concept of flow – the state in which people are so involved in an activity that nothing else seems to matter because the experience itself is so enjoyable.

Csikszentmihalyi found in his studies that every flow activity provides sense of discovery and a creative feeling of transporting the person into a new reality. This certain flow activity in other words pushes the person to higher levels of performance. However, according to Csikszentmihalyi not everyone is capable of experiencing flow. This condition can also be called anhedonia, which means lack of pleasure. Incapability to experience flow or have absorption as a personality trait can become an obstacle to commit to certain service usage.

The importance of flow in human-technology interactions has been widely studied. Trevino and Webster (1992), for example, have described four dimensions of flow in the information technology usage. These dimensions are: (1) A control dimension, (2) an attention focus, (3) a curiosity dimension and (4) an intrinsic interest dimension. If these four dimensions, control, attention, curiosity and interest occur, the person is likely to experience flow.

Because flow is in a relation to a deep user concentration, flow can be seen as an important factor to the overall experience of IT usage. Novak et al. (2000) studied the factors that influence the formation of flow and create a compelling user experience in the online environments. They found that compelling online customer experience is positively correlated with fun and experiential use of the Web and the expected use in the future. However, this correlation was negative with work-related activities.

They also hypothesized that greater flow would correspond to greater positive subjective experiences, but could not test this hypothesis. (Novak et al., 2000) Earlier research suggests that this correlation exists though (Webster et al., 1993).

Pilke (2004) has also conducted a research about the flow experiences in information technology usage. She found out flow experiences resulting from variety of tasks are quite frequent but the most frequently mentioned activity was doing work. These work related tasks included for instance reading, writing and programming.

As a conclusion, state of flow has been widely studied and acknowledged important in defining the overall user experience in the information technology context.

4.2.3 Cognitive engagement

The concept of cognitive engagement forms the last theoretical work that Agarwal and Karahanna use as a base for defining cognitive absorption.

Cognitive engagement can be defined as sustained attention to a task requiring mental effort, intrinsic interest and curiosity (Scott and Walczak, 2009). According to Scott and Walczak, cognitive engagement is also associated with emotions.

In the research of Scott and Walczak (2009), the results implied that cognitive engagement has a positive effect on person's computer self-efficacy. Self-efficacy refers to the personal judgment of person's ability to use a computer system. Cognitive engagement can therefore have an effect on users intention to take technology in use, which again is significant information for service providers.

According to Agarwal and Karahanna (2000), it has been unclear whether cognitive engagement is distinct with the state of flow. However, cognitive engagement and state of flow are closely related and sometimes do overlap.

4.3 Cognitive absorption as an antecedent for intention to use IT

The existence of the five dimensions mentioned in subchapter 4.1 creates cognitive absorption. Agarwal and Karahanna suggest that the existence of cognitive

absorption and dimensions of it increases the probability of an individual to use certain new technology.

To illustrate this suggestion Agarwal and Karahanna have developed a theoretical model, which shows the causal relations of cognitive absorption with technology acceptance model, which was earlier built by Davis (1989). (Agarwal and Karahanna, 2000) Figure 6 illustrates this model.

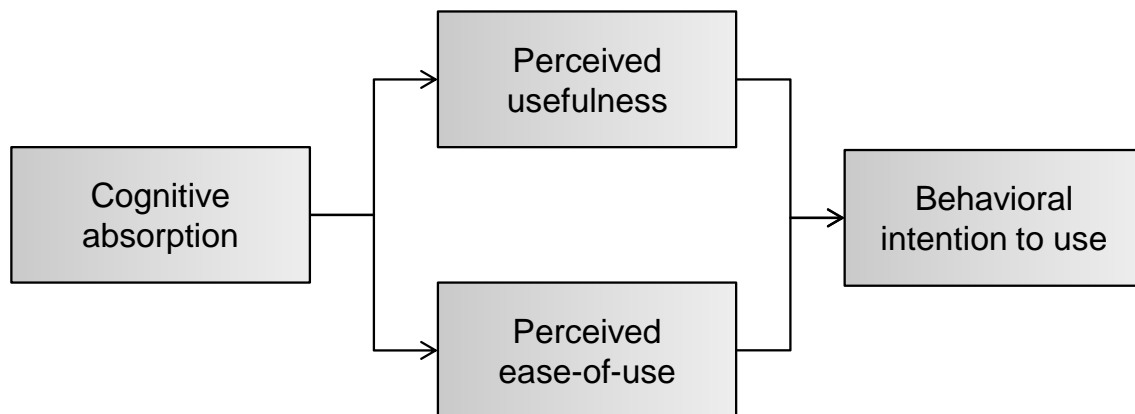


Figure 6. Theoretical model of cognitive absorption's effect on perceived usefulness and perceived ease-of-use (modified from Agarwal and Karahanna, 2000).

The theoretical model in figure 6 is simplified from the original one that Agarwal and Karahanna present in their research. In this model, the non-instrumental expectations and instrumental expectations are combined, where usefulness and ease-of-use represent the more technical qualities of the technology acceptance. Cognitive absorption explains the hedonic, less technical factors that antecede these more technical factors.

Besides these four factors in the figure, the authors also found that personal innovativeness and playfulness lead to stronger cognitive absorption and also that self-efficacy affects positively on the perceived usefulness and perceived ease-of use. (Agarwal and Karahanna, 2000)

The relations presented in the model of Agarwal and Karahanna were found to be accurate. This proposes that cognitive absorption is an important factor to be examined closer when analyzing the user's intention to use a technology. Cognitive

absorption antecedes the perceived usefulness and ease-of-use, which in turn correlates positively with person's intention to use the technology.

Magni et al. (2010) have also come up with similar results in their studies. In addition, they found that besides hedonic and instrumental factors coexist, the effect of them changes over time. This means that for instance the effect of personal innovativeness, which represents the hedonic factor, decreases over time, whereas the performance expectancy, which represents utilitarian factor, increases over time.

Karahanna et al. (1999) found similar results in a study which compared the beliefs and attitudes of pre-adopters, who were about to take an information system in use and post-adopters, who were already in a stage of making a decision of continuing the use of an information system. The results suggested that different stages in information technology adoption carry different factors, which have an effect on the decisions to either take a system in use or continue its usage. Social pressure was a determinant for pre-adopters, whereas attitude was a determinant for post-adopters. Surprisingly, the attitude of post-adopter was based on instrumentality beliefs about usefulness of the IT and perceptions of image enhancements that the use of a specific IT would possibly create. Non-instrumental factors therefore were secondary with post-adopters.

Agarwal and Karahanna studied cognitive absorption under voluntary use. However, a study conducted by Brown et al. (2002) suggests that technology acceptance in a mandated environment, such as it is often in many organizations, differs from that of in a voluntary environment. Brown et al. discovered that in mandated environment the basic relationships of technology acceptance model holds, but the factor of ease-of-use is more important than perceived usefulness in determining the intention to start technology use. In voluntary environment results have been reversed. In addition, according to Brown et al., in mandated environment user attitudes do not have significance in user's intention to start specific technology usage. Here user attitude refers to either a positive or a negative attitude toward the technology, which in turn define the acceptance of technology.

Relating to the theoretical model of cognitive absorption, a closer description of the factors of Davis's model needs to be provided. Next subchapters provide further discussion about perceived usefulness and perceived ease-of-use.

4.3.1 Perceived usefulness

Davis (1989) defines perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance” (p. 320). Enhanced job performance in turn normally leads to raises, promotions or other instrumental rewards (Davis, 1989). Perceived usefulness has found to be a predictor for intention to use technology, especially in an environment where the technology use is voluntary (Wu and Lederer, 2009).

Gu et al. (2010) have made a division of perceived usefulness. In their study Gu et al. divide perceived usefulness to perceived utilitarian usefulness and perceived hedonic usefulness. They claim that this division is important because recent ITs have both utilitarian and hedonic nature, and for that reason they call these ITs multipurpose information systems. They found that different user groups stress different type of usefulness, i.e. employees stress utilitarian usefulness more in their intention to use technology, whereas users that are intended to use IT on free-time stress more hedonic usefulness. (Gu et al., 2010)

4.3.2 Perceived ease-of-use

Davis (1989) defines perceived ease-of-use as “the degree to which a person believes that using a particular system would be free of effort” (p.320). Perceived ease-of-use has also found to be a predictor for user's intention to use technology, especially in voluntary technology usage environment (Wu and Lederer, 2009).

Venkatesh (2000) has further examined the determinants of perceived ease-of-use. He found similar results that Agarwal and Karahanna about the determinants of intention to use information technology. Namely, according to Venkatesh, internal and external control, intrinsic motivation and emotion are antecedes of perceived ease-of-use. From these factors control refers to computer self-efficacy and facilitating conditions, motivation refers to computer playfulness and emotion refers

to computer anxiety. However, Venkatesh suggests a model where these factors are determinants of perceived ease-of-use only.

Also Agarwal and Karahanna have found support for these factors affecting intention to use information technology. These factors were earlier explained more specifically in subchapter 4.1, in which the dimensions of cognitive absorption were described. However, Agarwal and Karahanna's perspective to the topic is distinguishable to Venkatesh's perspective. Agarwal and Karahanna claims that these determinants are antecedents of both perceived usefulness and perceived ease-of-use, not only one of them like Venkatesh claims.

Beaudry and Pinsonneault (2010) have also found support for the effect of emotions on initial IT use. They explored the relationship of excitement, happiness, anger and anxiety to IT use and found that excitement, happiness and anger are positively related to IT use, although anger and excitement are indirectly related. Anxiety again was negatively related to IT use. This result is logical, since anxiety is a result of deterrence emotions. (Beaudry and Pinsonneault, 2010)

Next subchapter discusses about the significance of cognitive absorption in the intention to continue the system usage.

4.4 Cognitive absorption as a determinant for continual IT usage

Besides playing an important role in the overall intention to use the technology, some researchers have found proof that cognitive absorption also has a significant role in the intention to continue the technology usage (Deng et al., 2010; Liao et al., 2011; Magni et al., 2010; Ortiz de Guinea and Markus, 2009).

Deng et al. (2010), for instance, found that the stronger the feeling of deep involvement or cognitive absorption the user has with IT usage, the more likely the user feels that he or she perceives high utilitarian or hedonic value or performance of IT. This again leads to higher positive excess of expectations, which leads to higher satisfaction and bigger probability to continue the usage of IT.

Liao et al. (2011) also stress the importance of cognitive processes in the repeated IT usage. They argue that when behavior is repeated and becomes habitual, it is guided by automated cognitive processes rather than rational decision making. Habit

again, is a critical factor to continue the usage. Liao et al. also claim that habit is an antecedent to perceived usefulness, a factor earlier presented by Davis (1989).

Furthermore, Magni et al. (2010) have conducted a research about the coexistence of hedonic and utilitarian factors in the process of taking technology in use and continuing its usage. In this study, Magni et al. state that individuals, who experience a positive cognitive state, are more likely to continue the IT usage.

Finally, Ortiz de Guinea and Markus (2009) have made a study about determinants of continual IT usage. The study is based on different information systems literature about continual IT usage. In all this literature the importance of habitual behavior as a determinant to continue the IT usage is being emphasized. Ortiz de Guinea and Markus's conclusion is that reasoned actions, such as TAM and its variants are necessarily not the most useful theories to explain continual IT usage. Instead, focus should be more on user's behavioral, non-rational factors. For instance, Ortiz de Guinea and Markus argue that emotions may drive continuing IT usage directly, rather than indirectly.

The similarity for the above mentioned studies is that they all have been conducted under voluntary IT use environment only. Sørenbø and Eikebrokk (2008), in turn, have studied the intention to continue information system usage under mandated conditions. Sørenbø and Eikebrokk found that user satisfaction is an adequate criterion to evaluate the probability of a user to continue the system usage. The focus of the study was finding the strongest determinants of the user satisfaction. Confirmation of the expectations from prior use, perceived usefulness and ease-of-use were being explored. The results suggest that ease-of-use is the primary determinant on user satisfaction. User satisfaction, again, can be seen as a result of cognitive processes, as satisfaction often involves non-instrumental factors as well, such as enjoyment and control (Agarwal and Karahanna, 2000).

In general, little research is made about cognitive absorption in information systems science field, when IT usage is mandatory. This study focused on cognitive absorption under mandated use. Therefore, the existing theories under voluntary information system use was being studied and tested.

5. Data and methodology

This chapter presents the research methodology that was used in this study. It also explains how the data was collected and analyzed, and evaluates the reliability and validity of the data.

5.1 Methodological framework

The methodological framework of this study was qualitative. Motivations to do the study using qualitative framework were several.

Cognitive absorption, which serves as a theoretical framework for this study, has a strong connection to psychological discipline of science. Considering this partly psychological research context, it was important to get descriptive research material to analyze the phenomenon better. Qualitative research material described the topic under examination in more versatile way than what quantitative research would have described. Also the fact that cash flow estimation is yet relatively new topic in information systems field required this study to be conducted from more in-depth point of view and therefore provide detailed results. Detailed answers gave a better understanding for the researcher about the topic that was yet quite unfamiliar.

Theoretical support for these aspects is provided by for instance Denzin and Lincoln (2000), Myers (2009) and Barnham (2010). Citation from Denzin and Lincoln's handbook for instance states that "qualitative investigators think they can get closer to the actor's perspective through detailed interviewing and observation" and that "they argue that quantitative researchers are seldom able to capture their subjects' perspectives because they have to rely on more remote, inferential empirical methods and materials" (p. 10). Myers again claims that to understand people's motivations and actions in an in-depth way, qualitative research is the best option. Lastly, because of the psychological nature of this research, it is good to note that according to common knowledge qualitative theory is originated from modern psychology (Barnham, 2010). Therefore, it is logical to assume that this method was especially suitable for this context.

The research was conducted through case company interviews. Myers and Avison (2002) define case research as follows: “A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organizations)” (p. 4). According to them case study does not require strict single-way measuring methods and also the variables are more flexible. These qualities assure the more in-depth interpretation of the data. Case study research is the most common qualitative method used in IS (Myers and Avison, 2002).

Case study design can be divided in two different options: A single-case design or multiple-case design. Multiple-case design was chosen to this research. According to Myers and Avison (2002), multiple-case study is the most suitable when the intention of the research is to describe, build theory or test theory. The purpose of this study was to describe the current uses of cash flow estimation systems and to test, if the theory of cognitive absorption by Agarwal and Karahanna (2000) holds in this information systems usage context. Therefore multiple-case study was the most desirable design for this study.

This research was also utilizing method from grounded theory to analyze the transcribed interview data. Grounded theory is a type of qualitative research. In grounded theory, researcher normally attempts to build theories about a social phenomenon and these theories are grounded in for example interviews. Theory grounding is executed by exploiting coding technique, which will be handled more precisely in chapter 5.3. (Bhattacharjee, 2012)

5.2 Research preparation and data collection

The preparation for the research contained visits in three companies, which provided background information to the topic of cash flow estimation in information systems field. First meeting was held with the thesis subscriber and included negotiations about the framing of the research question. Second meeting was held with a software company, which offered solutions for cash flow estimation. The purpose of this meeting was to get a practical idea of cash flow estimation information system by familiarizing with the system in its concrete form. Third meeting was held with a SaaS-company, which offered electronic accounting services, but did not have a

cash flow estimation tool in their product category yet. The purpose of this meeting was to familiarize with a bookkeeping system, which was still missing the forecasting tool. All of the meetings took place in fall 2011. None of the meetings were recorded as the purpose of them was to brainstorm and educate about the phenomenon of interest.

Data of this research was collected through interviews in the case companies and short pre-interview questionnaires that were sent to each interviewee before the interview (Appendix I and II). The data collection of case research can be conducted with multiple different methods such as interviews, observations and prerecorded documents (Bhattacharjee, 2012). Above described methods are common for case study.

According to Eriksson and Kovalainen (2008), there are three types of qualitative interviews: (1) Structured and standardized, (2) guided and semi-structured and (3) unstructured and informal. The type of interview in this research was closest to structured and standardized interview. In structured and standardized interviews the interviewer follows a preplanned script and there is little flexibility with the discussion, but instead the discussion is before structured, only the answers of the interviewee are open ended.

In case of this research, a document with the interview questions was prepared before the interview and it was sent to each interviewee in advance. In order to understand the profile of the company and the current cash flow estimation knowledge, also a background information pre-questionnaire was sent to the interviewees before the actual interview. There were total seven interviews, of which one company was not a case company studied, but a private equity financing company that was at the moment financing all the case companies. Private equity financing company was interviewed in the means to set up a benchmark for ideal way of implementing cash flow estimation and therefore, to provide interesting basis for analyzing the other answers. For that reason, the questions for this person were different from the case company interviews (Appendix III).

All the interviews were held in Finnish, recorded and transcribed. Transcriptions are confidential and therefore not attached. The citations in the chapter 6 are translated

from Finnish to English. One interview had to be cancelled because the interviewee was reluctant to answer the questions. Information about the interviewees and the interviews can be found from table 4.

Table 4. Interview information

| Company name | Interviewee/ Abbreviation | Date of the interview | Duration of the interview | Interview type |
|------------------------------------|---------------------------|-----------------------|---------------------------|----------------|
| Company A | CFO 1 | 22.11.2011 | 00:51:58 | Face to face |
| Company B | CFO 2 | 23.11.2011 | 00:41:03 | Face to face |
| Company C | CFO 3 | 25.11.2011 | 00:50:39 | Face to face |
| Company D | CFO 4 | 29.11.2011 | 00:44:45 | Face to face |
| Company E | CFO 5 | 29.11.2011 | 00:59:23 | Face to face |
| Company F | CEO 1 | 30.11.2011 | 00:57:09 | Phone call |
| Venture capital investment company | VC CEO | 24.11.2011 | 00:55:42 | Face to face |

Standardized interviews are being criticized because of their restrictive and unnatural form (Eriksson and Kovalainen, 2008). However, in this research it was important to be able to collect information about facts and be able to go through all the questions in a limited time. Under these circumstances structured interviews can be considered a good option (Eriksson and Kovalainen, 2008).

5.3. Qualitative data analysis

According to Alasuutari (2011), the way that the observations and findings are brought together can be called the actual qualitative analysis. Alasuutari writes that the idea is to shape such rules that hold with the entire data. Therefore, exceptions are crucially important, as they show inapplicability of these general rules. Therefore, qualitative analysis and the rules that the analysis is based on has to be absolute.

5.3.1 Qualitative comparative analysis

Alasuutari represents a method that can be adapted to certain qualitative analysis, and which has been developed by Charles Ragin (1989). This Qualitative Comparative Analysis (QCA) method uses Boolean algebra for the analysis of

similarities and differences across cases, to investigate under which conditions a certain state of affairs exists (Rantala and Hellström, 2001).

Ragin's method has been applied partly in this research to easier compare the appearance of the dimensions of cognitive absorption among the interviewees. Only for the questions and answers regarding this topic Ragin's method was possible to apply, since the data had to be presented in binary categories so that the answers were either yes (1) or no (0). The table which presents the data is called truth table. Truth table of the cognitive absorption dimension is presented in chapter 6.4.1.

Normally the QCA analysis condenses the information presented in the table by using Boolean algebra performed by the computer. The process results in an equation, which indicates the possible combinations of conditions resulting in the same outcome. (Rantala and Hellström, 2001) In this research, QCA analysis was adapted on very simple level, but it offered enough structured system to analyze the appearance of cognitive absorption dimensions.

5.3.2 Coding

The other half of the interview questions handled current practices and details in case company's cash flow estimation process and the other half handled emotions and habits regarding the usage of information systems, specifically Excel. The answers to these questions were descriptive and therefore, no binary truth table could be formed. To analyze rest of the answers coding technique was adapted.

Coding is "a process of classifying and categorizing text data segments into concepts or 'codes', which can then be used to uncover patterns in the data" (Bhattacharjee, 2012, p. 113). Coding consists of coding units (e.g. a sentence), concept (e.g. description of current cash flow estimation process) and category (e.g. cash flow estimation systems). Bhattacharjee writes that coding is widely used especially in grounded theory research, i.e. developing a grounded theory, but can be used within other research contexts as well. In this research context the focus was not to build a new theory, but more to test the existing one by possibly expanding it.

According to Bhattacharjee (2012), Strauss and Corbin (1998) present three coding techniques: (1) open coding, (2) axial coding and (3) selective coding. Flick (2009) writes that these procedures are different ways of handling textual material, but should not be seen as distinguished procedures or separated phases, as the researcher combines these procedures.

During first step, open coding, the researcher actively seeks new concepts which are hidden within the text (here transcribed interviews) and are relevant to the research question. These concepts are then grouped into higher order categories. (Bhattacharjee, 2012) During the second step, axial coding, the researcher elaborates the relations between categories. Here the focus is to clarify which concepts are phenomenon in its category, a condition for other categories or a consequence for a third group of categories (Flick, 2009). Coding paradigm model, which demonstrated axial coding, is presented in figure 7.

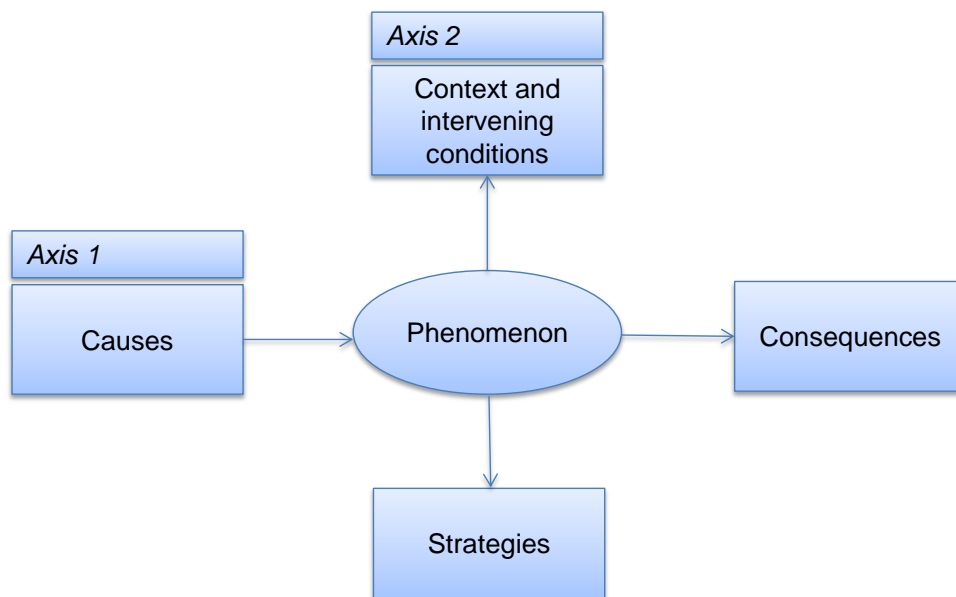


Figure 7. The paradigm model (modified from Flick, 2009)

Last step is called selective coding. In this step, the researcher finds the core concepts, core variables and relevant categories. In other words, selective coding results in as the “story of the case”, as Flick describes. According to him, “the result should be one central category and one central phenomenon” (p. 312). In this research, the core concepts and core categories were organized in theme clouds. Because of the limited size of the sample data, not all concepts could be organized

to higher categories. However, if the concept was considered critical to the research result it was included in the theme cloud. Font size demonstrates the frequency of certain issues emerged.

5.4 The reliability and validity of data

Since qualitative research is interpretive and subjective, it is often seen as less reliable or rigorous than quantitative research. According to Bhattacharjee (2012) some researchers claim that in qualitative research context reliability and validity cannot be measured the similar manner as quantitative. Alternative set of criteria could be (1) dependability, (2) credibility or “internal validity”, (3) confirmability and (4) transferability or “external validity”. Table 5 explains the special conditions for these criteria.

Table 5. Reliability and validity criteria

| Alternative set of reliability and validity criteria in qualitative research | |
|---|--|
| Criterion | Condition |
| 1. Dependability | Two researchers using same data comes to the same conclusion |
| 2. Credibility/”Internal validity” | Readers find the results credible |
| 3. Confirmability | Participants confirm the findings |
| 4. Transferability/”External validity” | Findings can be generalized to other settings |

In this research, the recorded and transcribed interviews support the credibility and therefore, the reliability and validity of findings. Also, carefully described data analysis increases credibility. In addition, to provide versatile data, the interviewees filled a pre-questionnaire before the actual interview, which gives another dimension to the study.

Limitations of the study can arise e.g. from small sample size, using only one technique to gather the data or selection procedures (Rossman and Rallis, 2012). In this study, the limitations arise from small sample size, but also the challenging nature of the coding technique that has been used to analyze the data. Flick (2009)

for example writes that the challenge with coding technique is its abstract nature and the potential endlessness.

6. Results and discussion

Results and discussion has been divided in four parts. First part presents the background information of the case companies and discusses shortly about the previous experience of interviewees in cash forecasting information systems. Second part summarizes the main points from the interview with the venture capitalist to give an insight to the special characteristics of private equity financed company and the cash flow estimation obligations in such company. Third part analyzes cash forecasting in practical level from private equity financed company's point of view. Fourth part analyzes theory and the interviewees' responds to the questions handling cognitive absorption and how cognitive absorption is being experienced, when implementing cash flow estimations.

6.1 Case company profiles

There were total seven interviews in this research, of which six were actual case company interviews. Because all these companies were startups and they were financed by the same venture capital investor, it was important to hear the comments about cash flow estimation from the investor himself as well. Therefore, to provide insight to cash forecasting from VC investor's point of view, one interview was done with the CEO of the venture capital investment company. Subchapter 6.2 analyzes the interview with the private equity investor.

All the interviewees were at the moment persons responsible for executing cash flow estimation in their company. Out of six persons five were chief financial officers and one person was chief executive officer. This company did not have a CFO yet. The average age of the respondents was 40.7 years. Five interviewees were males and one interviewee was a female. All case companies were specialized in innovative technology development and were quite young by age, except for company B, which had been founded already in 1999. The rest of the companies were founded in 2000s. Companies varied in size, which was here measured by the amount of employees and estimated revenue in 2011. Company E was notably bigger than the other companies, whereas Company A and Company F were the smallest.

Table 6 summarizes the background information of the interviewees and the case companies.

Table 6. Case company profiles

| | Company A | Company B | Company C | Company D | Company E | Company F |
|------------------------------------|-----------------------------------|-------------------------|----------------------|----------------------|--------------------------------|------------------------|
| Interviewee | CFO 1 | CFO 2 | CFO 3 | CFO 4 | CFO 5 | CEO 1 |
| Abbreviation | CFO 1 | CFO 2 | CFO 3 | CFO 4 | CFO 5 | CEO 1 |
| Age | 32 | 38 | 35 | 31 | 59 | 49 |
| Gender | Male | Male | Male | Female | Male | Male |
| Core business | Component and material technology | Electronics development | Software development | Software development | Thin film equipment production | Electrical engineering |
| # of employees | ~16 | ~30 | ~45 | ~30 | ~85 | 10 |
| Founded | 2007 | 1999 | 2009 | 2002 | 2005 | 2008 |
| Estimated revenue in 2011 (mil. €) | 0,14 | 10 | 2,8 | 2 | 17 | 0,5 |
| Forecasting person | CFO | CFO | CFO | CFO | CFO | CEO |
| IS in use for forecasting | Excel | Excel | Excel | Excel | Excel | Excel |

Significant for this research was the fact that each company used Excel for cash flow estimation at the moment. The interviewees were asked, if they have ever tried an information system, which is specifically tailored for cash flow estimation. Only two interviewees, CFO 1 from Company A and CEO 1 from Company F had not tried or were not familiar with a forecasting system at all. However, for instance CFO 3 and CFO 4, who were familiar with forecasting IS and to whom this tool had been available, had not been using it for forecasting. The citations below explain why.

“...specifically for that purpose I have not, but our bookkeeping system generates a cash forecast from the sales ledger and purchase ledger ... We have EmCe ... accounting company’s ... a system further licensed for us ... but it’s almost useless for us because it does not take into account ... the ones in purchase invoice processing system and, mmm, travel invoice processing system ... does not include the ones, the invoices still being processed ... it surely gives a wrong idea ...” - CFO

3

"...I have sometimes used SAP and there it has been but, you know, we have not, not utilized it ... it was a very big company ... we were not able to take everything in use at once." - CFO 4

The two other ones, CFO 2 and CFO 5 who actually had used forecasting system at some level explained their experience as follows.

"...there (in Netvisor) it is available ... it did not work ... I had to continue with Excel ... editing ... in different you know time perspective, different scenarios ... very difficult ... it was 2008 ... it was useless ... with Excel it goes so don't bother to put so much money... together we noticed that we could not do it with it ... we were about to change accounting firm ... what either accounting firm could offer or partner could offer ... we have considered SAP and little SAP ... that we would integrate with production and others" – CFO 2

"To be honest I have not ... Sometimes in my previous life ... looked a little bit something ... I don't remember it's been so long time ago ... probably some Excel-based ..." – CFO 5

As a conclusion, out of six interviewees four had some experience of cash flow estimation information system, although, only two of them had actually used forecasting tool. CFO 4, for instance, who was familiar with forecasting tool, explained that SAP, an ERP system, which had cash forecasting functionality, had been in use, but not the cash forecasting function of it. Also Company C had, at the moment, an accounting system called EmCe in use, but CFO 3 said that it was useless for them in cash forecasting sense.

Besides SAP and EmCe the other forecasting programs that were mentioned were Netvisor and Excel. CFO 2 explained that in 2008 Netvisor, a SaaS-based, electronic accounting service had been given a try but it had not worked. The uselessness had been talked with the service provider, who had acknowledged the problems and therefore, with mutual understanding, the service had been let go.

As it will be seen in chapter 6.3 each interviewee showed strong interest in cash flow

estimation and were willing to improve their own forecasting process by possibly acquiring an actual forecasting system. Good ideas about the functionalities were also discussed and this is very valuable information for the system developers.

Next subchapter provides venture capital investor's insight to cash flow estimation.

6.2 Venture capital aspect to cash flow estimation

As CFO 3 mentioned in his interview, it is important to notice that private equity financed companies have special characteristics, which affect the financial aspect of the company. Citing him

“If a person who does not know that this research focuses on private equity financed companies reads this research, one will get relatively wrong idea ...”

Therefore, an interview with the VC investor was arranged. For the same reason, it was considered a good idea to include an own section in this thesis about the special characteristics of private equity financed companies. Very little amount of literature was found about private equity financed companies together with cash flow estimation. Thus, the best idea was to collect the material via empirical interview.

Adapted from the coding technique, which was presented earlier in chapter 5.3.2 the interview answers were organized under different contexts. Venture capital investor's interview consists of 23 contexts. The interview itself held 24 questions (Q1-Q24), but some of the questions were organized under the same context as they handled the same topic (e.g. question 16: “Are you satisfied with Excel?” and question 17: “Why?” were organized under the same context: “Personal satisfaction level in Excel forecasting”). The interview plots with contexts can be found from appendices (Appendix II – Case company interview questions and Appendix III – Venture capital investment company interview questions).

6.2.1 Venture capital investment company's profile

The venture capital investment company of this research was founded in 2005. At the interview moment, this company functioned in Helsinki and Shanghai. The interviewee, VC CEO had been working in the field for 15 years already and therefore, had a strong understanding about the topic. VC CEO was also the one who recommended the case companies for this research from the portfolio, based on his understanding about which companies would be suitable for this research context by their size and stage.

VC CEO explained that the company's investment focus is in early-stage technology companies, in other words, early-stage venture capital. By pure risk investment the investors' target is to transform these Finnish startups into category leaders within some specific segment. According to VC CEO, it will take at least 3-6 years for their portfolio companies to establish globally significant market position. The most important mission of the venture capital is to control and manage the fund through which the portfolio companies are being invested in and to increase the value of the companies.

6.2.2 The purpose of cash flow estimation in private equity financed companies

Venture capital investor requires cash forecasting from their investment targets. The obligations that the portfolio companies have for the VC investor are more specifically defined in the partnership agreement and partly in the corporation law. According to VC CEO, the portfolio companies deliver sales forecasts both quantitatively and qualitatively, income statement, cash forecast and sometimes balance sheet on monthly basis to the VC investor. Costs and cost budget are also carefully observed as early-stage companies, which normally don't have revenue yet, have to control their costs and expenses.

Cash flow is being evaluated by the current and future state. The most significant cash inflows from venture capitalist's point of view in private equity financed companies are besides the ones that come from the actual business but also the

ones that come from the investors and other funding sources. The VC needs to see all the time that there is sufficient amount of cash and how the cash flow has been estimated. This helps the VC to optimize the sufficiency of cash flow in 6-12 months period, said VC CEO. At the same time cash flow estimation works as a prioritization tool for the VC, meaning that it gives information about where to allocate the investments. Sometimes VC might also enroll in cash flow estimation, spar and give guidelines to better forecasts, but VC CEO stressed that this is very temporary and exceptional situation.

According to VC CEO, the most important function of cash flow estimation in private equity financed companies is to predict the sufficiency of cash and to help notice when the startup is running out of cash. The concepts “*sufficiency of cash*” and “*running out of cash*” came up within four different contexts: Context 8 - Obligations set by investor to the portfolio companies (Q8), Context 9 - Most important function of cash flow estimation (Q9), Context 12 - Consciousness of portfolio companies about the importance of cash flow estimation (Q12) and Context 23 - Ideas for cash forecasting system developers (open discussion). “*Avoiding the surprises*” was also mentioned within two different contexts: Context 9 - Most important function of cash flow estimation (Q9) and Context 10 - Most important function of cash flow estimation from VC’s point of view (Q10). Adequacy of cash, which can be defined as the main category for these three expressions, can therefore be seen as the most critical function of cash forecasting in private equity financed companies from VC’s point of view.

In the case company interviews interviewees mentioned concepts like “*ensuring adequate cash reserves*”, “*ensuring continuous liquidity*”, “*giving time to management and board*”, “*managing cash reserves globally*”, “*noticing financial needs in time*”, “*planning of liquidity*”, “*ensuring adequate funding*”, “*facilitating funding negotiations*” and “*securing financial position in advance*”. From these concepts Time, Liquidity and Funding can be separated as main categories.

Within three different contexts VC CEO highlighted that the forecasts should be done for the next 6-12 months. The contexts were: Context 8 - Obligations set by investor to the portfolio companies (Q8), Context 9 - Most important function of cash flow

estimation (Q9) and Context 11 - Most important time horizon of forecasts (Q11). In chapter 2.3 cash forecasting was divided in three different time horizons by De Caux (2005). Based on De Caux's categorization 6-12 months can be defined as medium-term forecasting.

When case companies were asked about the obligations that the venture capital investor has set for them regarding cash flow estimation (Context 10 – VC's expectations about forecasting (Q12)), concepts like “cash flow estimation”, “predicting financial needs”, “monthly cash flow estimation”, “cash position”, “financial position”, “new funding”, “cash flow calculation” and “running out of cash” were most commonly mentioned. These concepts can be further divided in three categories – Cash position, Cash forecasting and Financial needs. Other single concepts that were mentioned were “in time”, “rolling 12 months”, “risk factors”, “income statement”, “balance sheet”, “allocation of investments”, “reports to the board”, “accuracy” and “reliability”.

Figure 8 illustrates the single concepts and three upper categories that emerged regarding VC's expectations about cash flow estimation.

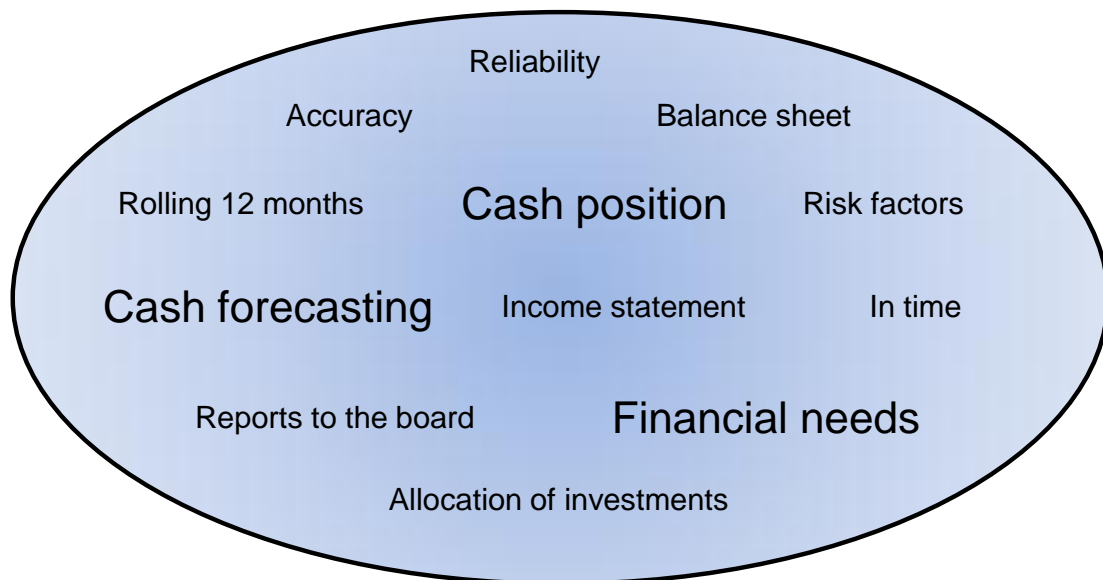


Figure 8. Venture capital investor's cash flow estimation expectations according to the portfolio companies

Although financial needs emerged more than once in the interviews, CFO 3 explained that

“...based on my experience in our case it is not nearly as interesting, sort of, where the financing comes ... it seems to be more interesting what kind of receivables we have from the customers ... if we have prolonged, expired receivables then those are the ones they (investors) might look at ...”

In addition CFO 2 from Company B explained that

“...our own needs are that much strict that with those ... we also cover the needs of private equity investors ...”

Only CFO 5 from Company E answered as follows.

“I don't think that they have anything special... peculiar (expectations). So pretty much it is like created by us, that reporting format ... So I would say that no, not in our case.”

6.2.3 Problems with cash flow estimation in private equity financed companies

According to VC CEO, the portfolio companies do not acknowledge the importance of cash flow estimation. He said that one always has to teach the importance of forecasting to the companies and maybe after 1-2 years of cooperation they acknowledge it. Citing the VC CEO, the reason why the companies do not acknowledge the importance is because

“...they maybe have overoptimistic expectations and they state that if there is this much money now then why should we bother to forecast ...”

According to VC CEO, only third of the portfolio companies implements forecasting successfully. The main reason for this is experience and cooperation with the VC. The reason why the companies fail in forecasting is the young age, unestablished forecasting processes and lack of good tools and knowledge. The failure can be seen in e.g. figures that are unrealistic, allocation unclarities, realization of holiday salaries and the external funding recognitions.

VC CEO saw that with the help of a real forecasting system important details would be looked through more carefully. He explained that

“... the most typical cash flow difficulties, challenges that there are meaning debts, VATs, allocations ... sales receivables, the collection of sales receivables, then they would be looked through because CEO very often tells now there has been ... deals worth millions, but they don't tell how much it has tied up costs ... and when does it accumulate cash flow.”

6.2.4 Excel-based forecasting versus other forecasting

Based on the interview with the Venture capital investment company, there are few reasons why companies are mainly using Excel for forecasts:

- 1) Lack of knowledge about the systems/Lack of systems available
- 2) Outsourced bookkeeping/Lack of systems available
- 3) Own sales forecasting tools
- 4) Bookkeeping material integration difficulties with forecasts

Because of the fact that all of the case companies in this research currently were using Excel as their forecasting tool, VC CEO was asked if he was satisfied with the current way of forecasting with Excel. The cited answer was

“Yeah, I mean if it is done carefully then yes it's enough for our purposes, but it takes quite a bit of work then. I would prefer to see it as online- or browser-based and you could kind of a bit simulate it, see graphs, adequacy of cash, different scenarios ...”

VC CEO mentioned the concept “browser based” within two different contexts, Context 16 – Personal satisfaction level in Excel forecasting and Context 19 – Technical wishes towards forecasting system. This can be seen as the most desired technical feature of the estimation system and it refers to the increasing popularity of SaaS-based programs which was discussed earlier in chapter 3.2.

According to VC CEO an ideal cash flow estimation system for a private equity financed, startup company would have a special focus on forecasting the balance

sheet, in other words the equity, liabilities and other financial contributions under it. Namely, it is the capital structure that the VC is interested in, meaning revenue, expenses, investments, receivables, liabilities and private equity. According to VC CEO, a useful forecasting time horizon for balance sheet could be 36 months.

Interestingly CFO 3 specifically mentioned that he thinks that with private equity financed companies

“...these kind of traditional funding questions like the structure of balance sheet are almost indifferent compared to the cash flow estimation.”

In other words, it seems that to some extent the focus of interest about forecasting seems to differ between the investor and the company. The reason could be that Company C where CFO 3 was working at the moment was the youngest company of the case companies. Therefore, as it was discussed with VC CEO, for young companies the focus is strongly in cash forecasting and cost forecasting. Actually VC CEO suggested that companies that are in different stage should have a possibility to utilize different kind of forecasting systems. For young companies the forecast should focus on costs, for mid-stage companies the focus should be on income statement and for mature companies forecast should provide the whole financial management.

The easiest way to launch such system, according to VC CEO, would be through the board. Most difficult part of launching such system would be the accuracy of information, the integration and the forecasting itself. If revenue and profit can be forecasted accurately, the forecast would be useful.

When VC CEO was asked if he thought that the companies would take a forecasting system in use he answered

“I think so ... because I think there is an immediate need ... any tool that is reasonably priced and fast to take-into-use will improve it (forecasting)”.

Next chapter will analyze the case company interview answers regarding cash flow estimation in practice.

6.3 Case company aspect to cash flow estimation

Because neither one of the interviewees had an actual forecasting information system in use, but everyone were utilizing Excel for forecasting, it was useful from possible system developers point of view to gather information about the current forecasting processes and interviewees' opinions about an optimal forecasting system. This chapter gives a practical approach to the research topic.

6.3.1 Current cash flow estimation process

The interviewees were asked to describe their current cash flow estimation process step by step to understand the different ways that Excel can be utilized in this context (Context 3 – Description of the forecasting process (Q3)). All of the interviewees were executing their forecasting process manually at the moment. Only in Company F cash flow estimation file was linked to the accounting system, from which the Excel template took automatically the purchase invoice information of the company. However, the purchases that had not been forwarded to the accounting system yet had to be inserted to the forecasting file manually.

Except for Company F's automated purchase invoice plug-in, case companies' cash flow estimation was purely based on manual work. Manual work included operations like copying from system to another (e.g. bookkeeping system, Internet bank), collection of data (in some cases globally), consolidating data of parent and affiliates and calculating catastrophe scenarios.

Elements of the manual forecasting that interviewees mentioned were investments, loans, equity, sales, sales margin, sales invoices, purchases, costs, travelling expenses, purchases in process, sales receivables and work-in-progress. Fixed costs, like salaries and rents were also mentioned in three interviews, but more because they were part of the forecast, yet not the ones being forecasted. Purchases and sales were most commonly brought up. However, Company A and Company F, which were both founded between 2007 and 2008 did not have significantly sales or revenue yet (Table 6. Case company profiles).

CFO 1 explained that

“...we have to communicate to the investors somehow that ... although we don't have sales at the moment this company has huge potential ...”

Therefore cash flow estimation was purely investor driven function in some of the companies. For this same reason the forecasting horizon in e.g. Company A's case was absurd long, 5 years.

The table below presents the forecasting horizon, forecasting cycle, time usage and forecasting frequency of the case companies.

Table 7. Details about the current cash flow estimation processes

| Case Company | Forecasting horizon | Cycle | Time spent per forecast | Forecasting frequency |
|---------------------|----------------------------|--------------|--------------------------------|------------------------------|
| Company A | 60 months | 1 month | 1 day | 1 x month |
| Company B | 3 months | 1 week | 90 min | 2 x month |
| Company C | 3 months | 1 week | 180 min | 2-3 x month |
| Company D | 12 months | 1 week | 30 min | 1 x week |
| Company E | 12-18 months | 1 month | 60-120 min | 1 x month |
| Company F | 36 months | 1 month | 30 min | 1 x month |

Also from this table can be seen that Company A and Company F were the youngest companies in this research as their forecasting horizon was significantly above the average forecasting horizon. This indicates that young companies, with low or no revenue at all, have to provide more detailed, long-run cash flow estimations because of the financial matters.

The forecasting process varied between the interviewees. Most common forecasting frequency was once or twice in a month. Only one interviewee (CFO4) explained that she made cash flow estimation weekly. However, she used the verb *“update”* which can be interpreted different from making an entire forecast. CFO 5 also used the verb *“updating”* although he was talking about making an entire forecast. He explained that

“...I have that template, it is always simply updating ...”

The terminology and the meaning between “*updating*” and “*forecasting*” can be confusing.

CFO 2 from Company B explained that they have three different kinds of forecasts: A 12 week forecast, a 12 month forecast and a 2-3 year target. However, their focus was in short-term forecasting, which was for that reason chosen in Table 7. Also CFO 1 explained that he has separate file for daily updates, but the cash flow estimation he showed in the interview was the long-term, 60 month estimation presented in table 7.

In addition to the updates and actual forecasting, two out of six interviewees mentioned that they use Internet bank on daily basis. CFO 3 explained

“...on daily basis I always check the balance of the bank account ... let’s put it this way, from there I see much faster if a certain invoice has been paid than from our bookkeeping which easily has multiple day delays.”

6.3.2 Accuracy of cash flow estimation

Each case company was asked whether the estimations they manually made were accurate, which were the factors that cause the most inaccuracies and what did it cause. Because the case companies’ profiles were all different considering the type of business, size and stage in their lifecycle, it was not surprising that the answers varied. Only one respondent could not directly name any inaccuracies. Instead he told that

“...especially in 2008-2009 we found it quite working indeed. In other words, we saw early enough when there were problems and managed to react ...”

CFO 3 had only been working with the current forecasting file for couple of months so he did not have experience of the inaccuracies. Despite this, he also named few issues that he saw that would cause inaccuracies.

In addition to the interview question about inaccuracies the interviewees answered to a pre-questionnaire before the actual interview, in which they shortly explained in written what was the most challenging part in cash flow estimation. Mainly the

inaccuracies and challenges were the same, but some different concepts were mentioned in the pre-questionnaire.

The theme cloud in figure 9 illustrates all the emerged single concepts and further developed categories regarding inaccuracies in cash flow estimation.

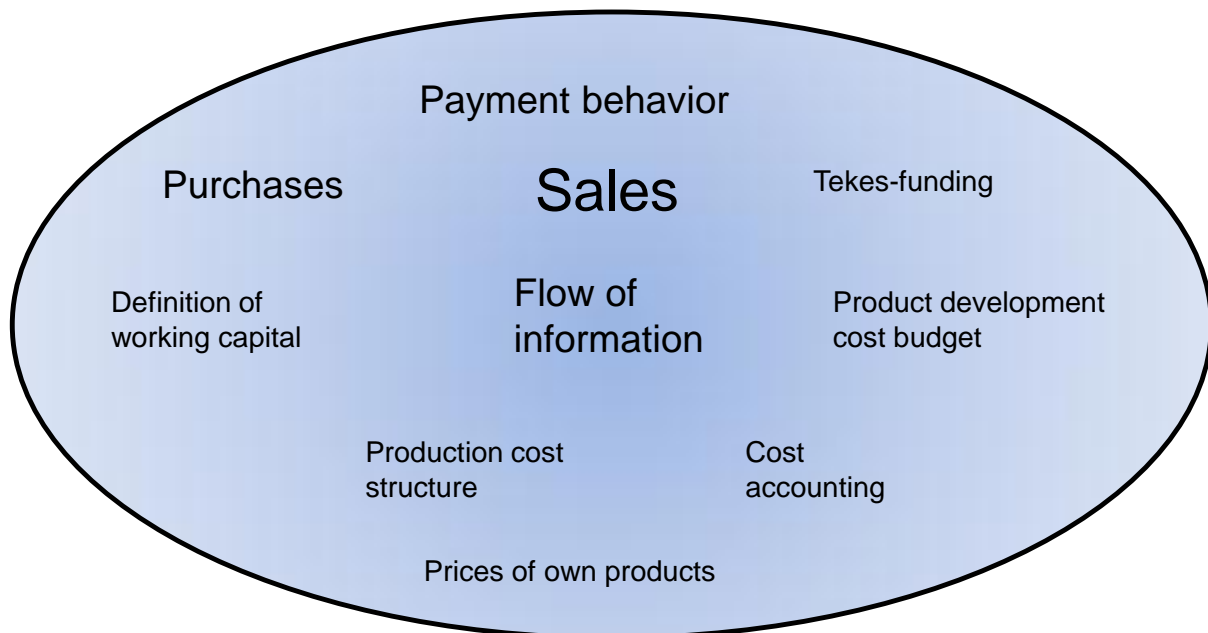


Figure 9. Inaccuracies and challenges in cash flow estimation

Although every interviewee had different experience about the inaccuracies and challenges, there were certain concepts that reoccurred. These concepts were further divided in three categories which can be seen from figure 9. These three categories were Sales, Purchases, Customer payment behavior and Flow of information.

Sales held under such concepts like sales forecasting, sales forecast, project receivables, large invoices, changes in sales and timely distribution of sales volume. All the interviewees mentioned sales as one source of inaccuracies and CEO 1 stated that

“...this will probably not be a surprise for the researcher herself either!”

Other common causes of inaccuracies were payment behavior, purchases and the flow of information. Interestingly both of the consolidated corporations of this research, Company C and Company D, mentioned flow of information as a challenge in their cash flow estimation. Purchases were easy to forecast for most of the companies, but e.g. Company A and Company D admitted that the realization of product development costs and costs from outsourced services might be difficult to forecast. About payment behavior CEO 1 from Company F said that

“...forecasting the payment behavior of the customer is still quite a mystery for us because we acquire new customers all the time and we don't have like a feeling of information security about that other than that Italians always pay 100 days late ...”

CEO 1's comment proves how much the stage of a company affects cash flow estimation. Some of the other concepts in the theme cloud proves this as well, for instance prices of own products and cost accounting, which were difficult to forecast for Company A.

When the interviewees were asked what kind of causes do the inaccuracies result in, the most common answer related to private equity investors. CFO 1 explained that

“...affects to the fact that ... arranging a new funding round requires pretty remarkable inputs so that it ties almost two persons full-time and for six months ... it slows down all the other business pretty significantly.”

CEO 1 told that

“...it causes unnecessary explanations ... it adds all this kind of additional work which does not like add the value of the product ... and then the flexibility is retrieved from the supplier field and that of course weakens the business relations ...”

CFO 5 on his behalf explained that

“Brings more additional work and ... if we sort of like are driven to take more private equity than what we have thought in the beginning then also all the owners' own shares dilute...”

6.3.3 Optimal cash flow estimation system

To find out which characters would help the companies to implement cash flow estimation and decrease the inaccuracies and challenges last subchapter before the actual theory analysis will focus on the system preferences of the interviewees.

Questions relating to this topic were organized under Context 13 – Ideal forecasting system – features and qualities and Context 14 – Most important quality in cash forecasting system. Concepts like *“light and modular ERP”*, *“integrable”*, *“updates figures by itself”*, *“one system”*, *“linked to our current accounting system”*, *“accounts receivable, accounts payable would come automatically”*, *“adapt different scenarios”*, *“insert a default value per customer”*, *“one system”*, *“in synch with the actual bookkeeping system”*, *“group level”*, *“a module”*, *“extensive”*, *“communicates with the bookkeeping”*, *“includes budget”*, *“joint system”*, *“able to adjust”*, *“credible”*, *“sucks data from other systems”*, *“integrated”*, *“project specific cash flow estimation”*, *“graphics”*, *“realized cash flows”*, *“quality”*, *“clear”*, *“forecasting payment behavior”*, *“facts would find there automatically”*, *“credible”* and *“integrated sales”* emerged. Same concepts occurred in the pre-questionnaire.

Based on these concepts these details can be further organized in categories and single concepts that can be seen from figure 10.

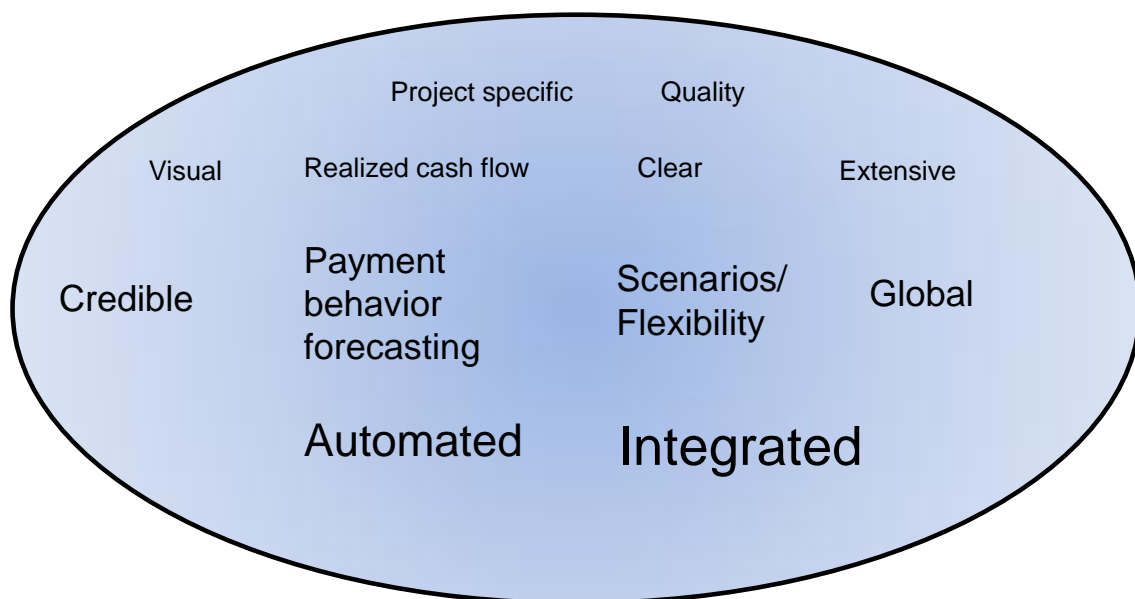


Figure 10. Cash forecasting system quality preferences

Since the most common factor in an ideal cash forecasting system was integration, it was good that one of the questions in the interview handled current accounting information systems in use (Context 11 – Accounting related information systems in use (Q13)). Besides this question, the interviewees explained in chapter 6.1 about their experiences in cash flow estimation information systems.

Table 8 summarizes the accounting information systems in use at the interview moment. Same table expresses the probability of interviewees to take such system in use. In chapter 6.2.4 same question was asked from the private equity investor. Table 8 also shows the preferred system provider, whether the case company would prefer to buy a separate system to their own use, i.e. insourced option, or whether they would buy the service from their accounting company, i.e. outsourced option.

Table 8. Accounting information systems in use

| Case company | Accounting systems in use | Intention to buy cash flow estimation system | Preferred system provider |
|--------------|---|--|---------------------------|
| Company A | e-Toimisto | Would buy | No preference |
| Company B | Netvisor | Would familiarize with | Insourced |
| Company C | EmCe, M2 and eOffice | Would discuss about | Outsourced |
| Company D | eFina | Would probably buy | Outsourced |
| Company E | ProCounter and Lean System | Would consider | Insourced |
| Company F | Outsourced accounting (Festum Accounting) | Would give a try | Outsourced |

For system providers the current accounting systems in use is valuable knowledge, as the most common wish of the interviewees was that the service would be integrated to the existing systems. However, when the case companies were asked how probably they would acquire such system, the answers were uncertain. In chapter 6.2.4 the investor was quite sure that this kind of system would be taken into use. All the case companies expressed careful interest in such system, stressing the significance of additional value and price in their decision making process.

Next chapter will focus in cognitive absorption in cash flow estimation process.

6.4 Cognitive absorption in cash flow estimation

Cognitive absorption related questions formed the other part of the case company interviews. There was also one question about cognitive absorption in the pre-questionnaire. The purpose of this chapter is to analyze if there is a possibility that users could experience cognitive absorption, deep involvement with software, when they are implementing cash flow estimations, and whether cognitive absorption could affect decision making. The information system that is being examined here is Excel, which was at the moment the forecasting system for all the interviewees.

6.4.1 Appearance of cognitive absorption dimensions

As it was discussed in chapter 4, Agarwal and Karahanna (2000) has suggested certain dimensions, which define the appearance of cognitive absorption. These are temporal dissociation, focused immersion, the notion of control, curiosity and heightened enjoyment. The interviewees were asked if they could recognize these qualities in themselves in general or as they are doing cash flow estimations. Respondents did not know that the questions handled cognitive absorption dimensions. Table 9 demonstrates which questions were pointed to each dimension.

Table 9. Contexts and questions about cognitive absorption dimensions

| CA Dimension | Context in the interview | Question/-s in the interview |
|--|--|---|
| 1. Temporal dissociation / 2. Focused immersion | Context 18 – Flow | Q20 Do you lose the track of time and place with work-related IS usage? |
| | | Q21 Why does this happens? |
| | | Q22 Does this happen with some other IS usage? |
| 3. The notion of control | Context 23 – Control | Q30 Is the notion of control important in IS use? |
| 4. Curiosity | Context 24 – Curiosity and learning | Q32 Are you curious to learn? Do you like to learn? |
| 5. Heightened enjoyment | Context 19 – Enjoyment in cash flow estimation and numbers | Q23 Do you like making the forecasts? |
| | | Q24 Do you like numbers? |

As temporal dissociation and focused immersion were both relating to the state of flow, which is one of the theoretical frameworks for cognitive absorption, these two dimensions were combined in the interview.

Based on the answers a truth table was formed. In truth table number 1 presents a positive outcome, meaning in this case that the dimension was recognized, number 0 again presents a negative outcome, meaning in this case that the dimension was not recognized. If the outcome was purely positive then it can be assumed that there was a likely chance for the appearance of cognitive absorption, whereas if the outcome was purely negative it can be assumed that there was not a likely chance that cognitive absorption would appear.

Table 10. Appearance of cognitive absorption dimensions among the interviewees

| Dimension | CFO 1 | CFO 2 | CFO 3 | CFO 4 | CFO 5 | CEO 1 |
|---|-------|-------|-------|-------|-------|-------|
| Temporal dissociation / Focused immersion | 1 | 1 | 1 | 1 | 0 | 1 |
| The notion of control | 1 | 1 | 1 | 1 | 1 | 1 |
| Curiosity | 1 | 1/0 | 1 | 1 | 1 | 1 |
| Heightened enjoyment | 1 | 1 | 1/0 | 1 | 1 | 1/0 |
| Cognitive absorption | 1 | 1/0 | 1/0 | 1 | 1/0 | 1/0 |

It is important to notice that there were two assumption made. One assumption was that if the person responded positively to question 30 about the notion of control, it also applied to cash flow estimation information systems. CFO 5 and CFO 4 specified the feeling of control they had with Excel, but the other interviewees responded generally if the feeling of control with information systems was important to them. The other assumption was that if the person responded positively to question 32, it was assumed that this personality trait of curiousness applied in cash flow estimation as well.

Based on the answers, only CFO 1 and CFO 4 recognized the dimensions clearly. CFO 2, CFO 3 and CEO 1 recognized most of the dimensions clearly, but with each interviewee one dimension was unclear. For those persons whose answers were both positive and negative at the same time the outcome has been marked 1/0 as

the result was not clear. For instance, when CFO 3 and CEO 1 were asked if they like numbers and implementing the forecasts, CFO 3 responded that he likes making the forecasts with Excel, but that he did not like numbers, therefore the process of implementing cash flows could not be interpreted as completely enjoyable action. However CFO 3 mentioned that

“...the usage of the system might not be the pleasure itself but the outcome of it, in other words I don't sort of... I don't specifically Excel or I mean of Excel, so I don't enjoy of the Excel itself but the things that I can make with it ... so in a way the functionality or the benefit that you can get to yourself with that system, then that benefit can be in some cases maybe enjoyable ...”

CEO 1 on his behalf answered that

“Well I would not quite say now that it would be the nicest job ... I am not a passionate number cruncher but when one gets the structure working that the Excel-monster produces the right kind of data then those are quite pleasant to make, but the take in use is not the funniest but the result is pretty good ... maybe I like numbers more than normal people but it is not a passion for me ...”

Also CFO 2 admitted that he is a curious person and likes to learn, but then he also mentioned that

“Yeah in that sense I am yeah but I don't honestly look for them that I should all the time find something new or if I hear about something that I would absolutely want to find out ...”

Temporal dissociation and focused immersion, which relates to the state of flow, arouse interesting comments about the reasons to experience it. CFO 1 explained that he had worked with a forecasting template one Saturday from 9 am to midnight and he had turned off the cell phone to not get bothered. CEO 5 told that he had almost missed a theater show because of that. CFO explained that

“...Especially when one develops something like interesting thing ... after it has become a routine it is like grinding, but when you develop the forecasting model and

you think and creativeness and Excel-formulas ... when creativeness to the system then that is the kind of but I mean it is also intellectually challenging.”

This same theme appeared with everyone else, who had experienced state of flow. Also the need to focus or finish a certain template was brought up to explain the deep attention and concentration.

CFO 5 did not think he lost the sense of time, when he implemented cash flow estimations. He explained that

“...maybe so much experience here, life experience that ... I mean I do recognize that maybe sometimes that has happened but it is like very rare to me ... it is probably because of my personality ... I think that I control the situation like so that ... it is just a tool there for me ...”

Similar to all the interviewees was that flow was not experienced on free-time, which is congruent with Pilke's (2004) finding. According to that, flow is experienced most often with work-related tasks. CFO 3 said he had experienced flow on free-time as well, but he was talking about the work-related information systems that he had been studying at home in the evenings. Interestingly, CFO 3, CFO 4 and CEO 1 mentioned that they used Excel on free-time as well for their own financial budgeting purposes, yet then they did not lose the track of time.

The state of control was experienced important by all the interviewees and also Excel was mostly perceived as manageable system, except for CFO 5, who explained that unfortunately it is not always the case, because information systems in general can be a little difficult. However, most of the interviewees, including CFO 5, had mentioned earlier in the interview that the current situation with Excel is under control and Excel is easy to modify.

As a conclusion, based on the truth table, an absolute outcome cannot be made. Some of the interviewees clearly were more prone to cognitive absorption, whereas the other interviewees were not. This refers to the same finding that e.g. Tellegen and Atkinson (1974), Nadon et al. (1991) and Agarwal and Karahanna (2000) made in their research. Some people are more likely to have absorption as a personality trait than others. Among these people, the qualities that could strengthen the feeling

of cognitive absorption could work as a motivation to begin and continue the system usage.

In the end, it is also important to notice that this research handled a work-related, so called utilitarian information system usage. Thus, the truth table about the cognitive absorption dimensions provides different kind of results, as the previous research that was presented in chapter 4. Namely, most of the earlier research has been conducted under voluntary information system usage only. Therefore, from researcher's point of view, it was somewhat surprising that interviewees recognized flow, deep involvement and enjoyment with as rational information system as Excel and with as rational function as cash flow estimation.

Next sub-chapter analyzes the interviewees' perception about cognitive absorption in information system related decision making.

6.4.2 Perceptions about cognitive absorption in decision making

To study the appearance of cognitive absorption from as many aspects as possible, the interviewees were presented a straightforward question about the decision making and cognitive absorption in information systems field. The question did not include term cognitive absorption, because it was presumable that the term was not familiar to anyone. The question was asked in pre-questionnaire and in the actual interview.

The question was formed to ask whether the interviewees thought that *“other than usefulness-based motivation factors could have an influence in forecasting system usage (e.g. if the system would have specific qualities which would make the usage more comfortable, could the reason for usage be simply the pleasantness or fine technical qualities)”*. Usefulness-based motivation factors here referred to rational, utilitarian and instrumental factors that were described in chapter 4.

Based on the answers in the pre-questionnaire and interviews, the coding technique was applied to find the emerging concepts and categories from the interview data. There were two main categories. The other category was positive, under which the attitude towards cognitive absorption could be interpreted as positive and the other category was negative, under which the attitude towards cognitive absorption could

be interpreted as negative. On the left side of the theme cloud are the concepts that emerged under negative context and on the right side are the concepts that emerged under positive context.

The concepts and categories can be seen from figure 11.

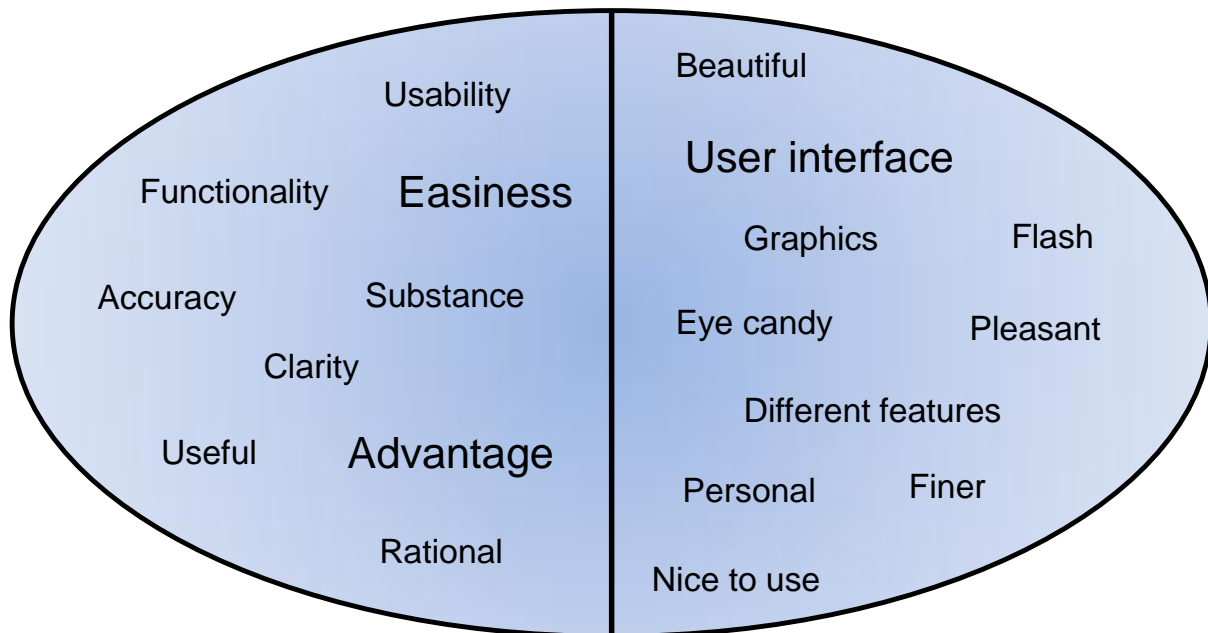


Figure 11. Concepts for and against cognitive absorption

Most common concepts on the negative side that explained the unlikeliness of cognitive absorption were easiness and advantage that users told they have to get from the system usage. Most of the concepts on the positive side handled mostly visuality, but other concepts also occurred, e.g. how one's personality traits affect the perception of cognitive absorption. User interface was mentioned twice. The characteristics of these concepts are much alike the ones that were described in the theories in chapter 4. There can be seen a clear line between the rational and irrational factors. Based on the theme cloud, also the interviewees could recognize the factors that could possibly increase user's deep attention in software and mutually those that would increase the rational motivation to use the software.

Although not everyone had a positive attitude towards cognitive absorption, most of the interviewees acknowledged it and the significance of non-rational factors at least at some level. However, one interviewee did not acknowledge the possibility at all

and three interviewees could see it “in theory”, but in practice they were hesitating. CFO 3 for instance explained that

“...let’s say that in theory I understand that for example ... let’s say if there are for example two systems from which the other one is bloody ugly and bloody good and the other one is good and in addition beautiful and expensive then somebody could want it because of okay, there is like really cool thing in this or this works like Macintosh or in some Macs and that’s the reason why I have Mac and because of that I am a cool dude then I understand it, but I don’t recognize it in me at all. I would take the one that is the most useful and the easiest.”

Only two interviewees answered directly that they believed that also non-usefulness-based motivation factors can have an influence. CFO 1, who was the other one of these persons, explained that

“I truly believe that those reasons that affect human being’s decision making whether it is in work-related issues or any other issues then... then, they are never completely utilitarian ...”

CEO 1 again told that

“I do think that it could have something that let’s say if there is something that can break these sort of attitudes or negative attitudes toward system usage like for example in this company of ours not everyone here want to use that enterprise resource planning system and for some it is, system usage is very unpleasant ... so if it would have something like different features which makes it somehow pleasant then why not ...”

What was noticeable with the answers was that half of the interviewees saw non-useful and useful factors as mutually exclusive. These interviewees explained that in practice not only non-useful factors would result in positive decision making, that also useful-based factors should exist. Agarwal and Karahanna (2000) specifically focus on the comprehensive user experience without ignoring the instrumentality of the information system. In practice this means that non-instrumental factors might be the trigger, which results in deep involvement and then instrumental factors, such as usability and concrete value follows. CFO 4 for instance explained that

“...if I would have two systems where I would choose from and I would experience that the other would be such, nice to use then no doubt I would then pick the one that is nice to use but so that it needs to have the same use as the other one.”

This same comparison between two systems was done by three interviewees, CFO 3, CFO 4 and CFO 5. The same interviewees were the ones who could understand the possibility for cognitive absorption in theory, but not in practice. This connection refers to the situation where these persons have difficulties to understand the coexistence of irrational and rational features. This might be a result from certain personality traits.

Personal ideas and way to perceive certain things could also be noticed with CFO 5, who could not understand that the definition of non-utilitarian would hold under such things as visuality, because from his point of view visuality was utilitarian. However, according to theory, for example Liao et al. (2011), aesthetic characters are defined as irrational. The answers of the interviewees were therefore strongly influenced by interviewee's personal way of interpreting things.

The reflection of this straightforward question and the questions about cognitive absorption dimensions shows that although most interviewees recognized cognitive absorption dimensions, which were all irrational factors, when they were asked directly about the possibility of the appearance of these irrational factors in decision making, most of them were hesitating. This could be a result of general human character which wants to be as rational as possible, especially in this case when the interviewees were in a job position that is considered highly rational.

6.4.3 Relevance of emotions and other motivation factors in continual system usage

The meaning of cognitive factors in initial and continual information system usage was discussed in chapter 4. Beaudry and Pinsonneault (2010) for example found that excitement, happiness and anger were positively related to initial IT use. Ortiz de Guinea and Markus (2009) again found support for the influence of emotions in continual system usage. Liao et al (2011) stated that continual usage can also be influenced by habit and routines.

To find if cash flow estimation and specifically Excel awoke emotions in the interviewees, few questions regarding frustration, perception and anger was asked (Context 21 – Emotions: Frustration, perception and anger (Q26-27, Q31)). Excitement and happiness was examined by asking the interviewees if they ever experienced moments of realizing new functionalities in the cash forecasting system or feelings of success, i.e. perception. Anger was explored by asking if the interviewee ever lost his or her temper with information systems. Question about frustration was presented as simply asking about frustration.

Table 11 illustrates which emotions were recognized among the interviewees.

Table 11. Emerged emotions in system usage

| Interviewee | Frustration | Perception | Anger |
|-------------|-------------|------------|-------|
| CFO 1 | ✓ | ✓ | x |
| CFO 2 | ✓ | ✓ | x |
| CFO 3 | ✓ | ✓ | x |
| CFO 4 | ✓ | ✓ | x |
| CFO 5 | ✓ | ✓ | ✓ |
| CEO 1 | ✓ | ✓ | ✓ |

Based on the results presented in table 11 can be concluded that also work-related, rational information systems awoke emotions and feelings among the interviewees. The appearance of these feelings might provide a reason for the committed use of Excel. The only emotion that most interviewees did not recognize was anger. Interestingly, even those who recognized frustration and perception did not recognize anger. Explanation for this might be that losing temper can come across as very strong expression, which might have an influence to the answers, because a respondent does not want to give a negative image of him or her. CFO 1 explained that the reason why he does not lose his temper is because he knows who to contact

for help. CFO 2 again explained that he does not feel anger, because he has already taken a stand to learning and he has mentally prepared for a difficult process.

CFO 5 described the anger as follows

“...why not, I can recognize that as well, that you know it’s not going with it maybe and, I mean because of if the technology is not working like the case sometimes is, so that suddenly appears some slowness or some weird, unbelievable blue screens all the sudden ... then I boil over a little bit when there is, I mean especially when it’s busy and stress anyways so that the time feels like one has to wait some certain thing then it, I mean yeah, is upsetting but I am not... My general personality is quite calm ...”

Most of the interviewees explained that they did not get many new learning experiences from Excel anymore, but other systems, like enterprise resource planning system and work time registration system, were mentioned. Excel was experienced as well-known system.

CEO 1 explained that

“With Excel I haven’t gotten for a long time, I am probably still using those basic qualities of Excel 3.0, but learning with that enterprise resource planning system when one finds features from there that quickens working or saves time or improves the quality of that process then when one sort of sees it, that this will save my time later on then one gets always a good feeling yes.”

Frustration was a common feeling to all the interviewees. CFO 3 said that most often the reason for the frustrations was bad design of the information system. CFO 2 and CFO 4 said that most often the problems were caused because of the disconnected network, not because of the software itself. In addition, CFO 4 and CFO 5 said that the frustrating part was when working time was spent in a useless way.

The interviewees were also asked to describe the reasons which make them continue the system usage and contrary which makes them discontinue the system usage (Context 26 – Motivation to continue information system usage (Q35)). The

idea behind these questions was to find if any concepts relating to cognitive absorption would occur.

The reasons why the interviewees would continue or discontinue a certain system usage can be seen from figure 12. On the left side are the reasons for continuing and on the right side are the reasons for discontinuing a system usage.

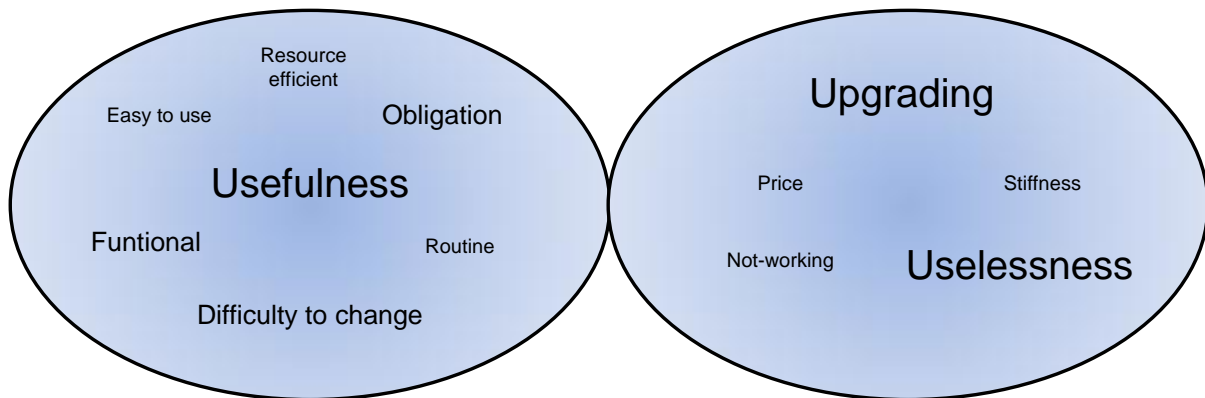


Figure 12. Reasons to continue or discontinue information system usage

The most common motivation to continue system usage was the concrete use that the system could provide to the user. This concept has proven to hold under multiple different research contexts and which Davis presented already in 1989. Also ease-of-use, which has been in Davis's model, emerged. Other interesting concepts that occurred was the obligation to use a certain system and the difficulty to change the current system, considering the amount of time and effort a person has to put on the implementation process.

CEO 1 explained that

"...switching is often quite, you know, quite like, quite you know troublesome and difficult so it's almost like some insurance seller calls you and he would like to tender your insurances so if you get a 20 euros advantage of it then that you have to read papers many hours and switch those insurances and then you wonder and compare then it is like it is easier to just continue, continue with the same and you know, suffer those few tens of damage from it ..."

Liao et al.'s (2011) finding about routines was confirmed by CFO 3, who said that

“...some things you just have gotten used to use ... but then some things you just have to use, for example now with this cash flow estimation ...”

Routine and the emotional burden that the switching might cause can be seen as cognitive process and therefore, the ideas that were presented in chapter 4 could also have significance with work-related information systems.

The reasons to discontinue information system usage were more monotonous and could be organized easier under few categories. For instance, uselessness held under such concepts like *“does not serve the needs”*, *“no use anymore”* and *“useless”* which all meant the same thing and therefore were organized under the category of Uselessness. The other upper category that could be formed was Upgrading, which held under such concepts as *“better one comes”*, *“development reasons”*, *“better and faster”*, *“other system”* and *“moment for switching”*. These reasons were more rational, although the need to upgrade could be based on both hedonic and utilitarian reasons and therefore, categorized as irrational and rational.

There were both rational and irrational factors that emerged when the users were asked to describe the reasons why to continue or discontinue a service use. However, more rational factors emerged, which is typical for work-related system usage.

Next and last chapter summarizes the theoretical and practical implications of the study.

7. Conclusions

The last chapter will summarize the research from theoretical and practical point of view, presents the limitations of the study and the suggestions for future research.

7.1 Theoretical implications

Electronic accounting, i.e. accounting information systems, has recently become a widely studied topic (e.g. Bagranoff et al., 2010; Deshmuk 2006). Enterprise resource planning systems, software as a service and other solutions integrated with accounting functions are common in all size companies, because of their benefits in savings and automation. The topic of this study, cash flow estimation, was picked because of its currency.

Attitudes towards technology have been a widely studied topic in information systems field (e.g. Davis, 1989; Ajzen and Fishbein, 1980; Rogers, 2003). The main finding of these studies has been that usefulness and ease-of-use, so-called utilitarian and rational factors, are the main determinants for person's intention to start using an information system. Only recently researchers have found that so-called hedonic and irrational factors, like emotions and aesthetic features, also influence person's intentions to start using an information system (e.g. Agarwal and Karahanna, 2000; Venkatesh, 2000). One of the main theories in this field is called cognitive absorption, meaning the deep involvement with software.

This study focused on specific accounting function, cash flow estimation, and the information system usage relating to this function. In this study, the information system in use was Excel. The research was conducted as a multiple case study. Special feature of the case companies was that they were all private equity financed.

The focus of this study was in hedonic and irrational factors, how they emerge and how they influence in initial and continuing system usage in a mandated environment. Special theoretical framework was cognitive absorption, which has not been studied widely under mandated, work-related environment. Cognitive absorption has mainly studied the usage of information systems under voluntary environment, i.e. on free-time (e.g. Wu and Lederer, 2009; Agarwal and Karahanna, 2000).

Results of this research supported strongly the earlier research made about attitudes toward information system usage both from utilitarian and hedonic aspect. However, it is important to notice that this study focused on mandated technology usage. Therefore, it was not self-evident that the previous theories would hold, as the previous theories have been conducted under voluntary usage.

The significance of rational factors, such as usefulness and ease-of-use (Davis, 1989), was acknowledged under mandated, work-related system usage. However, irrational factors, such as intrinsic motivation (Magni, 2010; Vallerand, 1997), aesthetics (Liao et al., 2011), flow (Csikszentmihalyi, 1990) and enjoyment (Agarwal and Karahanna, 2000), were also identified. These findings lead to a conclusion that supports the earlier findings about the coexistence of irrational and rational factors in the system usage, that also Magni et al. (2010) and Agarwal and Karahanna (2000) have studied. Different from the earlier studies is the finding that the coexistence can also happen under work-related system usage and that the rational and irrational factors are not mutually exclusive – even under mandated context. This confirms Gu et al.'s (2010) statement that recent information systems have both utilitarian and hedonic nature. Excel can therefore be categorized as multipurpose information system, as Gu et al. defines.

Agarwal and Karahanna (2000), Nadon et al. (1991) and Tellegen and Atkinson (1974) have all studied the appearance of absorption, i.e. deep involvement. They all claim that absorption is a personality trait that makes some people more prone to concentrate deeply in the information system usage. In addition, Agarwal and Karahanna (2000) claim that the existence of certain cognitive absorption dimensions in a person makes the appearance of cognitive absorption more likely, than if these dimensions did not appear. This study confirms the finding, as the interviewees, who acknowledged Agarwal and Karahanna's dimensions stronger, were also more straightforward about the possibility of appearance of cognitive absorption.

Agarwal and Karahanna (2000) claim that based on their study, cognitive absorption also explains the initial use of information system. In their theoretical model and findings cognitive absorption antecedes usefulness and ease-of-use. Agarwal and

Karahanna's study was conducted under voluntary technology usage. However, this study was conducted under mandated technology usage and the rational factors in the decision making process, such as usefulness, was highly stressed by the interviewees. Therefore, the accuracy of Agarwal and Karahanna's suggestion should be questioned under this, mandated technology usage context. However, as the possibility of cognitive absorption was not excluded according to the results, it can be suggested that cognitive absorption is the following process after usefulness and ease-of-use and not necessarily the first process to emerge. Cognitive absorption could also explain the continual usage, as suggested by Liao et al. (2011), Deng et al. (2010), Magni et al. (2010) and Ortiz de Guinea and Markus (2009).

The reasons that explain the continual usage of Excel in this research relate to earlier findings, which state that emotions (Ortiz de Guinea and Markus, 2009) and habits (Liao et al., 2011; Ortiz de Guinea and Markus, 2009) explain the motivation to continue technology usage. According to these studies, emotions and habits, which were both acknowledged in this study as well, trigger cognitive processes, which overtake the rational processes. Emotions and habits might explain the engagement of the interviewees with Excel in this research as well. This finding is especially interesting as the context of this study was work-related.

7.2 Managerial implications

This research provides valuable information for system developers.

First important finding was that each interviewee was implementing cash flow estimation manually with Excel. In some cases this task took remarkable resources from the interviewees working time. In addition, the forecasts were not current in all cases, which caused problems to some of the case companies. Companies acknowledged a possible need for a better cash forecasting system. The conditions for investing in such system were functionality, visual aesthetics and price, to name a few.

Second finding was that in private equity financed companies cash flow estimation is highly appreciated function and everyone is obligated to do it. The reason for this was that most private equity financed companies are short with cash and therefore,

cash flow estimation is vital for their business. Another reason was that the financials of the companies need to be transparent for the investors. The investor, who was interviewed to this research, was mainly not happy with the current forecasts.

Thirdly, this study identified the most important technical features in cash flow estimation information system that the interviewees suggested. The most important features were automation, integration, flexibility and SaaS, i.e. cloud-based service form. In addition, the visual functions, such as graphical features were brought up.

Finally, because it was found that the users experience flow, emotions, creativeness, deep concentration and joy with Excel, system developers should understand that also irrational factors matter in work-related system usage. Therefore, it is not indifferent how the system is being developed. To appeal to the users in multiple levels and to make sure the system usage is continued, it is important to engage the users with the information system deeply, not just on a rational level.

7.3 Conclusions

The purpose of this study was to find if rational, work-related information system usage could include cognitive processes, such as aesthetics, flow and enjoyment. The earlier studies about system usage and cognitive processes have mainly focused in voluntary system usage. This study provided new insight to the topic.

The most important finding was that cognitive dimension, like flow and enjoyment, occurred with most case company interviewees. This was not presumable, as cash flow estimation is highly rational task and Excel is a rational information system. The conclusion is that system developers should also take into account what kind of feelings the system usage arises in the user, to be able to affect in the user experience as a whole.

This study also suggests that with mandatory system usage cognitive absorption might not be the initial reason to start the system usage, but matters more in the continual usage.

Besides the theoretical implications, this study revealed how the case companies were implementing their cash forecasting at the moment, which were the causes of inaccuracies and which were the most desirable functions in cash flow estimation

system. The manual forecasting process was found to be inaccurate and time consuming in many cases. Automation and integration was desired. This study also provided information about the level at which the case companies were interested to invest in such system and found that there is potential for such a system, if the criteria of price and functionality are fulfilled.

7.4 Limitations of the study and future research

This study could have offered more reliable results if there would have been more interviews. There were six interviews implemented with the case companies and one interview implemented with the private equity investor. Strength was that each interviewee had strong experience in cash forecasting and therefore, could provide comprehensive answers about the topic.

The other weakness of this study was that each case company interviewee was using Excel as a forecasting tool at the moment. None of them had actual forecasting tool in use. The positive side in this was however, that all the interviewees had at least same system in use, so the comparison of the answers and opinions was easy to form.

Because the research was conducted qualitatively, it was challenging to analyze the data. Qualitative comparative analysis and coding technique were adapted. Coding technique especially is a challenging analysis method, as it requires abstraction and creativity to be able to find the main themes from the interviews and to form the main categories for the themes. For this purpose, theme clouds were formed to facilitate the analysis.

Last limitation of the study was the interview questions, as the interview templates were formed before the entire theory was ready. Therefore, some specifications would have been desirable in the interviews. Yet, the transcribed interviews assured that no important information was left out.

This study focused only on private equity financed companies among a narrow group of case companies. Future research suggestion is that cash forecasting and information systems should be examined among vaster group of companies or among vaster group of private equity financed companies.

The appearance of cognitive absorption with work-related system usage in general should be studied more. Future research should also examine the coexistence of hedonic and utilitarian factors. The point at which cognitive absorption is occurring with work-related system usage should be studied more, to find out if cognitive absorption affects only the user's intention to continue information system usage, not to start the usage.

Finally, the differences between individuals and the trait of absorption under mandated technology usage should be examined closer. Interesting research question could be whether cognitive absorption occurs in every individual, but if individuals that perceive themselves more rational than other individuals find it challenging to admit the appearance of irrational factors.

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Company B, CFO 2, 23.11.2011, 00:41:03

Company C, CFO 3, 25.11.2011, 00:50:39

Company D, CFO 4, 29.11.2011, 00:44:45

Company E, CFO 5, 29.11.2011, 00:59:23

Company F, CEO 1, 30.11.2011, 00:57:09

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APPENDICES

Appendix I Case company pre-questionnaire

1. Kuinka paljon yrityksenne liikevaihto on?
2. Millä tavalla hoidatte kassavirtaennustamisen (onko esim. jotain järjestelmää käytössä)?
3. Vaikuttaako ennustamiseen se, että olette (ainakin osin) pääomarahoitettu yritys, eli onko "painetta" tehdä ennusteita?
4. Kuka yrityksessänne on vastuussa ennustamisesta?
5. Mikä on haastavinta ennustamisessa?
6. Mikä helpottaisi kassavirtaennusteiden tekemistä?
7. Mitä ennustamiseen käytettäviä tietojärjestelmiä tunnet entuudestaan?
8. Luuletko, että ennustamiseen käytettävän järjestelmän käyttöön voisi vaikuttaa muutkin kuin hyötyperäiset motivaatiotekijät (esim. jos järjestelmässä olisi tiettyjä ominaisuuksia jotka tekisivät sen käytöstä mukavampaa, voisiko käytön syynä olla pelkkä järjestelmän käytön "mukavuus" tai hienot tekniset ominaisuudet)?

Appendix II Case company interview questions

Osa 1 Kassavirtaennustaminen ja järjestelmät

1. Kerro ensin kuka olet ja mitä teet?
2. Yrityksen profiili (toimiala, työntekijöiden määrä, liikevaihto ...)
3. Kuvaile vaihe vaiheelta tämän hetkinen ennustamisprosessi (esim. verkkopankin avaaminen, saldon katsominen, ...).
4. Millä aikavälillä teette yleensä ennusteita?
5. Kuinka pitkään ennusteen tekeminen kestää?
6. Kuinka usein teette ennusteita?
7. Kuinka tarkkaan ennusteet osuvat yleensä?
8. Mitkä kohdat eivät yleensä täsmää?
9. Mitä haittaa tästä koituu?
10. Mikä on kassavirtaennustamisen tärkein tehtävä?
11. Hyödynnättekö kassavirtaennusteita budjetoinnissa tai toisinpäin?
12. Mitä pääomarahoitaja edellyttää ennustamiselta?
13. Mitä laskentatoimeen liittyviä järjestelmiä yrityksellänne on tällä hetkellä käytössä?
14. Oletteko koskaan kokeilleet varsinaista ohjelmaa kassavirtaennusteiden tuottamiseksi?
15. Minkälainen olisi ihanteellinen kassavirtajärjestelmä (järjestelmäominaisuudet)?
16. Mikä on kassavirtaennustejärjestelmän tärkein ominaisuus?
17. Jos tällainen järjestelmä olisi, ostaisitteko palvelun?
18. Ostaisitteko palvelun tilitoimistolta vai erillisenä palveluna?

Osa 2 Kognitiivinen absorptio

19. Mitä ohjelmia joudut käyttämään työssäsi päivittäin?
20. Huomaatko koskaan näiden järjestelmien käytön yhteydessä, että olet menettänyt ajan ja paikan tajun?
21. Miksi luulet, että näin tapahtuu tai ei tapahdu?
22. Huomaatko kyseistä ilmiötä jonkun muun järjestelmän tai tietotekniikan käytön yhteydessä (esim. vapaa-ajalla)?
23. Pidätkö ennusteiden tai budjettien tekemisestä?
24. Pidätkö numeroista?
Nautinto / Enjoyment – koetko koskaan sellaisia tuntemuksia?
25. Osaatko arvioida kuinka monta tuntia päivässä käytät yleisesti eri järjestelmiä ja tietokonetta?
26. Turhaututko koskaan työhön liittyvää järjestelmää käyttäessä, jos se ei esimerkiksi toimi?
27. Saatko koskaan ”ahaa-elämyksiä” oppiessasi järjestelmästä jonkun uuden piirteen?
28. Mikä oli viimeisin ohjelma, jonka käyttöä jouduit opettelemaan?
29. Kuinka opettelu sujui?
30. Kontrolli, onko tärkeää?
31. Menetätkö maltin välillä uusien järjestelmien kanssa?
32. Sanoisitko, että olet luonteeltasi utelias oppimaan uutta?
Entä sanoisitko, että mielelläsi opettelet uutta?
33. Onko sinulla tapana ostaa uusinta teknologiaa (esim. iPad) koska haluat pysyä ajan hermolla ja oppia uutta?
34. Onko yrityksessänne luovuttu jonkun järjestelmän käyttämisestä?
35. Mitkä ovat yleensä syynä siihen, että lopetat jonkun tietyn ohjelman/järjestelmän käyttämisen?
Entä mikä on syynä siihen että jatkat jonkun tietyn järjestelmän käyttöä?
36. Voiko kassavirtaennustamiseen tarkoitetun järjestelmän käyttöön liittyä muitakin kuin hyötyperäisiä motivaatiotekijöitä?

Contexts:

- Context 1 – Open discussion (Open discussion)
- Context 2 – Interviewee and company profile (Q1-Q2)
- Context 3 – Description of the forecasting process (Q3)
- Context 4 – Forecasting horizon (Q4)
- Context 5 – Time spent on and frequency of forecasting (Q5-66)
- Context 6 – Accuracy (Q7)
- Context 7 – Sources and causes of inaccuracies (Q8-Q9)
- Context 8 – Most important function of cash flow estimation (Q10)
- Context 9 – Relation of cash flow estimation and budgeting (Q11)
- Context 10 – VC's expectations about forecasting (Q12)
- Context 11 – Accounting related information systems in use (Q13)
- Context 12 – Experience about cash flow estimation information system (Q14)
- Context 13 – Ideal forecasting system – features and qualities (Q15)
- Context 14 – Most important quality in cash forecasting system (Q16)
- Context 15 – Intentions to buy forecasting system (Q17)
- Context 16 – Preferred system provider (Q18)
- Context 17 – Information systems in use at work (Q19)
- Context 18 – Flow (Q20-Q22)
- Context 19 – Enjoyment in cash flow estimation and numbers (Q23-Q24)
- Context 20 – Time spent with information systems (Q25)
- Context 21 – Emotions: frustration, perception and anger (Q26-Q27)
- Context 22 – Learning to use an information system (Q28-Q29)
- Context 23 – Control (Q30)
- Context 24 – Curiosity and learning (Q32-Q33)
- Context 25 – Discontinued information system usage (Q34)
- Context 26 – Motivation to continue information system usage (Q35)
- Context 27 – Cognitive absorption in cash forecasting (Q36)
- Context 28 – Open discussion (Open discussion)

Appendix III Venture capital investment company interview questions

1. Kertoisitko kuka olet ja mitä teet?
2. Kuinka kauan olet ollut "alalla"?
3. Mikä on pääomarahojittajan tehtävä niissä yrityksissä joita se on rahoittanut ja kuinka se näkyy?
4. Kuinka suuri sana-/pääösvalta pääomarahojittajalla on yrityksessä?
5. Minkälaisia velvoitteita yrityksillä on pääomarahojittajalle?
6. Onko Suomessa jotain erityisiä säädöksiä taloudellisesta raportoinnista jos kyseessä on pääomarahojitettu yritys?
7. Mitä kaikkia taloudellisia raportteja he toimittavat teille?
8. Mitä itse velvoitat raportoinnilta?
9. Mikä on mielestäsi kassavirtaennustamisen tärkein tehtävä yrityksessä?
10. Kuinka tärkeänä pidät sitä pääomarahojittajan näkökulmasta?
11. Minkä aikavälin ennusteet ovat tärkeimpiä?
12. Tiedostavatko yritykset riittävästi kassavirtaennustamisen tärkeyden?
13. Oletko tyytyväinen tämän hetkiseen ennustamistapaan?
14. Jos kassavirtaennusteissa on mielestäsi jotain ongelmia, miten ne tulevat esiin?
15. Miksi luulet, että yrityksillä ei ole edelleenkään kassavirtaennustamiseen räätälöityä palvelua käytössä vaan suurin osa käyttää Exceliä?
16. Oletko tyytyväinen Exceliin?
17. Miksi?
18. Voisiko toisella järjestelmällä vaikuttaa parempaan ennusteen lopputulokseen?
19. Mitä erityistoivomuksia sinulla on kassavirtaennustejärjestelmiä kohtaan?
20. Mitä teknisiä/muita ominaisuuksia niissä pitäisi olla?
21. Luuletko, että yritykset ottaisivat tällaisen järjestelmän käyttöön?
22. Miksi?
23. Mikä olisi helpointa tällaisen järjestelmän käyttöön otossa?
24. Entä vaikeinta?

Contexts:

- Context 1 – Background information about the portfolio companies (Open discussion)
- Context 2 – Company information (Q1-Q2)
- Context 3 – Venture capital investor's mission in portfolio company (Q3)
- Context 4 – Decision power of venture capital investor (Q4)
- Context 5 – Obligations of portfolio companies (Q5)
- Context 6 – Finnish regulation (Q6)
- Context 7 – Types of financial reports delivered (Q7)
- Context 8 – Obligations set by investor to the portfolio companies (Q8)
- Context 9 – Most important function of cash flow estimation (Q9)
- Context 10 – Most important function of cash flow estimation from VC's point of view (Q10)
- Context 11 – Most important time horizon (Q11)
- Context 12 – Consciousness of portfolio companies about the importance of cash flow estimation (Q12)
- Context 13 – Satisfaction to the current forecasting processes (Q13)
- Context 14 – Origin of the problems in forecasting (Q14)
- Context 15 – Reasons for Excel's popularity/lack of forecasting system in use (Q15)
- Context 16 – Personal satisfaction level in excel forecasting (Q16-Q17)
- Context 17 – Chances for better forecasts with other systems (Q18)
- Context 18 – Special wishes towards forecasting system (Q19)
- Context 19 – Technical wishes towards forecasting system (Q20)
- Context 20 – Probability of companies taking forecasting system in use (Q21-Q22)
- Context 21 – The easiest part in launching forecasting system in use (Q23)
- Context 22 – Most difficult in launching forecasting system in use (Q24)
- Context 23 – Ideas for cash forecasting system developers (Open discussion)