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# ***Decision making for IT service selection in Swedish SMEs***

A study with focus on Swedish Small and Medium Sized Enterprises

Bachelor's thesis within Informatics

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## **Bachelor's Thesis in Informatics**

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## **Abstract**

### **Problem**

There is a lack of knowledge about how Swedish SMEs make decisions on IT service selection. There is also lack of information about the attributes of IT service providers that are most important to Swedish SMEs. By discovering these attributes, IT service providers could focus on improving their services in those dimensions and become more attractive for Swedish small and medium enterprises.

### **Purpose**

The purpose of this research is to investigate the decision making process over selection of IT services for small and medium sized enterprises (SMEs) in Sweden. Additionally, this research intends to discover the most important features (attributes) of an IT service provider in its selection.

What are the steps involved in decision-making process? What decision-making methods can be used to help explain the process that goes on in the minds of the decision makers? What aspects influence their behaviour when decision makers prefer one service provider to another?

IT service comprises of internet-based services such as web hosting, email services, online backup services and cloud apps or locally offered IT services such as IT helpdesk. The candidates who were interviewed were employees or entrepreneurs who work and live in Sweden.

### **Method**

This research was conducted with an inductive approach using mono method for semi-structured interviews for primary data collection. Secondary data collection was multiple-source through literature reviews in order to learn about different attributes and current knowledge about this subject. The research method was qualitative with exploratory strategy in order to get insights into managers' decision-making processes. Sampling was non-probability purposive method with sample size as saturation method. The focus was illustrative and method chosen as typical case.

### **Conclusion**

The conclusions of this thesis illustrates that the important attributes (features) of IT services required by Swedish SMEs are the requirement that the service is being offered from Sweden, due to tax conformity laws and security matters. Moreover, SAT, WADD, FRQ and EBA are decision-making heuristics in use by the companies in selection of suitable IT services.

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# **I Introduction**

## **1.1 Background**

Today computers can be found everywhere, automating every aspect of our lives. Initially, personal computers were used in larger companies and offices to speed up tedious tasks such as calculations that required high accuracy. Boring and repetitious tasks were increasingly assigned to computers to perform.

While some of these services are by nature only available on the internet (web hosting, electronic mail box), the creation of internet has helped bring traditional services such as accounting and filing (archiving) online and accessible to increasing number of people. Today, there are hundreds of different services offered online and the competition is fierce.

An ever-increasing number of services are now offered online. Organizations need to select the right alternative by comparing features of IT services on offer. There is a need to know what features (attributes) of different choices (alternatives) they require to pay attention to, in order to pick the best choice in the shortest amount of time. These attributes may be different from traditional services due to their online and IT related nature.

## **1.2 Problem Statement**

Today, IT tries to solve, improve or speed-up every aspect of our lives. Cloud-based services offer more options at lower prices, web-hosting providers offer an array of different services and options. Small and medium sized enterprises may not be computer savvy and may not have their own IT department or IT responsible person.

The knowledge gap that this thesis tries to fill is how Swedish SMEs make their decisions on selection of an IT service provider. What are the aspects influencing their decisions? What properties of IT services affect customers to prefer one service provider to another? What factors separates Swedish SMEs' needs from SMEs in other countries?

## **1.3 Purpose & Research Questions**

This thesis intends to explore how small and medium sized enterprises in Sweden select IT service providers. IT services include but are not limited to online services such as web hosting, electronic mail box, online backups, cloud apps or local services such as IT helpdesk.

The first (main) question wishes to find out the decision-making strategies that help enterprises select the best choice for their organization. What information do they rely on, what information do they seek, what is the information processing that they perform and what is the extent of their search in order to find all or most alternatives. The main research question has been selected as:

- *"Which decision making strategies have the most contribution in IT service selection by small and medium sized enterprises?"*

The second research question aims to find out the most important attributes of different "IT service provider" alternatives. What are the most important aspects to small and medium enterprises in Sweden and as a result, how could IT service providers improve their offerings to Swedish SMEs and increase their chances of being selected.

The second research question that will contribute to IT service companies in creating a more attractive proposal for Swedish SMEs has been selected as:

- “What are the most important attributes of an “IT service provider” in its selection?”

## 1.4 Delimitations

Several limitations restrict the scope of this research. Time, available resources, financial aspects and information availability are some of the main restraints that limit the scope. The focus of this thesis will primarily be on Swedish small and medium sized enterprises (SMEs) with sizes between two to fifty employees. The companies partaking in this research are registered in Sweden and in the following industry sectors; web development, waste management and carpet wholesaler/importer. The interviewees are the IT responsible person in each company.

Since this research takes place in Sweden, the context of the research pertains to Swedish companies and may not be generalizable. Thus, study of a small sample of companies is adequate for this research.

## 1.5 Definitions

**Small and medium sized enterprise (SME):** These are companies with number of personnel under certain limits and the terminology is used by European Union (EU), World Bank, World Trade Organization (WTO) and United Nations (UN) (TheFreeDictionary, 2014). These small enterprises outnumber large organizations many times over and are believed to be responsible for driving innovation and competition (TheFreeDictionary, 2014). Under European Union law, medium-sized enterprises stands for companies of under 250 employees, small companies of under 50 employees and micro-entities of up to 10 employees (TheFreeDictionary, 2014). The terminology includes micro entities. In Swedish: Små och medelstora företag (SMF).

**Jönköping:** Pronounced Yon-sho-ping, it is Sweden’s 10<sup>th</sup> largest city with population of approximately 130’000 (Statistics Sweden, 2013).

**Decision Making:** This is the rational, mental process of selection of one alternative from several. The selection happens according to decision maker’s preferences, available time, depth and scope of search and understanding of outcomes for each choice.

**Weighted Additive (WADD):** This process considers all relevant attributes and their weights (importance) for each alternative. The sum of “attribute value multiplied by their relative attribute weight” generates a score for that alternative and the alternative with the highest score is selected (Payne *et al.*, 1993). Attribute weight (importance) has to be defined in advance.

**Equal Weight Heuristic (EQW):** This heuristic is simplified WADD where it ignores weight (importance) for attributes (Payne *et al.*, 1993).

**Satisficing Heuristic (SAT):** Heuristic in which an alternative attribute values are compared to a pre-determined cut-off level and those alternatives with attribute values lower than the cut-off level are eliminated (Payne *et al.*, 1993). Cut-off level is lowered if no alternative pass all cut-offs (Payne *et al.*, 1993). An implication of this process is the

dependency of choice on the order in which alternatives are evaluated; first alternative that passes all cut-off levels is selected (Payne *et al.*, 1993).

**Lexicographic Heuristic (LEX):** In this process, most important attribute is determined and then the alternative with the highest value on this attribute is selected (Payne *et al.*, 1993). Alternatives with same values will be evaluated on the second most important attribute and so on (Payne *et al.*, 1993).

**Elimination by Aspects Heuristic (EBA):** In this heuristic, after most important attribute is determined and cut-off value set, all alternatives below the cut-off value are eliminated (Payne *et al.*, 1993). Then the process continues with second most important attribute and so on until only one alternative remains (Payne *et al.*, 1993).

**Majority of Confirming Dimensions Heuristic (MCD):** This process begins by comparing values of attributes for pairs of alternatives (Payne *et al.*, 1993). The alternative with majority of winning attributes is retained and the alternative is again compared to next alternative until all alternatives are processed and final winning alternative remains (Payne *et al.*, 1993). MCD is simplified version of ADDIF model (Tversky, 1969 cited in Payne *et al.*, 1993).

**Additive Difference (ADDIF):** In this process, the alternatives are compared on each attribute and the difference between two alternatives' values is determined (Payne *et al.*, 1993). *'Then a weighting function is applied to each difference and the results are summed over all dimensions to obtain an overall relative evaluation of the two alternatives.'* (Payne *et al.*, 1993, p. 28).

**Frequency of Good and Bad Features Heuristic (FRQ):** During this process, decision makers develop cut-offs for defining "good" or "bad" features and then counts of the "good" or "bad" features of alternatives are evaluated (Payne *et al.*, 1993).

## **1.6 Abbreviations**

**DM:** Decision Making

**JIBS:** Jönköping International Business School

**SME:** Small and Medium sized Enterprise

**SMEs:** Plural form of an SME

**SMF:** Små och medelstora företag (SME in Swedish)

**IT:** Information Technology

**ERP:** Enterprise Resource Planning

**AB:** Aktiebolag (Limited Liability Company, LLC)

**HB:** Handelsbolag (Partnership Company)

**F-Skatt:** Registered for Corporation Taxation

**SAP:** Systems Applications and Products

**FCHB:** First Chance HB (name of a partnership company)

**SSAB:** SEAB Synergy AB (name of an LLC company)

**NCAB:** North Carpet AB (name of an LLC company)

**EU:** European Union

## **2 Theoretical Framework**

The purpose of this chapter is to provide the theoretical framework of the study while clarifying concepts and terms, which will be used in the thesis. This chapter demonstrates the foundation of decision making as well as a deeper look at its processes, limitations and properties. The second part of the chapter looks at the most important decision-making methods.

### **2.1 Decision Making**

Decision-making is the mental (cognitive) process of selecting one from several alternatives. This selection occurs according to the decision maker's preferences, scope of search, available time, depth of research and understanding of consequences of each choice. According to (March, 1994), decision making is a rational procedure that follows logic of sequence to answer four basic questions:

1. Alternatives; Which actions are possible?
2. Expectations; What are the future consequences and likelihood of each selected alternative?
3. Preferences; How valuable is each alternatives' future consequence to the decision maker?
4. Decision rule; How is a choice going to be made regarding consequence values?

Payne, Bettman & Johnson (1993) claims that one distinction between decision-making and other types of problem solving tasks is that decision problems have undefined final state goals and vague trade-off values, if needed at all. Therefore, before the process of decision-making begins, the decision maker must define the problem statement, clarify and set up sub goals and evoke processes that accomplish such subtasks (Payne *et al.*, 1993).

### **2.2 Rational Choice Theory**

The study of decision-making theory is the study of rational choice theory, which belongs to theories of human behaviour (March, 1994).

While in certain versions of rational choice theory it is assumed that all choice preferences are well-known, consistent and accurate, other well-established versions recognize the uncertainty regarding the future consequences of present actions (March, 1994).

### **2.3 Decision Strategies**

*'Strategy can be thought of as a method (a sequence of operations) for searching through the decision problem space.'* (Payne *et al.*, 1993, p. 23). Choice of strategy depends on many aspects. Payne *et al.* (1993) suggests that choosing one decision-making method over another depends on the number of alternatives to be considered. While decision makers utilize decision strategies that use all relevant information for choices with two or three alternatives (normative), they adopt strategies that use information selectively for simplifying choices with several alternatives (heuristic) (Payne *et al.*, 1993). *'Some of the strategies used by people can be thought of as conflict confronting and others as conflict avoiding.'* (Hogarth, 1987 cited in Payne *et al.*, 1993, p. 23). Payne *et al.* (1993) holds that general aspects of decision processes are as follows:

1. Decision problems often involve conflict among values since no single option best meets all objectives

2. Evaluation strategies can be used stand-alone or in combination with other strategies
3. Strategies can be constructed on-the-spot or their use can be planned a priori (meaning strategy that can be derived by reasoning)
4. Strategies vary by the level of accuracy and amount of effort needed

## 2.4 Risk in Decision Making

Since decision makers cannot be certain about the consequences of a choice over others, post-decision regret and surprise can ensue regarding the failure or success of their choice (March, 1994). It is in the nature of decision making to have risks involved because decisions cannot be taken with complete certainty. According to March (1994), when facing a risk, choice alternatives are assessed by their uncertainty (risk) as well as expected values (preference).

## 2.5 Effort and Accuracy

Accuracy of decision-making depends on many factors. Payne *et al.* (1993) states that people desire to be accurate and at the same time conserve their limited cognitive responses. In other words, they choose the best strategy that comprises of the best combination of accuracy versus time or cognitive limitation. *‘Often people seem to behave according to Zipf’s 1949 principle of least effort, in which a strategy is selected that ensures that the minimum effort will be involved in reaching a specific desired result.’* (Zipf, 1949 cited in Payne *et al.*, 1993, p. 13). The following figure illustrates the amount of effort used in different decision making heuristics as opposed to the accuracy achieved. EIP stands for amount of effort and RC stands for random choice rule.

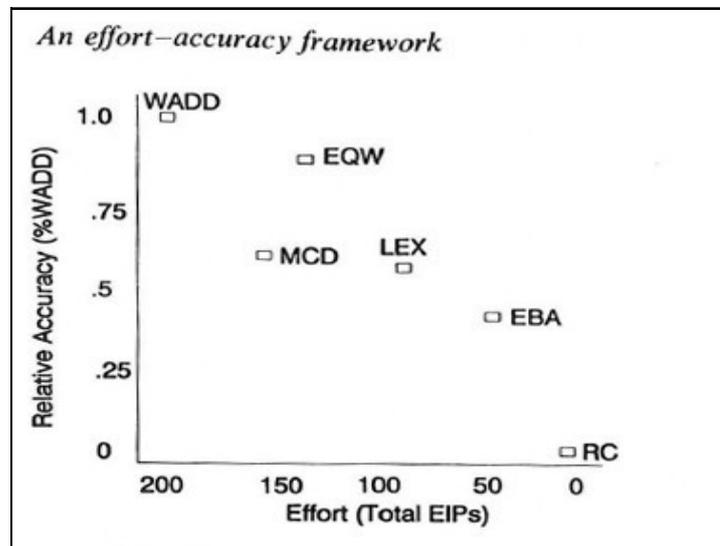


Figure 2.1 Effort and accuracy levels for various strategies, Payne *et al.*, (1993)

The accuracy of the decision-making is also affected by the validity and accuracy of the information about the alternatives, expectations and goals. March (1994) argues that as decision makers assess consequences and incentives, the information available to them is rarely “innocent”; it is most likely collected and presented by others who may have their own agenda and reasons for shaping the information. As increasing the importance of a decision increases the amount of effort for the decision maker, she/he may work harder,

change certain parameters of the decision strategy or change decision strategies altogether (Payne *et al.*, 1993).

## **2.6 Improving Decision Making**

March (1994) argues that by considering risk into rational choice theory, the original four questions can be improved by considering the assumptions regarding the following four dimensions:

1. Pre-existing assumptions about decision makers' information concerning the world and other actors
2. Assumptions about the number of decision makers
3. Assumptions about preferences for evaluation of alternatives
4. Assumptions about decision rule according to which alternatives are chosen.

Payne *et al.* (1993) argues that decisions can be improved by changes to the information environments where individuals make judgements. However, this could mean that the presentation of information in one way could influence the decision maker to select a choice that they would not have otherwise selected. Payne *et al.* (1993) claims that presentation of information or even changes in the way decision related questions are asked makes decision makers become vulnerable to strategic manipulation by others. Thus, flexible presentation of information can introduce both problems and opportunities for decision problems (Payne *et al.*, 1993).

## **2.7 Limited Rationality**

The process of decision-making is limited by human mental capacity in several ways. Not all alternatives, future consequences and preferences are known in advance and at the same time.

Human beings' limited cognitive capacity leads to having incomplete information, which results in decision makers' inability to know all alternatives and future consequences at the same time or all at once. The limitations of human mind dictates that at any time during the process of decision making, one thing or another gets missed, misinterpreted or otherwise adversely affecting decision making quality. According to March (1994), decision makers typically seem to consider only few alternative and consider them sequentially instead of simultaneously, failing to consider all consequences of alternatives and by focusing on certain alternatives while ignoring others. March (1994) continues, that often relevant information about different consequences is neither sought after nor used, that leads to having incomplete and conflicting goals which in return are not all considered at the same time. This limited cognitive capacity leads to decision makers not having the complete picture or a holistic view of the problem at hand and making a decision based on processed part of the information.

## **2.8 Conflict**

Shepard (1964 cited in Payne *et al.*, 1993) asserts that in a decision-making context, conflict is typically present in the sense that no single option is the best on all attributes of value and that conflict is recognized as a major source of decision difficulty. Moreover, the task may also be unfamiliar in the sense that a conflict resolution rule cannot be drawn from memory (Payne *et al.*, 1993). Therefore, *'solving decision problems often is not the kind of "recognize*

*and calculate” process associated with expertise in a task domain.’ (Chi et al., 1988 cited in Payne et al., 1993, p. 21).*

Conflict in decision-making is also caused by other reasons such as:

1. Ambiguity in information about alternatives
2. Attributes
3. Expectations
4. Future consequences regarding each choice

Qualitative values and the threshold that an attribute may fall short or pass are not easy to set. Moreover, this threshold can change during the search for information about alternatives or during the decision-making phase. March (1994) characterizes this by stating that as decision makers try to comprehend the complex world with their limited rationality, they are inclined to deal with summary numerical representation of reality, for example income statements and cost-of-living indexes. March (1994) continues to explain that the risk with simplifying qualitative information is that the quantified numbers become quite real, as numbers related to above example will be treated as though they were the things they represent. March (1994) asserts that conflict may also arise from the demands of alternative identities when personal interests conflict with higher authority rules, for example professional ethics may conflict with organizational profits.

## **2.9 Constraints**

Decision makers face a series of constraints that directly affect the information with which they would have to make decisions. According to March (1994), there are four limitations that decision makers face:

1. Problems of attention; Limited attention capability and multitasking ability
2. Problems of memory; Limited mental information storage capacity, unreliable knowledge storage and retrieval
3. Problems of comprehension; Limited comprehension capacity, difficulty organizing, summarizing and using information, failure to make logical interpretation by connecting different part of available information
4. Problems of communication; Limited capacity for information communication and sharing especially across cultures, generations or professions as different people use different world simplification frameworks

Furthermore, constraints on available time affect decision accuracy that may lead to the preference of selecting non-compensatory decision strategies over compensatory strategies.

## **2.10 Coping with Limitations**

There are various strategies that decision makers employ to cope with their limited capabilities. March (1994) addresses this issue as decision makers tend to abstract central parts of the problem while ignoring other parts. March (1994) adds, decision makers seek information but they see what they want to see and overlook the unexpected things all while they adopt understandings of the world by filling in missing information and suppressing discrepancies in their understandings. This coping mechanism inadvertently introduces a bias to the decision makers that may lead to making wrong decisions based on false assumptions. According to March (1994), there are four fundamental simplification processes that decision makers utilize in order to abstract their problems:

1. Editing; Decision makers are likely to simplify and edit problems before they are entered into a choice process
2. Decomposition; Decision makers break up larger problems into their component parts, presuming that problems can be defined in a way that solving various individual components of a problem will result in a solution to the large-scale problem
3. Heuristics; Decision makers recognize patterns of new problems and apply rules suitable to those situations from past experiences. People can tell the outcome of events by referring to the past occurrence frequency of similar events, thus projecting future probabilities
4. Framing; Decisions are framed by beliefs about the problems, collected information and dimensions of evaluation. Frames focus decision maker attention while simplifying analysis by narrowing problems.

When decision makers are faced with challenging decisions, they tend to deal with summarized numerical representation of reality such as profit & loss statements or cost-of-living indexes (March, 1994). However, numerical representations of real world can become problematic as March (1994) argues that not only is it difficult to characterize and measure the extent to which different criteria match a scale, but also that measurement is debateable and prone to ridicule. Definition of the problem alternatives through numerical representation introduces ambiguity and conflict because it is difficult to calculate the level to which each alternative meets the criteria.

For example, how does one estimate the value for happiness? Is it possible to simply assign a value of 1 to 10 to otherwise ungraspable information? March (1994) points out that while assigned numerical values initially help simplify ambiguous information, these values will be treated as if they were the things they represent. Moreover, these values may be biased and inclined to be created to serve the creator's interests. While numerical values help simplify presentation of otherwise complicated matters, it introduces possibility of changing the meaning of the thing they are representing by changing the cut-off value or assigning politically motivated values to choices. The version of truth depends on one's own perspective according to personal values and heuristics.

According to March (1994), while it is assumed that rational decision makers choose among the alternatives by considering their consequences and selecting the alternative with the best return, others have observed that decision makers prefer to satisfice rather than maximize. Maximizing involves choosing the best alternative, satisficing involves choosing an alternative that exceeds some criterion or target (March, 1994). According to March (1994), while maximizing procedure for choosing equipment to purchase involves finding the best combination of prices and features available, a satisfying strategy would select equipment that fits specifications and falls within budget. Maximizing strives to find the best choice by examining all criteria for all choices and selecting the one with the highest rank but satisficing only requires comparison of alternatives until one is found that satisfies the minimum requirements (March, 1994). In other words, under satisficing, a choice that is good-enough has no higher rank than another that satisfies all criteria if that same good-enough choice was considered first. March (1994) notes that decision makers tend to maximize on some dimensions of the problem and satisfice on others.

## **2.11 Attention and Search**

March (1994) stresses that, in theories of limited rationality, attention is a limited resource. *'Not all alternatives are known, they must be sought; not all consequences are known, they must be investigated; not all preferences are known, they must be explored and evoked.'* (March, 1994, p. 23). The decision maker can improve the decision making process by allocating more time and attention. *'The study of decision making is, in many ways, the study of search and attention.'* (March, 1994, p. 23). In the stimulus-rich and opportunity-filled modern world, the importance of time and scheduling and concerns about *information overload* are distinct grievances (March, 1994). When attention and time is scarce, the decision maker can no longer investigate all alternatives or learn about all attributes of every alternative. He reiterates *'Decisions will be affected by the way decision makers attend (or fail to attend) to particular preferences, alternatives, and consequences.'* (March, 1994, p. 24). On the other hand, when information has no decision value or when a piece of information will not affect choice, then it is not worth the attention of the decision maker (March, 1994).

Decision makers can use *satisficing* as a means of search rule to decrease the amount of time taken to make decisions (March, 1994). Satisficing as a rule can help decision makers by specifying the conditions under which search is initiated or concluded, directing search to areas that need it more (March, 1994). As information needs to be acquired, the search is increased. If the search is satisfactory in delivering the needed information, search is decreased.

## **2.12 General Properties of Choice Heuristics**

In order to compare strategies of choice, researchers have often defined those using rather broad and global characteristics Bettman (1979 cited in Bettman, Johnson & Payne, 1991).

### **2.12.1 Compensatory versus Non-compensatory**

An important distinction among rules is the extent of compensatory processing compared against non-compensatory processing (Bettman, Johnson & Payne, 1991). *'Some rules (e.g., the lexicographic rule) are non-compensatory, since excellent values on less important attributes cannot compensate for a poor value on the most important attribute.'* (Bettman *et al.*, 1991, p. 60). Rules such as *weighted additive* or *equal weight heuristic* are compensatory because high values on some attributes can compensate for low values on others (Bettman *et al.*, 1991).

### **2.12.2 Consistent versus Selective Processing**

Bettman *et al.*, (1991) explains an aspect of choice processing is the extent to which the amount of processing is consistent or selective across alternatives or attributes. Bettman *et al.*, (1991) continues, in other words for each alternative or attribute, is the same amount of information being examined or does it vary?

While consistent processing involves analysis of all information for every alternative and attribute, variable (selective) process eliminates alternatives or attributes based on partial processing of information without considering whether additional information may possibly compensate for a poor value (Bettman *et al.*, 1991). As a rule, it is assumed that more consistent processing among alternatives indicates a more compensatory decision strategy Payne (1976 cited in Bettman *et al.*, 1991).

### **2.12.3 Amount of Processing**

According to Bettman *et al.* (1991), whether processing is consistent or selective the total amount of information examined can vary, thus leading to a processing that can be quite brief to very thorough. The total amount of information processed for strategies such as Lexicographic (LEX), Satisficing (SAT) and Elimination by Aspects (EBA) is dependent upon the particular values of the alternatives and the cut-off levels (Bettman *et al.*, 1991).

### **2.12.4 Alternative-based versus Attribute-based Processing**

Bettman *et al.* (1991) asserts, this processing aspect involves whether the search and processing of alternatives is accomplished vertically (often called holistic, alternative-based) or horizontally (dimensional or attribute-based).

*'In alternative-based processing, multiple attributes of a single alternative are considered before information about a second alternative is processed.'* (Bettman *et al.*, 1991, p. 60). *'In contrast, in attribute-based processing, the values of several alternatives on a single attribute are processed before information about a second attribute is processed.'* (Bettman *et al.*, 1991, p. 60). Russo & Doshier (1983 cited in Bettman *et al.*, 1991) claim that attribute-based processing is cognitively easier.

### **2.12.5 Quantitative versus Qualitative Reasoning**

Heuristics also differ depending on the degree of quantitative versus qualitative reasoning used (Bettman *et al.*, 1991). Heuristics that include quantitative reasoning operations such as EQW requires summing of values, FRQ requires counts and WADD includes multiplying two values (Bettman *et al.*, 1991). In contrast, most of the reasoning involved in other heuristics are more qualitative in nature, involving simple comparisons of values (Bettman *et al.*, 1991).

### **2.12.6 Formation of Evaluations**

Heuristics can also differ regarding whether or not an evaluation for each alternative is formed (Bettman *et al.*, 1991). In EQW or WADD rules, each alternative is given a score that represents its evaluation as a whole; on the other hand, rules such as EBA or LEX eliminate some alternatives and select others without an overall evaluation (Bettman *et al.*, 1991).

## **2.13 Decision Making Strategies**

There are several strategies available to decision makers. Choosing one strategy over others depends on many factors, including how thorough the decision makers want to examine aspects of the choices, the importance of the decision and the available time. Einhorn and Hogarth (1981 cited in Payne *et al.*, 1993) have strongly reaffirmed that information processing in decision making is highly contingent on the demands of the task and that an individual uses different kinds of strategies contingent upon factors such as how information is displayed, nature of the response and the complexity of the problem.

### **2.13.1 Weighted Additive (WADD)**

WADD considers values of each alternative on *all* the relevant attributes and considers *all* the relative importance (or weights) of the attributes to the decision maker (Payne *et al.*, 1993). In other words for each alternative, the sum of (given attribute value multiplied by

attribute weight) produces a score for that alternative. The alternative with highest score is selected. Attribute weight (importance) has to be pre-determined and attribute values for each alternative is produced afterwards while considering each alternative. Further, the conflict among values is assumed to be confronted and resolved by explicitly considering the extent to which one is willing to trade off attribute values, as reflected by the relative importance or weights (Payne *et al.*, 1993). Payne *et al.* (1993) explains further that weights can have an adding or averaging effect where in averaging model weights for an alternative all add up to sum to one, in other words it is normalized. It is apparent that WADD model requires more computational power and thus more complicated to process than other simpler (heuristics) methods.

### **2.13.2 Equal Weight Heuristic (EQW)**

Payne *et al.* (1993) explains that the processing strategy examines all the alternatives and their attribute values. The equal weight strategy simplifies decision making by ignoring information about the relative importance or probability of each attribute (Payne *et al.*, 1993). Therefore, this is a simplification of WADD where weights or importances are taken out of the equation. Payne *et al.* (1993) maintains this heuristic has been promoted as a very accurate simplification of the decision making process.

### **2.13.3 Satisficing Heuristic (SAT)**

Satisficing has been recognized as one of the oldest heuristics in decision-making literature (Simon, 1955 cited in Payne *et al.*, 1993). Payne *et al.* (1993) explains that in satisficing strategy, alternatives are deliberated one at a time and in the order they occur in the set. *'This heuristic compares the value of each attribute of an alternative to a predefined cut-off level; if any attribute value is below the cut-off, then that alternative is rejected.'* (Payne *et al.*, 1993, p. 26). Payne *et al.* (1993) continues, the first alternative that meets the cut-off values for all attributes is chosen; if no alternatives pass all the cut-offs, then these cut-off values can be lowered and the process repeated. One of the implications of this heuristic is that choice is dependent on the order in which the decision maker evaluates alternatives meaning that the first alternatives of two with same cut-off values is the chosen one (Payne *et al.*, 1993).

### **2.13.4 Lexicographic Heuristic (LEX)**

Payne *et al.* (1993) states, this choice strategy determines the most important attribute then evaluates the values of all alternatives on that attribute. Payne *et al.* (1993) explains, the alternative with the best (highest) value on the most important attribute is chosen. If two alternatives have tied (same) values, the second most important attribute is evaluated and so forth until the tie is broken (Payne *et al.*, 1993).

### **2.13.5 Elimination by Aspects Heuristic (EBA)**

The EBA procedure involves determining the most important attribute, then the cut-off value for that attribute is set and all alternatives with values for that attribute below the cut-off are eliminated (Payne *et al.*, 1993). *'One can interpret this process as rejecting or eliminating alternatives that do not possess an "aspect"; the "aspect" is defined as having a value on the selected attribute that is greater than or equal to the cutoff level.'* (Payne *et al.*, 1993, p. 27). The EBA heuristic continues with the second most important attribute then the third and so forth until only one alternative is left.

### **2.13.6 Majority of Confirming Dimensions Heuristic (MCD)**

The MCD heuristic begins by processing pairs of alternatives compared on the value of each attribute, the alternative with majority of better (winning) attribute value is retained (Payne *et al.*, 1993). *'The retained alternative is then compared with next alternative among the set of alternatives'; 'The process of pairwise comparison repeats until all alternatives have been evaluated and the final winning alternative has been identified.'* (Payne *et al.*, 1993, p. 27). MCD is a simplified version of a more general model called the additive difference (ADDIF) model (Tversky, 1969 cited in Payne *et al.*, 1993)

### **2.13.7 Additive Difference (ADDIF)**

In this strategy, the alternatives are compared on each dimension and the difference between the subjective values of the two alternatives in that dimension is determined (Payne *et al.*, 1993). *'Then a weighting function is applied to each difference and the results are summed over all dimensions to obtain an overall relative evaluation of the two alternatives.'* (Payne *et al.*, 1993, p. 28).

### **2.13.8 Frequency of Good and Bad Features Heuristic (FRQ)**

Decision makers evaluate alternatives based on counts of the “good” or “bad” features that the alternatives hold (Payne *et al.*, 1993). The decision maker would first need to develop cut-offs for specifying “good” or “bad” features, then they would count the number of these features (Payne *et al.*, 1993). Depending on whether the person focused on bad or good features (or both), different variants of this heuristic would develop (Payne *et al.*, 1993).

### **2.13.9 Combined Strategies**

Decision makers sometimes take advantage of a combination of strategies. Typically, combined decision making strategies have a preliminary phase where poor alternatives are eliminated and then in the second phase they examine the remaining alternatives in more detail (Payne, 1976 cited in Payne *et al.*, 1993).

### **2.13.10 Other Heuristics**

There are several simpler heuristics available, which are relevant for repeated choices (Payne *et al.*, 1993). *Habitual heuristic* and *affect referral* are common choices. In habitual heuristic, the individual chooses what they chose last time while in affect referral, the individual draws a previously formed evaluation for each alternative from memory and selects the best alternative without considering detailed information about the attribute (Payne *et al.*, 1993).

Table 2.1 General properties of choice heuristics, Payne *et al.*, (1993)

Heuristics	Compensatory (C) versus non-compensatory (N)	Information ignored? (Y/N)	Consistent (C) versus Selective (S)	Attribute-based (AT) versus Alternative-based (AL)	Evaluation formed? (Y/N)	Quantitative (QN) versus Qualitative (QL)
WADD	C	N	C	AL	Y	QN
ADDIF	C	N	C	AT	Y	QN
EQW	C	Y	C	AL	Y	QN
EBA	N	Y	S	AT	N	QL
SAT	N	Y	S	AL	N	QL
LEX	N	Y	S	AT	N	QL
MCD	C	Y	C	AT	Y	QN
FRQ	C	Y	C	AL	Y	QN

WADD = weighted additive; ADDIF = additive difference; EQW = equal weight; EBA = elimination-by-aspects; SAT = satisficing; LEX = lexicographic; MCD = majority of confirming dimensions; FRQ = frequency of good/bad features

## **3 Methodology**

This chapter describes how the research is performed. It starts by describing types of research philosophy, the research approach and method, how data is collected and analysed and steps taken to ensure that data is valid and reliable.

### **3.1 Research Philosophy**

Research philosophy is a term used in relation to knowledge development in a new field and the nature of such knowledge (Saunders, Lewis & Thornhill, 2007). The selected research philosophy contains assumptions about how one perceives the world and these assumptions underpin the research strategy and chosen methods (Saunders *et al.*, 2007). While there are no better or worse research philosophies, certain philosophies correspond with certain views of the world.

Therefore, there is no 'best' philosophy and it all depends on the view of the researcher on a particular subject and what suits the research questions better. Saunders *et al.* (2007) explains that there are three major ways of thinking about research philosophy and each influence the way in which you think about the research process. Johnson & Clark (2006 cited in Saunders, Lewis & Thornhill, 2009) claim the main importance is how well we are able to reflect on our selected philosophical choices and defend them in relation to the other alternatives we could have adopted.

#### **3.1.1 Epistemology**

Epistemology is regarded acceptable knowledge in a field of study. The chief distinction is that a 'resource researcher' is interested in collection and analysis of facts and real data about objects and a 'feelings researcher' is interested in attitudes and feelings of people (Saunders *et al.*, 2009). While the resource researcher can be more objective towards collected data as they have a separate existence to the researcher, the feelings researcher studies social phenomena which has no external reality (Saunders *et al.*, 2009). There are three distinct perspectives of epistemology: positivism, realism and interpretivism.

##### **3.1.1.1 Positivism**

In positivism, the researcher observes a phenomena as a natural scientist would and works with an observable and measurable social reality with result of research as law-like generalization (Saunders *et al.*, 2007). In positivism, the researcher uses existing theory to develop hypotheses that will be tested and either confirmed wholly, in part or disproved completely leading to development of a theory that can be tested by future research (Saunders *et al.*, 2007).

##### **3.1.1.2 Realism**

The essence of realism is that what our senses show us about reality is the truth and that objects' existence are independent of the human mind (Saunders *et al.*, 2007). Realism is analogous to positivism as it assumes a scientific approach to knowledge development (Saunders *et al.*, 2007). There are two forms of realism, direct realism and critical realism. Direct realism defines what we observe through our senses is the accurate portrayal of the world, whereas critical realism argues that what we experience are mere sensations of the things in the real world and not the things directly (Saunders *et al.*, 2007).

### 3.1.1.3 Interpretivism

Interpretivism suggests that the researcher needs to understand the differences between humans in our role as social actors (Saunders *et al.*, 2007). Much like how we interpret social roles of others according to our own set of meanings, interpretivism highlights the differences between different people who conduct research as each person has their own interpretation of the world (Saunders *et al.*, 2007). Interpretivism is the way in which humans make sense of the world and how this world affects us to make adjustment within our own meanings and actions (Saunders *et al.*, 2007).

### 3.1.2 Ontology

Saunders *et al.* (2009) states that ontology is a branch of philosophy concerned with nature of reality to a greater extent than epistemological considerations. It concerns the researcher's assumptions about the world and the degree that they hold a specific view. Ontology concerns how a phenomena exists, how it is organized and how it works. Ontology consists of objectivism and subjectivism.

In objectivism, '*social entities exist in reality external to social actors concerned with their existence*', whereas in subjectivism '*social phenomena are created from perceptions and consequent actions of those social actors concerned with their existence*' (Saunders *et al.*, 2009, p 110). The following table helps further explain these phenomena as identified by sociologists.

Table 3.1 Basic assumptions of Objectivism vs. Subjectivism (Hastings, 2005)

Positivism-Objectivism-Quantitative	Idealism-Subjectivism-Qualitative
Single Reality. It exists independent of the observer (subject-object split)	Multiple Realities. They are symbolically constructed and meaning is observer dependent
Reality is experienced through the senses, catalogued by the mind and measurable either directly or indirectly	Social reality is engaged through cognition and organized in memory
Researcher may engage the world in a value-neutral manner (objectivity)	Researcher engages the world in a value-laden manner (subjectively)
Knowledge may be built cumulatively following scientific canons emphasize observation, reliability in measurement and analysis and confirm or refute hypotheses logically derived from theory	Understanding is possible by dint of people's ability to exercise empathy
Theory is cumulative. It embodies the explanatory principles, empirical laws on how classes of events and processes work across time and space (universals). It allows us to predict how reality works	Knowledge is based on observation. Theory is situationally and historically specific to a given social context. A statement describes how an event or process works (particularistic)
Emphasis is explanation and control	Emphasis is discovery

The nature of this research is qualitative and subjective in order to observe, discover and understand multiple realities that may exist.

### **3.1.3 Axiology**

Axiology is a branch of philosophy that focuses on what roles the researcher's values plays in their research choices (Saunders *et al.*, 2009). The same research done by different researchers may have different results due to the fact that each person has different values and views which affect their judgement and as a result differentiate the outcome.

## **3.2 Research Approach**

Research approach emphasises how research is directed and consists of two approach types, deductive and inductive. In deductive approach, the researcher develops a theory and hypothesis and designs a research strategy to confirm or refute the hypothesis whereas in inductive approach, data is collected and the theory is developed as a result of the data analysis (Saunders *et al.*, 2009).

Hence, inductive approach has been chosen for this research because the author wanted to build a theory upon empirical findings in primary and secondary data, literature reviews, observation and interviews.

## **3.3 Research Strategy**

Different research strategies can be used for explanatory, exploratory and descriptive research Yin (2003 cited in Saunders *et al.*, 2009). In choosing a strategy over another, what is important is whether it is able to answer the research question(s) and meet the research's objectives or not and that no strategy is superior or inferior to any other (Saunders *et al.*, 2009). According to Saunders *et al.* (2009), the choice of strategy is led by multiple factors: research question(s), objectives, extent of existing knowledge, amount of available time and resources as well as researcher's own philosophical foundation. The different types of research strategies at researcher's disposal are as follows: survey, experiment, case study, action research, grounded theory, ethnography and archival research.

This research is based on mono-method because it employs one strategy: semi-structured interview with a qualitative nature. Research strategy associated with this research is survey strategy. Saunders *et al.* (2009) holds that structured observation, structured interviews where standardised questions are asked of all interviewees and questionnaire all belong to this strategy.

*'In semi-structured interviews the researcher will have a list of themes and questions to be covered, although these may vary from interview to interview.'* (Saunders *et al.*, 2009, p. 320). In other words, the researcher may omit some questions in particular interviews, depending on specific organisational context that is encountered in relation to the research topic (Saunders *et al.*, 2009). Saunders *et al.* (2009) argues that the order of questions may also be different depending on the flow of the conversation and further questions may be required to explore your research objectives and question(s) regarding the nature of events within particular organisations. This research will use semi-structured interviews as its primary data collection technique.

## **3.4 Research Method**

The two main types of research methods are quantitative and qualitative. These differ in both data collection and analysis and no method is better than the other. According to Saunders *et al.* (2009), qualitative (non-numerical) method is predominantly used for any

data collection technique (i.e., an interview) or data analysis procedure (i.e., data categorization) which generates or uses non-numerical (quantitative) data. Semi-structured interview produces qualitative data, which needs to be analysed qualitatively.

Table 3.2 Uses of different types of interview in each of the main research categories, Saunders *et al.*, (2009, p. 323)

	Exploratory	Descriptive	Explanatory
<b>Structured</b>		✓✓	✓
<b>Semi-structured</b>	✓		✓✓
<b>Unstructured</b>	✓✓		

✓✓ = more frequent, ✓ = less frequent.

For the purpose of this research, the author has chosen exploratory research. ‘*In an exploratory study, in-depth interviews can be very helpful to ‘find out what is happening [and] to seek new insights.’* (Robson, 2002, cited in Saunders *et al.*, 2009, p. 322).

Adams & Schvaneveldt (1991 cited in Saunders *et al.*, 2009) characterize exploratory research to be activities of an explorer or traveller. Saunders *et al.* (2009) asserts that its most important advantage is that it is flexible and adaptable to change and the researcher must be willing to change direction as a result of new insights that appear.

### 3.5 Data Collection

#### 3.5.1 Primary Data Collection

The primary data collection method was chosen to be semi-structured interviews. By nature, semi-structured interview is non-standardised, meaning that there is a list of theme(s) and questions to be covered which may vary from interview to interview (Saunders *et al.*, 2009). In other words, the interviewer could create a custom-made interview on the fly depending on the answers by omitting certain questions and going in depth into certain areas. This empowers the researcher to gain more insight into the research domain. Open-ended questions help respondents give answers their own way, Fink (2003, cited in Saunders *et al.*, 2009).

If the researcher no longer receives new information into the research realm, it means that they have reached the full range of ideas given by respondents and reached saturation (Saunders *et al.*, 2009). This is when researchers know they have enough information.

Gathering primary data in this research required interviews with people involved in SMEs (Small and Medium Enterprises). If an IT professional working in SME was available she/he were interviewed. For smaller organizations that did not have an IT professional, the person who made IT decisions was interviewed. Interviews took place separately with one respondent (participant) at a time. The following table displays all interview questions with their purpose and corresponding research question(s) to which they relate.

Table 3.3 Mapping between semi-structured interview questions, related research questions and their purpose

Interview question	Purpose	Linked research question(s)
What IT services do you use in your organization?	To get the list of IT services and establish which are important	Q1, Q2
How instrumental are these IT services to your business? Can your firm survive without them?	To establish the importance of IT services in their business	Q1, Q2
What medium do use to search for an IT service provider?	To learn where interviewees gather information about alternatives	Q1
How many alternatives do you need to find to make a good decision?	To learn how extensive of a search is performed	Q1, Q2
How important is it that the service is in or is being offered in Sweden?	To evaluate the importance of locally offered IT service	Q1
Have you ever used a decision-making method? What methods do you know of?	To assess the current knowledge of the decision-maker about choice, selection and decision-making methods	Q1
How do you make decisions? What is your mental process in detail?	To find out how they make decisions at a high level	Q1
How many people are involved in the decision making process?	To evaluate how the organization affects decision making process	Q1
What attributes are most important to you for an IT service provider?	To identify most important attributes of an IT service provider	Q2, Q1
Do these important attributes vary (differ) service-by-service or are they the same overall?	To assess whether above attributes are service-specific or universally valid	Q2, Q1
Pick 5 attributes for IT services from the list, rate them from 1 - 5	To compile/sort a list of attributes that are important for the organization	Q2
What attribute(s) are you willing to give up if the IT service provider offers service for free?	To establish what attributes may be given up by gaining free service	Q2, Q1

### 3.5.2 Secondary Data Collection

This research utilizes secondary data in order to gain a complete picture of the research domain and likewise to gain knowledge about what is already known in this field. Inductive approach utilizes both primary and secondary data to build a theory. The secondary data can help researchers by saving time and providing information that can be difficult to gather due to access or other limitations.

Saunders *et al.* (2009), emphasizes that the analysis of secondary data by reanalysing data gathered for some other purpose could provide a useful source from which to help answer the research question(s). They further explain that a vast amount of information can be collected through multiple channels including payroll details, copies of letters, meeting minutes, accounts of sales of services or goods, surveys, official statistics regarding social,

demographic and economic topics to name a few (Saunders *et al.*, 2009). This data may be raw or published summaries and includes three types: documentary, multiple-source and survey (Saunders *et al.*, 2009). The secondary data sources chosen for this research was as follows: journals, articles and reports. These were collected for analysis mainly through Jönköping University's online library, Google scholar and Diva.

### **3.5.3 Sampling**

There are two sampling techniques available to researchers: probability *or* representative sampling and non-probability *or* judgemental sampling (Saunders *et al.*, 2009). Judgemental sampling is also called purposive sampling because it enables the researcher to use their own judgement to select cases that will best facilitate answers to research question(s) (Saunders *et al.*, 2009). Saunders *et al.* (2009) stresses that this form of sampling is best used with very small samples and that subsequently this sampling method cannot be statistically representative of the total population. Non-probability purposive sampling method is acceptable for this research because the Swedish SMEs do not represent a large portion of Sweden's population and the purpose of this research *is not* to generalize its findings for the whole population.

Patton (2002, cited in Saunders *et al.*, 2009) suggests that the validity, understanding and insights that the researcher will gain from collected data will have more to do with data collection and analysis skills than the size of research sample. Therefore, the sample size was chosen to be saturation method.

Saunders *et al.* (2009) maintains that "typical case sampling" is typically used to provide an illustrative profile using a representative case, in other words an illustration of what is 'typical' to the readers of research report who may be unfamiliar with the subject matter. Therefore, typical case sampling with focus as illustrative was chosen as the purposive sampling method because the author tries to demonstrate the typical decision making process in Swedish SMEs. This process may be specific to Sweden due to its business and commerce laws or regulations. Interviews were conducted in English and notes were taken during interviews. The interviews were recorded and transcribed.

## **3.6 Data Analysis**

According to Saunders *et al.* (2009), the inductive approach to qualitative analysis is to collect data and then explore them to see which themes or issues can be followed up and concentrated on. Due to the nature of inductive approach, there is no standardised procedure for analysing qualitative data and analysis method will use the less structured interpretivist view (Saunders *et al.*, 2009).

The data analysis was executed according to the decision making theories discussed in chapter 2. Secondary data analysis contributed towards finding the most important attributes of an IT service provider and elements upon which decision makers make their judgement.

## **3.7 Research Quality**

Credibility is the question of how the researcher knows her/his findings can withstand other researcher's scrutiny. Sanders *et al.* (2009) asserts that it is impossible to know if we have the right answer, all we can do is to minimize the possibility of getting the answer wrong.

### **3.7.1 Reliability**

Saunders *et al.* (2009) affirms that reliability refers to the extent to which the researcher's data collection methods or analysis procedures will result in consistent findings. This can be evaluated by asking the following three questions Easterby-Smith, Thorpe and Jackson (2008, cited in Saunders *et al.*, 2009):

1. Will the measures yield the same results on other occasions?
2. Will similar observations be reached by other observers?
3. Is there transparency in how sense was made from raw data?

Saunders *et al.* (2009) identifies four threats to reliability:

1. subject or participant error
2. subject or participant bias
3. observer error
4. observer bias

Saunders *et al.* (2009) explains that subject bias could arise when interviewees say what they think their bosses want them to say and that this is a problem with authoritarian management style. This is not applicable in this research because Swedish SMEs are by nature flat hierarchy organizations that do not typically have any reason to falsify answers. Regarding researcher bias, Johnson (1997) asserts that the problem with qualitative research is that the researchers find what they want to find then write up those results. Since qualitative research is open ended and less structured than quantitative research, the 'researcher bias' problem is often an issue due to the exploratory nature of qualitative research (Johnson, 1997).

Johnson (1997) states that main strategy used to understand researcher bias is called *reflexivity*, meaning that the researcher actively engages in critical self-reflection about his or her potential biases and predispositions, which affect the research process and conclusions. Reflexivity helps researchers become self-aware and so they could monitor and attempt to control their biases (Johnson, 1997)

Observer bias and error were minimized since only one observer or researcher had undertaken the semi-structured interviews. Therefore, there was only one way to ask questions and to interpret the replies whereas multiple observers and researchers would each have had their own ways of interpreting things. This could have skewed the interpretive findings.

### **3.7.2 Data Validity**

'Validity is concerned with whether the findings are really about what they appear to be about.' (Saunders *et al.*, 2009, p. 157). Threats to validity declared by Saunders *et al.* (2009) are as follows:

*History:* If the researcher collects data on product information and this coincides with a time when the product in question is being scrutinized, the data collected may be unintelligible because this data does not reflect the true nature of the product.

*Testing:* The participants may change their answers if they believe the results of the research may be disadvantageous to them in some way.

*Instrumentation:* The rules may have changed from the beginning of the research.

*Mortality*: Participant dropout from studies. This mostly affects researchers who undertake a long-period research study.

*Maturation*: Occurrence of certain events over a period may change how the participants act (i.e., change in management style over a year)

*Ambiguity about casual direction*: Ambiguity about cause and effect where it is hard to know if something has happened as a result of another thing or the latter has happened as a result of the first one.

Johnson explains, ‘*While descriptive validity refers to accuracy in reporting the facts, interpretive validity requires developing a window into the minds of the people being studied.*’ (Johnson, 1997, p. 285). Johnson (1997) further explains that accurate interpretive validity means that the researcher gets inside the heads of the participants and that he/she looks at the world through participant’s eyes. In this approach, adds Johnson (1997) the researcher can understand things from the participants’ perspectives and viewpoints.

Participant feedback, also called “member checking” is one of the most important strategies in achieving interpretive validity (Johnson, 1997). Participant feedback works by means of the researcher sharing his/her interpretations of participants’ viewpoints with participants themselves, in order to clear up any confusion or misunderstandings (Johnson, 1997).

In order to ensure validity in the study, the author conducted interviews without giving prior information on the questions or decision-making methods to the participants. The short period of research minimized *mortality*, *instrumentation* and *maturation* threats. Since the organizations were unaffected by the research findings, the threat of *testing* was minimized. Threat of *history* was not applicable because the occurrence of decision making on a product or service at the time of the interview was beneficiary to the research since the participant could readily relate to the interview questions.

### **3.7.3 Generalizability**

Generalizability, also referred to as *external validity* is the extent to which the research results are generalizable (Saunders *et al.*, 2009). Saunders *et al.* (2009) persists that generalizability means whether the researcher’s findings may be applicable to other research settings and organizations. This way the research will not be able to produce a theory that is generalizable to all populations; the authors’ task will simply be to try and explain what is going on in his/her specific research setting (Saunders *et al.*, 2009). As long as the researcher does not claim that her/his results, conclusions or theory are generalizable, there is no problem.

The purpose of this research *was not* to generalize its findings for the whole population. The choice of typical case sampling helped demonstrate the typical decision-making processes in Swedish SMEs. Moreover, the selection of companies chosen for this research helped gain overall information on Swedish SMEs because each company works in a different sector and could contribute towards a holistic view on Swedish SMEs.

Therefore, typical case sampling with focus as illustrative was chosen as the purposive sampling method because the author tries to demonstrate the typical decision making process in Swedish SMEs.

## 4 Empirical Findings (Results)

This section presents a summary of empirical studies undertaken during this research through semi-structured interviews based on the theories and secondary data research. Insight into companies is given through a company summary.

Interviews were conducted in person or through Skype or Viber. Some words are added to the replies in parenthesis “( )” for clarification by the author. The rest of the sentences are summarized sentences of the participants. Some of the questions are answered by other questions. Some answers may be contradictory and they are left alone in order to preserve the authenticity of the interviewees’ words.

Once the list of attributes for IT services was extracted, aggregated and sorted, the interviewees were contacted again and asked to evaluate the aggregated list of attributes and prioritize them from 1 to 5, 1 being most important. This was done in order to evaluate the priority and importance of *all* IT service attributes for each company. Table below displays important information about the interviews.

Table 4.1 Interview details

Company	First Chance HB	SEAB Synergy AB	North Carpet AB
Industry	Web / mobile app development	Waste management	Carpet wholesaler / importer
Interviewee's Name	Wishes to remain anonymous, male	Mr. Mohammad Beheshti	Wishes to remain anonymous, male
Position	IT responsible co-owner	IT manager	IT responsible
Place of interview	Helsinki, Finland	Stockholm, Sweden	Stockholm, Sweden
Form of interview	Skype/Viber	Face to face	Face to face

### 4.1 Interview with First Chance HB

First Chance HB is a partnership company established by two individuals in 2013. The company operates in Jönköping, Sweden in the field of web design, web development, mobile application development and digital media (First Chance, 2014). The people who grounded First Chance had previously worked in digital media technologies since 2008 and had won prizes for their e-commerce platform (MySellr) which was based on Facebook (First Chance, 2014). Their cloud-based platform FirstApp offers mobile applications to customers to build their brand or integrate with their customers (First Chance, 2014).

The interview took place on Skype and Viber since the IT responsible co-owner who wanted to remain anonymous is studying abroad. The interviewee is the web designer, web developer and programmer. He has been in the IT industry for over 7 years, has created numerous e-commerce websites and is up-to-date with latest web technologies.

*1. What IT services do you use in your organization?*

We used to use google mail for business. We also used google drive and google docs because they integrated well with it. Google mail (Gmail + domain name) used to be free for your own domain name for up to 10 users.

Now outlook.com allows us to create as many accounts as we want with our own domain. We can use our own domain name with it and it looks very professional when you have your own @domainname.com email. That is the only reason we switched. Why pay when you do not have to? It is not worth paying \$50 per user for corporate Gmail. We are still using google docs though.

For file-sharing service, we use old-fashioned file email attachments because it is only two of us and we rely on email for communication. We do not use Dropbox or any other file-storage tools because we are a small company with no organizational structure with certain protocols to follow.

We use Skype and email for client communications and between us in the company. Most of the communication with clients is done through my colleague, we ask clients not to use specific proprietary software like ZenDesk so we can be compatible with them.

*2. How instrumental (useful) are these IT services to your business? Can your company survive without them?*

It cannot, I do not think so. If anything, it will diminish revenue. Since it is only two people in the company it may not have a big effect on the organization but the main useful feature that I see is the historical data that I can go back and find what I need. Regarding email, it looks very professional when you have your own @domainname.com email, that is very good thing for branding and company-image. Since we do web development, I do not think we can survive and since we advise people for their web technologies, we must have a solid web presence.

*3. What medium do use to search for an IT service provider?*

The first thing we always do is of course research online, what bloggers say, the people in the industry with a lot of experience. Word of mouth is very effective, if a knowledgeable person suggests something that is very effective and I would check it out right away, however if a friend, colleague, partner an IT oriented person suggests something then I would definitely change my opinion quite a bit. I make the final choice by myself depending on the features but if someone suggests something, I will go directly check it out rather than seeing what shows up on google search. Word of mouth has bigger impact for me than google search.

*4. How many alternatives do you need to find to make a good decision?*

I would say three at most; I look at the top three from google and then make a decision from those 3. Two is the minimum. Even if I find the first one to look perfect, I would still search for alternatives just to see what else might be out there and how it competes with the rest of the alternatives so I would not make the choice right away. Especially if it is a long-term service like email because we cannot just pick it and later we find out that we have to change our mail servers and domain names and transfer emails. That is why I was not happy when google took away their free corporate mail service since everyone was used to the system.

5. *How important is it that the service is in or is being offered in Sweden?*

Location also matters; it would very positive if the servers are in Sweden, since our clients are Swedish and that would increase latency time. However, if it is a lot more expensive in Sweden so we chose not to host the service here.

6. *Have you ever used a decision-making method? What methods do you know of?*

I personally have not used any decision making methods. I might have unintentionally, but I do not apply any methods of decision making or rather, I do not know any methods of DM.

7. *How do you make decisions? What is your mental process in detail?*

The first thing is, I judge by the branding of the service or the company or the website. The first thing that catches my attention, I see hundreds of pages a day, if it does not catch my attention within 2-3 seconds or it looks like a bad design I just quit that page and I do not go back. Personally, what is most important to me is the "first look", the branding of the company or services. From logo to colours to how the app looks. Then the second thing is once they have my attention I look through the features (attributes) that I was initially looking for, to see whether they have those features. Then if everything is fine, I would look for other alternatives just to check if there is another better alternative out there. I might be missing out on some features that I did not know I needed, or there could be a free alternative to the service that I found. Basically, I am looking for other alternatives that offer better value after I am happy with the first solution. Otherwise, if on first site the branding is not satisfactory, I quit it and keep searching for another solution. This is online services we are talking about, just to clarify.

If it was physical local IT service (like IT helpdesk), then I would just pick the first things because it is hard to find competitors (alternatives). I pick the first that I am satisfied with and I go with it. Because in that case it is time and location that matters.

Time and location do not exist on the web because it is just a click away, you spend 2 seconds typing in the search bar and search and you find it because everything is online.

8. *How many people are involved in the decision making process?*

Since I am the IT responsible person, it is only me. I would say 1/50<sup>th</sup> of decisions are overturned because I might have overlooked something (IT wise). When it comes to finances, taxes, marketing and spending all that I do not bother with (decision making for them).

9. *What attributes are most important to you for an IT service provider?*

I guess value (for money) is a combination of everything so I am not going to say that. Quality/features first, then it would be support and then it would be price.

10. *Do these important attributes vary (differ) service-by-service or are they the same overall?*

I think they are the same overall. This is literally scan of my brain: all these attributes have the same weight, well no, quality/features carries slightly more weight than the one below it (support) and price has the lowest weight however they are very close to each other. So let me give you an example:

For price, I would multiply (the score) by 0.8, support would be multiplied by 0.9 and features/quality would be multiplied by 1, then you add them all up. Then the one (alternative) with the highest number (score) is the winner (chosen alternative). This is how I would see things.

If there is an IT service (email) that offers great quality and features but it costs something, then there is outlook.com, which is not integrated with google docs, it is not as popular but it is free, then of course I would pick outlook.

However, if it were the same exact thing but one had better support, then I would pick that.

*11. What attribute(s) are you willing to give up if the IT service provider offers its service for free?*

If I have a free solution but it is not good, I would never pick it over a paid solution that offers support and quality. However, if I were offered something free, I would give up support.

We have webservers in Germany, which are very cheap, but the catch is that they are unmanaged servers, so you need to install software yourself, keep them up to date and so on. They do not help you much but I am willing to put the time and fix things up by myself.

I am willing to give up support for things that I know how to manage or support myself, it is just time consuming. However, if it is something like an app or a service that I do not know about, I am not willing to give up the support for price.

This is dependent on the price. If the price difference is small then I would pay for the support.

*12. Pick 5 attribute for IT services from the list below, rate them from 1 to 5 (where 1 is very important and 5 is less important), add your own attribute(s) if you do not see them.*

Price / Cost	Support / Customer service
Value for money	Quick response
Security / Trustworthiness	User Friendly (Application/IT helpdesk)
Quality	Ease of use / Simplicity (Application)
Availability	Popularity (provider/app) / Brand (Reputation)
Compatibility	Prior knowledge (about provider or program)
Integrateable (with current systems)	Features
Multiplatform integration	Location (in Sweden)
Competent	Attractive (Website)

Here is my list of top five attributes sorted by importance:

1. User friendly (Application/IT helpdesk)
2. Prior knowledge (about provider or program)
3. Attractive (Website)
4. Support/Customer Service
5. Value for money

## **4.2 Interview with SEAB Synergy AB**

SEAB Synergy AB is an innovative company that was established in 2013. It operates within waste management sector, specifically waste to energy conversion. SEAB Synergy offers solutions that enable management of hydrocarbon waste in a legally compliant and sustainable manner (SEAB, 2014). The organization has recently opened an office in Erbil - Iraq. SEAB Synergy employs around 50 people worldwide and its headquarters is located in Stockholm, Sweden.

The interview took place in SEAB Synergy AB office in Stockholm, Sweden. The interviewee is the IT manager of company, Mr. Mohammad Beheshti. Mr. Beheshti had graduated from JIBS University with a Master's degree in IT management in 2010 and received his SAP ERP certificate in 2012. At the time of the interview, he had already been working for SEAB Synergy for around 3 months, had already created their website and was in the process of implementing their acquired SAP ERP solution on a co-located server in Stockholm.

1. *What IT services do you use in your organization?*

IT services that we use vary: 1) Web related (website, domain and hosting) 2) ERP program and 3) Server colocation. Since we are an SME, we do not use many IT services. Our main IT services are Website and ERP system. We have a dedicated server in a server colocation area in Stockholm with services offered such as internet, electricity, cooling etc. Taking care of the server, installation and backup is our own responsibility

2. *How instrumental (useful) are these IT services to your business? Can your company survive without them?*

Of course, these IT services are fundamental for our business regarding the three mentioned services have synergy together and we cannot just use one of them. We may be able to use just the website on its own. The server co-location and ERP system are related to each other and are fundamental for our ongoing projects.

3. *What medium do use to search for an IT service provider?*

In our company when we normally want to take an IT service, I as the IT manager am responsible for that. We discuss together with my other colleagues and I will ask my networks and internet about which IT service suits our needs and business best.

4. *How many alternatives do you need to find to make a good decision?*

When I search for example for hosting companies, I come with 2 or 3 choices through my network or experts, then I evaluate them and finally choose one. For ERP suite or project management system, 4-5 alternatives is better option for us so it depends on type of the service.

5. *How important is it that the service is in or is being offered in Sweden?*

Very important. About our web hosting and server, security is our main issue because we want to be sure that our data is stored totally secure in Sweden. We spend quite a lot to have our own dedicated server in Sweden. We also want to have physical access to the server area that I visited a few nights ago when I had access difficulties. We have a dedicated server that we are responsible of upkeep. But even if we had decided to get a VPS (virtual private server), we would have still chosen Sweden due to tax and security issues. It is a lot easier to work with a Swedish company that has F-skatt (tax registration number) and we can rely on the people who are local here more (in Stockholm) than people who we can never meet and are in another country.

This is how we can feel confident in the service, that if the company is based in Sweden and we can reach them any time. In addition, that we feel that our data is not going out of Sweden, "that" gives us a sense of security. We had an opportunity to get the "on-demand" ERP which is web-based and hosted in Germany, but we decided to have our own server in Sweden through "on premise" ERP and it is more hassle for us (for installation, configuration and management of server and ERP program) but for data security it is worth the trouble.

6. *Have you ever used a decision-making method? What methods do you know of?*

Decision-making that we use here is mainly based on discussion. As an IT manager, I am responsible to research about everything about the service that we are going to acquire. If we want to buy an ERP suit or project management system then I am responsible to research all information about that and find out which one suits our requirements best. Moreover, which alternatives we could take according to our budget.

For example, I find 4 or 5 alternatives, I will list all of them (attributes), compare them and discuss with my manager who is not knowledgeable about technical IT. We discuss advantages, disadvantages and cost then in the end we come to an agreement together about what to choose as the best alternative.

I remember in academic courses we had something like weighting methods but here we are not going that deep into DM.

7. *How do you make decisions? What is your mental process in detail?*

This can be varied for different IT services. For some IT services that we use we write a list of important characteristics: price, security, compatibility and user friendliness.

When we wanted to make decisions for example about hosting, most important part (attribute) was customer service. For ERP system what was most popular and user friendly was most important attribute because we want to be able to employ someone in the future who is experienced in this popular ERP system and a smaller or less known program has slimmer chance of finding the right person.

I would like to add that different IT services require different decision-making methods.

As I mentioned in (Answer 6), we discuss it at the higher levels and we come up with the best alternative. Regarding DM, we probably have 2 phases. First phase is the technical phase that I am responsible to evaluate the service technically. When I find out the different alternatives, I list and compare them based on different characteristics (attributes) that we are looking for and then discuss with the manager. Then it is my job to explain why it is the best solution.

8. *How many people are involved in the decision making process?*

I get tips on what (attributes) are important for the firm, then technical part is what I do.

The number of people in discussion is up to four people because we want to discuss about their requirements as well, but regarding IT, it is only me. If we are going to use a program that everyone is going to be using, we must all discuss, but for web hosting only I make decisions.

9. *What attributes are most important to you for an IT service provider?*

It differs between services; in general, cost/price of Service is one of the most important attributes. Among all we look for price, user-friendliness, security, how popular the program/provider is, how much knowledge we have about them, how compatible is this service with our existing systems.

Specific for ERP: price is very important because we are a new company and at the beginning of our journey, how familiar as an IT manager I am with that program is important. Because then we do not need costly external training.

10. Do these important attributes vary (differ) service-by-service or are they the same overall?  
 Answered in Answer 9.

11. What attribute(s) are you willing to give up if the IT service provider offers its service for free?  
 Location and support.

12. Pick 5 attribute for IT services from the list below, rate them from 1 to 5 (where 1 is very important and 5 is less important), add your own attribute(s) if you do not see them.

Price / Cost Value for money Security / Trustworthiness Quality Availability Compatibility Integrateable (with current systems) Multiplatform integration Competent	Support / Customer service Quick response User Friendly (Application/IT helpdesk) Ease of use / Simplicity (Application) Popularity (provider/app) / Brand (Reputation) Prior knowledge (about provider or program) Features Location (in Sweden) Attractive (Website)
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The list is as follows:

1. Security/Trustworthiness
2. Price/Cost
3. Easy to use/Simplicity (Application)
4. Support/Customer Service
5. Location (in Sweden)

### 4.3 Interview with North Carpet AB

North Carpet AB operates in the field of import and wholesale of rugs/carpets from all over the world and was established in 1996. North Carpet AB designs and manufactures carpets and also purchases carpets from other designers. The company works closely with other carpet shops, retailers and interior designers in Sweden.

The interview took place in North Carpet AB office in Stockholm, Sweden. The interviewee is the person responsible for the company's IT needs and wishes to remain anonymous. He has had over 10 years' experience working in the field of IT support and in more recent years in corporate IT. The IT responsible has been working closely with North Carpet AB for the past 3 months and has a good idea about the company's IT related requirements. At the time of the interview, the company was in the process of choosing an inventory management solution. This solution may have been cloud based, hybrid (client software on computer working with cloud) or computer based.

1. What IT services do you use in your organization?

We have a variety of already in use IT services or needs for future: 1) Web related (website, domain and hosting), 2) Inventory management solution, 3) Online storage, 4) IT helpdesk, 5) Email Box service. Currently we are looking for inventory management solution that meets our needs and requirements.

2. *How instrumental (useful) are these IT services to your business? Can your company survive without them?*

Well the organization can also do its business without them but with difficulty. We still utilize a fax machine because some of our customers in other countries work traditionally. We can speed up our work greatly using IT services. Currently we are doing our inventory management with Excel and by writing on paper. This introduces human error and is time-consuming to enter into computer.

3. *What medium do use to search for an IT service provider?*

Primarily internet, but also asking colleagues who may have had experience in the same field. If they have chosen a service or an item, it may have been for a good reason. We would definitely consider that. We also take part in furniture Expo's and we may be offered a service there that we will consider.

4. *How many alternatives do you need to find to make a good decision?*

It depends on the decision. If the decision has deep impact and is long-term, then we may spend more time and effort to find more alternatives. Generally speaking, about 2-3 (alternatives) for lower impact services and 4-7 for higher impact services such as inventory management solution.

5. *How important is it that the service is in or is being offered in Sweden?*

Very important. We wanted to be in touch with a local web design and hosting provider so they would be just a phone call away. As for IT helpdesk, we require someone to come here to resolve our software and hardware issues, so they must be based in Stockholm and able to come in short notice. For inventory management solution, we would like it to integrate with sales so preferably it should be Swedish software. As for the online storage solution, we would like to have the files in Sweden's borders. However, we understand that this solution may not be possible because major suppliers of online storage are based mainly in USA: Google Drive, Microsoft SkyDrive, Amazon AWS S3 and Dropbox, which also uses Amazon AWS for its storage. We do not save our sensitive information on online storage; we use offline storage for that.

6. *Have you ever used a decision-making method? What methods do you know of?*

The main decision making method here is that we discuss it with other people who may have had experienced in the field. If the service/product is offered locally, we talk to them in person and try to make decision according to that information.

We may have used specific method but I am not aware of it.

7. *How do you make decisions? What is your mental process in detail?*

First, I go online and try to learn more about the field of the service. As for the case of inventory management solution, I went online and searched via google to find the market trends. I found out that for example there were traditional software, cloud-based apps and simpler Android/iPhone based software available which worked with cloud-based services. Since we do not require a lot of complicated tasks but what is important for us is integration with barcode readers that have their own (on-board) memory, I searched for that software. I downloaded 7 different PC software, 5 different Android software and signed up to 3 different cloud-based services to try them so I could find out what features (attributes) they can offer.

After trying them, I would then write a note of what criteria (attributes) the software/service (alternative) contains and then in the end discuss with colleagues at North

Carpet. I needed several discussions to precisely capture the requirements of the company. For us, simplicity and ability to integrate with wireless barcode readers is key.

8. *How many people are involved in the decision making process?*

After discussions to capture the exact requirements of the company, I find all criteria (attributes) about different solutions (alternatives) and write a list. Those that cannot fulfil our needs are taken out (omitted). The remaining ones are tested and if they can be used for our needs, they will be discussed with two other people in the company. When we come to a mutual agreement, we will decide. I am responsible to get the IT information about the criteria (attributes). Sometimes, the company does not know that something can be done in another way. It is my responsibility to inform them about it and present them with advantages of the new way.

9. *What attributes are most important to you for an IT service provider?*

It depends on the service. For online backup data security, availability and multi-platform integration such as PC, iPad, iPhone, Android are the most important. For web hosting, being in Sweden (location) and support are the most important. As for IT helpdesk, what is important is (that it is) a Swedish company with F-skatt (tax registration number), ability to respond quickly and trustworthiness are important because they have access to our (possibly sensitive) company information. For inventory management solution; simplicity, integration with wireless barcode readers and meeting our specific business needs to a high degree is what is important.

10. *Do these important attributes vary (differ) service-by-service or are they the same overall?*

Yes, already answered in 9.

11. *What attribute(s) are you willing to give up if the IT service provider offers its service for free?*

We are willing to give up on the features or support if the service is provided free of charge, if I as the IT responsible can offer support instead.

12. *Pick 5 attribute for IT services from the list below, rate them from 1 to 5 (where 1 is very important and 5 is less important), add your own attribute(s) if you do not see them.*

Price / Cost	Support / Customer service
Value for money	Quick response
Security / Trustworthiness	User Friendly (Application/IT helpdesk)
Quality	Ease of use / Simplicity (Application)
Availability	Popularity (provider/app) / Brand (Reputation)
Compatibility	Prior knowledge (about provider or program)
Integrateable (with current systems)	Features
Multiplatform integration	Location (in Sweden)
Competent	Attractive (Website)

I believe this list represents our organization's top five priorities:

1. Security/Trustworthiness
2. Ease of use/Simplicity (Application)
3. Multiplatform integration
4. Location (in Sweden)
5. Quick response

## 4.4 Secondary data

Several authors have suggested their own determinants of service quality:

Parasuraman, Berry & Zeithaml (1985, cited in Johnston, 1995) delivered a list of ten determinants of service quality resulting from group studies with customers and service providers: access, competence, communication, courtesy, credibility, responsiveness, reliability, security, tangibles and understanding.

Five dimensions of service quality used by Parasuraman *et al.*, and Zeithaml, Parasuraman & Berry (1988, 1990, cited in Johnston, 1995) are: tangibles, reliability, responsiveness, assurance and empathy. Later research by Johnston and Silvestro (1990, cited in Johnston, 1995) suggested a refined list: access, appearance/aesthetics, availability, comfort, cleanliness/tidiness, competence, courtesy, communication, friendliness, reliability, responsiveness and security. Walker (1990, cited in Johnston, 1995) advocates product reliability, good personal service (staff attitude), knowledge and skills as key determinants.

However, most of these dimensions are relative to products quality *not* service quality. Grönroos (1990, cited in Johnston, 1995) suggests that there are six criteria for perceived good service quality: attitude and behaviours, professionalism and skills, accessibility and flexibility, reliability and trustworthiness, recovery, reputation and credibility. Albrecht and Zemke (1985, cited in Johnston, 1995) advocate care and concern, spontaneity, problem solving and recovery for service quality.

The key issue is that the work on service quality determinants does not distinguish between effects of determinants on creation of satisfaction or dissatisfaction. *‘Consumers judge products on a limited set of attributes, some of which are relatively important in determining satisfaction, while others are not critical to consumer satisfaction but are related to dissatisfaction when performance on them is unsatisfactory.’* (Swan and Combs, 1976 cited in Johnston, 1995, p. 56).

Johnston (1995) characterizes classification of satisfiers and dissatisfiers of service for a bank as following: attractiveness (helpfulness), responsiveness, care, availability, reliability, integrity, friendliness, courtesy, communication, competence, functionality, commitment, access, flexibility, aesthetics, cleanliness (tidiness), comfort, security. Yang and Fang (2004) identifies 16 quality dimensions and 52 sub-dimensions (items) in their research of customer perceived critical dimensions of online service quality:

Table 4.2 Service quality dimensions and items identified (Yang and Fang, 2004)

Dimension	Hybrid item <sup>a</sup>	Internet-specific item
<b>Responsiveness</b>	Prompt response to phone calls Quick order execution Prompt order confirmation Prompt services (others)	Prompt response to e-mails
<b>Reliability</b>	Accurate order fulfilment Accurate record Accurate quote Accuracy in billing Accurate calculation of commissions Keep service promise Keep promotion promise	
<b>Credibility</b>	Confidence Company reputation	

<b>Competence</b>	Ability to solve problems Knowledge to answer questions Research capacity Quickly solve problem	
<b>Access</b>	Phone access Physical branch access	Web site accessibility E-mail access
<b>Courtesy</b>	Politeness Care and friendliness of contact personnel	
<b>Continue improvement</b>	Service improvement	System improvement Web site improvement
<b>Communication</b>	Prompt warning (e.g. account liquidation and restrictions) Prompt notification (e.g. margin requirement changes) Old records	
<b>Service portfolio</b>	Research reports Investment tools	
<b>Content</b>	Information availability (market and services) Information clarity Information accuracy	
<b>Timeliness</b>		Account update Quote update
<b>Security</b>	Information privacy Customer protection Trade hold-up Fund hold-up	Log off due to time-out Lock-out from service
<b>Aesthetic</b>		Attractive of Web sites
<b>Ease of use</b>		Easy navigation Easy use Effective navigation Functionality Speed
<b>System reliability</b>		System shutdown or failures System error
<b>System flexibility</b>		Compatibility (with some operation systems)

Note: <sup>a</sup> Items that are applicable to services over both traditional and Internet channels

The following table displays attributes for IT service that were stated in the interviews, according to each company.

Table 4.3 List of IT service attributes that are important for interviewed companies

	<b>First Chance HB</b>	<b>SEAB Synergy AB</b>	<b>North Carpet AB</b>
<b>List of Attributes</b>	1. Value for money 2. Support 3. Price 4. Quality/features 5. Attractive website 6. Brand 7. Competent 8. Location (in Sweden)	1. Cost/price 2. User-friendliness 3. Security 4. Provider/program popularity 5. Prior knowledge about provider/service 6. Compatibility 7. Customer service 8. Location (in Sweden)	1. Simplicity 2. Ease of use 3. Hardware-integration 4. Security 5. Availability 6. Multiplatform 7. Support 8. Trustworthiness 9. Quick response 10. Location (Sweden)

## **5 Analysis**

The basis of analysis in this chapter is to use theories mentioned in theoretical frameworks chapter to try to explain the findings from the three semi-structured interviews. In addition, the secondary data findings in last chapter will be used to evaluate the outcome of the interviews. Above information will be inductively analysed to discover themes that may be generated through utilization of empirical findings. Since only one of three people interviewed wishes to be recognized, in order to refer to each representative we will call each company representative as the acronym of their organization. First Chance HB will henceforth be called FCHB, SEAB Synergy AB called SSAB and North Carpet AB called NCAB.

### **5.1 IT services**

The interviews helped gain an insight into what services are in use by the Swedish SMEs. While this thesis' sample size cannot be representative of all Swedish SMEs, it can shed some light on what services are most popular within this sector. FCHB and SSAB claimed that IT services were fundamental to their organizations. NCAB claimed that while lack of IT services does not cripple the organization, it would make things tough because traditional means of doing business can introduce human error. We can therefore consider that IT service selection is an important organizational task because it affects how the entire organization operates.

FCHB stated that Google mail services were utilized in connection with Google drive and docs, but was later abandoned due to introduction of costly corporate email. The main idea here was to utilize the cheapest (free) service without incurring extra cost for something that could be attained elsewhere free of charge. Loyalty to a particular service provider does not play a role when businesses strive for minimizing costs, even if it offers better integration. The interviewee characterises this by saying "Why pay when you do not have to?".

This is logical because smaller organizations at the start of their business need to bootstrap in order to save resources (money) that could be used in where free service is not attainable. Hart *et al.* (1997); Greene *et al.* (1999) have emphasized that new ventures do not own or control resources, thus it is important for the entrepreneur(s) to leverage human and social resources to acquire and build organizational, physical and financial resources (cited in Harrison, Mason & Girling, 2004). Both SSAB and FCHB are newly established companies (2013) and it is apparent that cost is a major deciding factor in their decision-making. Furthermore, SSAB had acquired SAP as the selected ERP solution to the organization's needs. Since Mr. Beheshti is knowledgeable at SAP ERP, this has played a role in the selection because costly implementation and training can be avoided, thus saving the newly established company from spending money.

When asked what attributes (functions) they were willing to give up if the service provider offered free service, the common answer was "support". Because support means someone has to spend their time and effort to help others achieve the expected results from a service or application. One of the popular business models for internet based services is the lack of support for free service and added functionality and 24/7 support for paying customers. In most cases, getting support for free services means that users must rely on blogs and bulletin boards with people who share the same interests who may or may not be able to give them the correct information. For these reasons, FCHB replied that he would be

willing to give up support on things that he knows how to manage himself and that he is not willing to give it up for things unbeknownst to him.

## 5.2 Attributes

The difficulty with evaluating alternatives is finding information about its attributes and giving each attributes a rating. There is no standard system of rating a service or cloud-app and each website its own set of rules in how an IT service is evaluated. There is no reliable way to evaluate a local IT service (such as IT helpdesk) or assess the degree of truth in what the service providers advertise before signing up with their service.

Certain aspects (attributes) of IT providers (alternatives) are up for debate while others are just an accident away. Security claims by cloud storage giant Dropbox may hold truth up to the point when they leave their security off and disable authentication where anyone could log into any Dropbox account using any password (Bott, 2011). Bugs, hacks and simple human errors can jeopardize security on IT services that claim to have high security. Therefore, it is difficult to assess security claims for IT services.

The reason “value for money” was not combined with “price/cost” is because the two are similar yet different. While value for money may be interpreted as being cheap, it is not. Value for money means that the price you pay for a service is justified by the quality and the utility of that service for you. Price/cost is always tried to be minimized, but the method that value for money can be maximized is either to increase its quality or utility at the same cost, or lowering the cost with the same level of quality or utility as before.

When participants were asked for top five attributes for their organizations, two out of three mentioned “security”, “ease of use” and “location” to be major determinants in their decision-making.

In table 4.2, we read about the research of Yang and Fang (2004) that identified 16 quality dimensions for service quality. Table 4.3 contains the list of all attributes for IT services that were extracted from the interviews, sorted by respondent. These attributes (features) were then combined into a list and duplicated were removed. Next, similar words were combined into same word. The words “trustworthiness” and “security” were combined into “security”, the words “customer service” and “support” were combined into “support” and the words “simplicity” and “ease of use” were combined into “ease of use”. The consolidated list of key attributes discovered in the interviews is as follows:

Table 5.1 Consolidated list of IT service attributes important for interviewed companies

<ul style="list-style-type: none"> <li>• Price/cost</li> <li>• Value for money</li> <li>• Security</li> <li>• Quality</li> <li>• Availability</li> <li>• Compatibility</li> <li>• Support</li> <li>• Features</li> <li>• Competent</li> <li>• Attractive (Website)</li> </ul>	<ul style="list-style-type: none"> <li>• Quick response (IT helpdesk)</li> <li>• User friendly</li> <li>• Ease of use (Application)</li> <li>• Brand (Reputation)</li> <li>• Popularity (Application)</li> <li>• Prior knowledge</li> <li>• Location (in Sweden)</li> <li>• Integrateable (with current systems)</li> <li>• Multiplatform (Application)</li> </ul>
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These attributes are then cross-referenced with the 16 attributes found in table 4.2 by Yang and Fang (2004) to identify recurring attributes (with arrows) and illustrate new attributes from this research.

Table 5.2 Cross-referenced list of service quality dimensions and IT service attributes

IT service attributes (Banuazizi Fard)	Service quality dimensions (Yang & Fang, 2004)
Quick response (IT helpdesk)	Responsiveness (quick to respond to contact)
Price/Cost	Reliability (accuracy, keep promise)
Value for money	Credibility (confidence, reputation)
Brand (Reputation)	Competence (quick problem solving, knowledgeable)
Competent	Accessibility (multiple communication channels)
Availability	Courtesy (politeness, friendliness and care)
Compatibility	Continued improvement (system/website updates)
User friendly	Communication (prompt warning/notification)
Quality	Service portfolio (Research reports)
Support	Content (information availability, clarity & accuracy)
Features	Timeliness (Account updates)
Popularity (Application)	Security (Information privacy, customer protection)
Prior knowledge	Aesthetic (attractiveness of websites)
Location (in Sweden)	Ease of use (Easy/effective navigation, speed)
Security	System reliability (System shutdown or error)
Attractive (Website)	System flexibility (Compatibility with OS/platforms)
Ease of use (Application)	
Integrateable (with current Systems)	
Multiplatform (Application)	

### 5.3 Alternatives

#### Search

One of the initial steps in decision-making is searching for alternatives. Depth and scope of search along with chosen decision-making method have direct effect on the outcome of decision-making. For example, one of the implications of Satisficing heuristic (method) is that the first processed alternative that satisfies the search criteria is picked as the chosen alternative (Payne *et al.*, 1993).

Since depth and scope of search has a direct effect on the outcome of decision-making process, one could think that everyone would naturally be inclined to search for as many alternatives as they can find and widen the scope of their search. However, time and attention constraints limit the scope and depth of search for alternatives.

## **Bias**

Throughout the interviews, the prevalent theme regarding searching for alternatives was through two mediums: internet and people. Smart decision makers save time for searching for alternatives by asking other people or experts who may have already walked that path and gained experience. While asking networks, colleagues or other people in the IT industry can save time, it can also introduce bias for the decision maker. Colleagues or people in the industry can have their own agenda for instance (i.e., be paid to promote certain alternative), may not have up-to-date information about the service or may have decided on an alternative based on a different set of attributes that were important for *them*.

The definition of bias according to TheFreeDictionary (2014) is a preference or an inclination, especially one that prevents neutral judgement. Other forms of bias can affect the decision making process by overconfidence bias. This is supported by Payne *et al.* (1993), one of the most well-established errors in judgement is overconfidence bias and we normally think we know more than our answers really indicate.

## **Depth of Search**

The number of alternatives is a result of the depth and scope of the search. Typically, the interviewees would search for 2-3 alternatives for lower impact services and an average of 4-6 alternatives for higher impact services such as ERP or management software. FCHB stated that even if he found the first alternative that looked perfect, he would still search for further alternatives in case he is missing some features, or that he would want to check how the first alternative competes with the industry norm. This method is different from decision-making methods (WADD, EQW and SAT) where all alternatives are discovered, their attributes investigated, rated and cut-off levels set.

## **5.4 Problems facing decision makers**

### **Accuracy**

As figure 2.1 illustrates, the accuracy of decision-making methods are relative to the amount of effort involved in decision-making process. While WADD, EQW and MCD exhibit the highest efforts and thus have higher accuracy, LEX demonstrates half accuracy as WADD with half effort of WADD. EBA has the lowest effort with quarter that of WADD and around 1/3 of the accuracy of WADD.

### **Difficulty explaining mental processes**

During the interviews, it became apparent that the interviewees had difficulty explaining their mental process. They would start explaining how they actually make decisions, then stop and go back and correct themselves. Additionally, they would give conflicting replies, which may indicate that “they have not thought about the process and are creating it in their minds correcting themselves as they go along”; or that “they overthink the problem and try to add more detail than necessary”.

## **5.5 Swedish focus**

Participants were asked about the importance of service being offered in Sweden. SSAB and NCAB replied very important and FCHB replied that location (in Sweden) somewhat mattered. Both SSAB and NCAB chose Sweden-based domain, web hosting and designer because it would be easier to get in touch and resolve issues. For SSAB it was very

important to have local access to their server that was hosted in a co-location. This was because they need physical access to the server and that it was important for the organization to have their data in Swedish borders.

For solutions such as ERP and inventory management solution, the preference of many Swedish companies is the localisation of the solution to meet Swedish business needs. At basic levels IT services' language localisation and on higher level, compliance with Swedish and tax law compliance is important to Swedish organizations.

While currently available online storage services are only available outside Sweden, NCAB and SSAB choose to back up their sensitive data on offline storage and on the dedicated server in Sweden respectively. SSAB could have implemented their SAP ERP solution as "on-demand" service which would have been easier to implement, as SAP would have taken care of the server-side maintenance and backup. However, SSAB chose to go with the "on premise" solution because the data would be kept in Sweden.

FCHB operates with one of its partners in Jönköping, Sweden and the other in Helsinki, Finland. Five out of six of FCHB's past customers are in Sweden (First Chance, 2014) and the website is entirely in Swedish language. This demonstrates that while FCHB's customer base is in Sweden and they offer their service primarily to Swedish companies, Sweden, as location does not play a significant role for the IT services FCHB requires in order to operate.

## **5.6 Decision making strategies in use**

All three companies in the research claimed they had no knowledge of academic decision-making methods or that if they had in fact used one, it would have been unintentional and without their knowledge. Both NCAB and SSAB responded that discussion is an important part of their decision-making process.

The participants were asked to describe their mental process that happens when they want to make decision over selection of an IT service. The recurring theme within this part of the interview was the fact that none of the participants could readily describe their mental process of decision-making. They started talking and then started self-correction and returning to the conversation with frequent rephrasing, "errr" and "ummm" which indicated that they are unsure of how they do it. All participants seem to prefer the cognitively easier alternative-based processing, where all attributes within an alternative are evaluated before moving onto the next alternative.

### **First Choice HB**

The participant from FCHB described two different decision making processes in two different questions.

In the first description, it was explained that branding of the company or the website is the first thing that he considers and if the aesthetics of the site is not eye-catching, he will move on to the next alternative. For FCHB that operates within web development industry, "first look" matters. The second thing that matters is "features" that he is looking for. If those features do not exist, he moves on to the next alternative.

This selective method of attribute processing is explained by Bettman *et al.* (1991) to involve elimination of attributes or alternatives based on partial processing of information without considering if additional information could possibly compensate for a poor value.

The participant also utilizes a non-compensatory processing where high rating on less important attributes cannot compensate for bad rating on most important attributes (Bettman *et al.*, 1991).

Once the participant has selected the alternative that suits his needs, he extends his search for other alternatives in order to find free alternatives to the same service.

For local IT service, FCHB's participant has a strategy of picking the first alternative that meets its criteria because searching for local IT service involves more effort and is more time consuming than sitting behind a computer searching on Google. This method is close to Satisficing (SAT) heuristic.

The second explanation that the user gives is that all attributes have weights. Features/quality has a weight of 1, support has a weight of 0.9 and price has a weight of 0.8 which the participant multiplies the score given to each alternative and adds them up. He then compares the alternatives and picks the one with the highest score. This is Weighted Additive (WADD) method. The interesting thing about this revelation was that while the participant is a University graduate, he has had no training in decision-making and asserted that he does not know any decision-making methods. In FCHB, only one person is involved in the decision-making process.

### **SEAB Synergy AB**

The participant from SSAB described his mental decision making method in two similar versions. He stated that decision-making methods varied according to different IT services. This is because more important decisions that affect the organization or for longer period require more consideration. Therefore, the participant minimizes his attention and search for decisions with lower risk or return.

The SSAB searches for 4 or 5 alternatives (for ERP), comparing them, then discussing "advantages" and "disadvantages" with the company relates to the decision making heuristic "Frequency of Good and Bad Features (FRQ)". In this heuristic, the "good" and "bad" features of the alternatives are counted and selection is based on the alternative with the highest count of "good" or lowest count of "bad" features.

The interviewee maintained that during the first (technical) phase of decision-making, he was responsible to evaluate the service technically. When he found the different alternatives, he would list and compare them on different characteristics (attributes) that the company is looking for. During the second phase (discussion), he explains why certain alternative is the best solution to his manager. Then they would both come to a mutual agreement what solution should be selected. SSAB participant displays an alternative-based processing where alternatives are evaluated on frequency of good features (Payne *et al.*, 1993). Further, in the selection of ERP solution SSAB participant seems to be using consistent processing where all information for every alternative and attribute is processed. However, in order to reduce the amount of processing and time needed, the attributes will be limited to few characteristics (price, security, compatibility and user-friendliness). In SSAB, up to five people are involved in the decision-making process after the IT manager has made preliminary processing about choices.

## North Carpet AB

The interviewee from NCAB described his decision-making method as searching Google and learning about the field of the service (general information). For inventory management solution, the participant found about the existing alternatives on offer (software, cloud-app and android app). NCAB did not require complicated software and what was important was that it would integrate with barcode readers. Therefore, the most important attributes are simplicity and barcode reader integration. After testing the alternatives, he took notes of the attributes regarding each alternative and proceeded to discuss with his colleagues. This decision-making method is attribute-based because lack of an attribute (simplicity or barcode reader integration) meant throwing away that alternative and moving to the next alternative. Further, the processing is of selective nature where partial processing of attributes (does it integrate with barcode readers/is it simple) is all that is needed to decide whether the alternative should be kept or eliminated.

The decision-making method utilized by NCAB appears to be Elimination by Aspects Heuristic (EBA). Payne *et al.* (1993) maintains that this procedure involves determining most important attribute, then cut-off value for that attribute is selected and all alternatives with values below the cut-off level for that attribute are eliminated.

The EBA method continues with the second most important attribute and so on until only one alternative is left behind. That is the chosen alternative. In NCAB, up to three people are involved in the decision-making process once the IT responsible has made preliminary assessment of the alternatives.

## 6 Conclusions

This chapter presents a summary by providing answers to the thesis' research questions.

This thesis has analysed the decision-making methods of Swedish SMEs in selection of an IT service provider. The thesis is primarily based on the theories of decision-making by authors Payne et al. (1993) and understanding the cognitive process by descriptions of March (1994). During secondary data search, different determinants of service quality were found in which table 4.2 by Yang and Fang (2004) was found to be a good list to compare the attributes of IT service with.

Three interviews were accomplished with companies in three different business sectors with sizes ranging from two persons up to 50 people. Out of the three companies, two were newly established in 2013. The size, age and business-sector of the company had direct effect on the types of decision-making and desired IT services. The larger company with more employees needed multipart ERP implementation while the smaller yet older company needed a simpler ERP implementation in the form of inventory management. The smallest company did not have the need for any enterprise solutions.

Price was the important determinant in service selection for the largest company, in part because of its young nature and in other part because the large-scale ERP implementation can be a costly affair, costing tens of thousands of Swedish kronas (SEK). Cost was also important to the small and young partnership company but not as much as the largest organization, perhaps because of the lack of need for an expensive and large-scale enterprise solution. For this company value-for-money was one of the top five most important criteria. The business sector for the First Choice HB dictated the top five most important attributes because they all relate to IT services in web development and web design.

While Google was the preferred source of information for research regarding alternatives, word of mouth and colleagues also played an important role in collecting information and asking for others' opinion.

Perhaps the most significant conclusion is that Swedish companies prefer to work with other Swedish companies, or at least other companies that are also registered in Sweden. This is partly because most Swedish companies find it simpler to work with other companies in Sweden because calculating tax deductions and expenditure is easier for them. Another reason is the fact that Swedish companies trust other Swedish companies more than other countries and information security plays a major role in their choice.

The answers to research questions are as follows:

*Q1. "Which decision making strategies have the most contribution in IT service selection by small and medium sized enterprises?"*

Through this research, I have discovered that the decision-making strategies with most contribution to Swedish SMEs are dependent on several factors such as scope of search, importance and impact of selection on the organization and the amount of attention and effort that the decision-maker wants to put for the decision making process. The participants seemed to prefer faster heuristics to more accurate methods.

The heuristics that the participants utilized to speed up their decision-making process or to maximize accuracy are as follows:

- First Chance HB: SAT (speed), WADD (accuracy)
- SEAB Synergy AB: FRQ (speed)
- North Carpet AB: EBA (speed)

*Q2. “What are the most important attributes of an “IT service provider” in its selection?”*

For this question, table 6.1 illustrates 19 attributes for IT services that are important to the Swedish SMEs in this study. The Swedish SMEs have recognized 12 attributes chosen as their top five most important attributes (with three pairs of duplicates). Table below displays the chosen important attributes according to each company.

Table 6.1 Comparison of top five IT service attributes for different companies

<b>First Chance HB</b>	<b>SEAB Synergy AB</b>	<b>North Carpet AB</b>
1. User friendly (Application / IT helpdesk) 2. Prior knowledge (about provider or program) 3. Attractive (Website) 4. Support/Customer Service 5. Value for money	1. Security/Trustworthiness 2. Price/Cost 3. Easy to use/Simplicity (Application) 4. Support/Customer Service 5. Location (in Sweden)	1. Security/Trustworthiness 2. Ease of use/Simplicity (Application) 3. Multiplatform integration 4. Location (in Sweden) 5. Quick response

## **6.1 Further Research**

Regarding IT service selection, further research in other business sectors could be done to investigate additional attributes that are important to Swedish SMEs. The findings of this thesis could be a basis for further research in other countries to evaluate whether or not IT service requirements are the same as those found for Swedish SMEs in this thesis.

For decision-making methods, further research could reveal other strategies that are utilized. Moreover, this thesis could be used as a basis for research on the decision-making strategies utilised for service selections other than IT services.

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