UNIVERSITY OF AMSTERDAM
MSc Information Science
Business Information Systems

Thesis

Non-formal factors and choice of
Information and Communication Technology
Cross-sectional study on the U theory

Eleni Thalassinou
Student No. 10407057

Supervisor
Toon Abcouwer

August 2013
Non-formal factors and choice of Information and Communication Technology: Cross-sectional study on the U theory

Eleni Thalassinou (10407057)

Thesis Master Information Science – Business Information Systems
University of Amsterdam Faculty of Science
Table of contents

Introduction .......................................................................................................................... 1

1. Background .................................................................................................................. 2

2. Research question ....................................................................................................... 8

3. Methodology ................................................................................................................ 10
   3.1. Research Strategy .................................................................................................. 10
   3.2. Sampling ................................................................................................................ 10
   3.3. Research Relationship ......................................................................................... 12
   3.4. Data collection ...................................................................................................... 12

4. Methodology Testing .................................................................................................. 14

5. Data analysis .............................................................................................................. 14
   5.1. Coding ................................................................................................................ 15

6. Results ........................................................................................................................ 16
   6.1. Code frequency analysis ...................................................................................... 16
   6.2. Code co-occurrence analysis .............................................................................. 20
   6.3. The levels of the U .............................................................................................. 22
       6.3.1. Level 1 - Downloading ............................................................................... 22
       6.3.2. Level 2 – Open mind .................................................................................. 23
       6.3.3. Level 3 – Open heart .................................................................................. 25
       6.3.4. Level 4 – Open will .................................................................................... 25
       6.3.5. The enemies ................................................................................................. 26
       6.3.6. The U and public/private sector .................................................................. 27
       6.3.7. The U and profession .................................................................................. 28

7. Discussion and Future work ......................................................................................... 29

8. Conclusions .................................................................................................................. 30

References ......................................................................................................................... 32

Appendix A ........................................................................................................................ 34
   Coding Scheme ............................................................................................................ 34
   Code Application .......................................................................................................... 38
   Code Co-occurrence ..................................................................................................... 40
   Interview guideline ...................................................................................................... 44
Appendix B ................................................................................................................................. 45
Interview 1 .................................................................................................................................. 45
Interview 2 .................................................................................................................................. 48
Interview 3 .................................................................................................................................. 54
Interview 4 .................................................................................................................................. 57
Interview 5 .................................................................................................................................. 62
Interview 6 .................................................................................................................................. 66
Interview 7 .................................................................................................................................. 70
Interview 8 .................................................................................................................................. 74
Interview 9 .................................................................................................................................. 76
Interview 10 ................................................................................................................................. 78
Introduction

The introduction of Information and Communication Technology (ICT) in modern business environments over the past decades has brought up several benefits as well as problems organizations have to deal with. Undoubtedly, technological advances have introduced a new era in the way business is run, with many parts of the process being digitized and computerized. However, technology continues to develop, together with organizational realities. The struggle to bring the two fields – business and Information Technology – together becomes ever more challenging as both evolve independently as well as in collaboration with each other.

One of the most difficult battles that Information Technology specialists have to fight is to find the tools, the opportunities, the source that will lead the organization to achieve its goals. Information technology, in this setting, can be viewed as a facilitator, as the driver of change or even an unidentified combination in between. In any case, once at least a direction has been determined, the administration of the organization is presented with the complicated procedure of deciding on specific technology, on a specific system or on specific requirements and development approach.

Decision-making, as a process the outcome of which is the selection of a course of action among the several alternative scenarios, applies in many fields as well as this specific one. As this field draws from many disciplines and usually a lot of different stakeholders are involved, coming to a final decision becomes a complicated procedure. Employees, management, chief officers, vendors, partners, investors, among other stakeholders, each one with different demands and interests make the decision even more difficult.

Complexity rises especially since decision-making processes are unlikely to stick to objective criteria, as long as people are involved in making the final choice. The aspects that affect such procedures could be formal as well as non-formal. The latter refers to factors that are rather subjective, related or affected by the personality, goals and inherent characteristics of the person or people involved. Some of these factors are acknowledged, appreciated even, while others exist in an underlying source of influence.

The non-formal part of the decision-making process presents a number of issues. On the one hand, it is difficult to define, as it mainly originates in the personality of the decision-maker. On the other hand it is even more difficult to study and analyze. For this purpose the U theory, a framework primarily aiming at better leadership practices, is used to describe and analyze practices followed by managers and consultants when dealing with procurement of Information and Communication Technology.
1. Background

Over the past decades information technology has become an integral part of all aspects and expressions of business activity. Information systems are used to facilitate, drive or determine business realities across different sectors all over the business world. The task of opting for specific ICT solutions is, however, quite challenging and has long been the topic of discussion for both academics and practitioners. There exist numerous different frameworks and theories designed to help managers in the task of deciding for the specific information systems and technology that would bring efficiency and enhanced performance, cost reduction, added value, competitive advantage and new opportunities to their organization.

Decision support frameworks related to information systems adoption have been addressed and examined plenty of times in the literature. Popular techniques are cost-benefit analysis, requirements and needs prioritization, and information economics among others. A framework to support the adoption of information technology, and specifically Enterprise Resource Planning (ERP) systems, by Small and Medium Sized Enterprises (SMEs) is described by Blackwell et al. (2006). The main steps described in this framework include identification of problems related to information systems, evaluation of the feasibility and necessity of implementation and assessment of available information systems and vendors. They also state that it is necessary to “assess the impact that integrated systems are likely to have on the company once they have been implemented”. This idea is also supported by Bradford and Roberts (2001) who argue that “senior management must identify the business benefits that will result from an integrated systems project, and then ensure that every project-related action is directed toward achieving those benefits”. (Bradford & Roberts, 2001 cited by Blackwell et al., 2006)

Similarly, Van Everdingen et al. (2000) found that for European SMEs the most important criteria for information systems selection are the quality of services offered by IT suppliers and the fit of the information system to current business procedures. Other factors considered were flexibility of the systems, cost, user friendliness and scalability. In addition, the factors considered important for software supplier selection are the functionality and quality of the product, implementation speed, possibility to interface with other systems, price, market leadership, corporate image and international orientation.

Along the same lines, Bacon (1992) examined the significance of financial, management and development criteria on technology investment decisions. The financial criteria include net present value, internal rate of return, average rate of return, and payback method. The management criteria include support of explicit and implicit business objectives, support for management decision-making, probability of achieving benefits and legal requirements. Finally the development criteria include technical requirements, familiarity with the new technology introduced and probability of project completion.
Moreover, Parker and Benson (1988) in Information Economics, describe methods through which the value of information is quantified and linked to the performance of an organization. The goal is to determine how much information technology is worth, in relation to the amount of money a company is willing to invest. They specifically “define value based on improved business performance, and cost based on total organization cost, which taken together define the true economic impact of information technology”. Managers are presented with a set of decision-making criteria, and based on the different characteristics of the possible solutions regarding value, cost and risk, can choose between and prioritize possible investments.

On the other hand, there exist supporters of the idea that these kinds of methods, when employed in the context of the ever changing and highly volatile contemporary environment, are not enough. Nowadays, organizations operate in dynamic contexts with highly interconnected global economic, social and technological networks. This setting makes them vulnerable to unexpected crises, either small or big. Reality in an organization changes continuously and the assumption that it will remain untouched after the implementation of new technology – which itself constitutes a major change – is usually proven wrong. In addition, the interconnectivity that characterizes current business networks poses an ever increasing demand to satisfy different interests, stakeholders as well as “multiple and conflicting strategic objectives” (Brigham & Introna, 2007).

To this end, there come researchers and practitioners to argue for a new way of taking hold of reality and the changes it undergoes, with a goal to manage them effectively. Otto Scharmer (2007) elaborately describes a process through which change can be handled at an individual, organizational and global level, by shifting the center of attention from the past towards the future. He supports the idea that the process of responding to challenges and crises is not adequate if only based on past experiences:

Companies are struggling to succeed in an unprecedentedly turbulent, complex and rapidly changing global context.
Their executives realize that simply reflecting on what has happened in the past will not be adequate to help them figure out what to do next. (Scharmer, 2007, p. 51)

The same notion is put forward by Adam Kahane in Solving Tough Problems (2004), who suggests that:
A problem that is generatively complex [a problem whose future is unfamiliar and unpredictable] cannot be solved with a prepackaged solution from the past. A solution has to be worked out as the situation unfolds, through a creative, emergent, generative process. (p. 101)

Accordingly, the “revolt” and “remember” forces in an organizational context, as described in the adaptive cycle of resilience (Abcouwer & Parson, 2011), fight in
seek of a balance, as relying only on the past results in rigidity. This balance is achieved as “pride of the existing” and “curiosity for the new”. With the help of curiosity and pride, organizational settings can go through the crisis and new combinations phase, back to business as usual.

The assumption that is made at this point, but is solidly supported by numerous stories both in the academic and business world, is that information technology when introduced in organizational settings constitutes itself a big change. Information technology can be introduced to support new or old processes. Existing systems may need to be replaced by new or similar existing ones. In such cases a number of things undergo or need to undergo change: communication patterns and processes, skills, regulation, basic functions from operational to administrative level, infrastructure. Simultaneously, the particular setting of every organization, which is created by the people, the location and the culture, makes the adoption of new information technology a unique problem that has to be handled differently in every situation.

In order to escape from the past and deal with unprecedented problems, to which the answer is unknown, Scharmer introduces the U process, which consists of seven steps – downloading, seeing, sensing, presencing, crystallizing, prototyping and performing. The ultimate goal of this process is to identify the highest future potential and realize it. In the process of these seven steps, through which managers can deal with complex problems from a different perspective, by “trusting their senses, observations and perception”, Scharmer describes a number of different factors that reside in managers’ and leaders’ personality and that can help them in order to “do rather that think”: intuition, insight, inner knowledge, creativity, spirituality, freedom, wonder, emotional perception, imagination among others. (Scharmer, 2007)

Such issues have been the matter of inquiry for many researchers who looked into their effect on decision-making processes and leadership practices. Phipps (2012) studied spirituality, which is a concept closely connected to religious beliefs, and its effects on management, leadership and strategic decision-making. Fritzschke and Oz (2007) and Hemingway et al. (2004) examine the influence of personal values on decision-making within organizations. Emotional intelligence skills have also been studied as factors that might influence decision-making processes (Hess & Bacigalupo, 2011).

Many have also focused on the role of intuition in decision-making (Dane & Pratt, 2007; Hensman & Sadler-Smith, 2011; Lange & Houran, 2010; Lankton & Luft, 2008). Lange and Houran (2010) studied intuition and found that “experiences of intuitions in the workplace correlated with intuitive decision-making styles”. They define intuition, based on previous researchers, as an “experience-based phenomenon, where experience oriented tacit knowledge is accumulated” and then used when similar situations arise, or as a psychophysiological ability which is based on sensory and affective elements. Intuition, as a process that results in rather immediate answers and does not involve conscious thinking, would presumably fit better in more routine decision-making procedures. However, researchers found it to be important in
unexpected situations where no previous experience exists. In addition, Dane and Pratt (2007) argue that intuition is a “potential means of helping managers make both fast and accurate decisions in organizations”.

Some theories also try to achieve a balance between traditional quantitative approaches, such as cost-benefit analysis, and intuitive decision-making. Options analysis “captures and formalizes the managers’ intuition and thus it creates a disciplined decision-making process” according to Taudes et al. (2000). Intuitive judgment is possible to “approximate real options-based valuations” of IT investments (Lankton & Luft, 2008).

Evidently, many researchers have acknowledged the importance of non-formal parameters in decision-making process and leadership practices. It is important to clarify here which factors fall under this category. Taking into consideration the very meaning of the word, a formal approach for decision-making has a clear form or structure, is meticulous, methodical and in accord with accepted conventions and regulations. Thus, non-formal are the approaches that stray away from traditional quantitative, mathematical and deterministic models. Taking into account this definition, the U Theory belongs to the latter category and is chosen to support this research because it provides a complete and detailed framework, which incorporates a number of non-formal factors into one process. It presents us with a “holistic perspective that also includes the more subtle mental and intentional spiritual sources of social reality creation” (Scharmer, 2007, p. 14). It takes into consideration the personality and inherent characteristics of people involved and the impact these have on the environment.

The U process describes a journey from reacting based on past experience and habits (downloading), noticing disconfirming data and seeing “with fresh eyes” (seeing), opening up emotional perception and “wondering what the reality looks like”, to connecting to the highest future possibility (presencing). The remaining steps describe the process of bringing the inner emerging knowledge to practice, by defining vision and intention (crystallizing), practicing the new by linking head, heart and hand (prototyping) and finally embodying the new reality (performing). In this process, individuals and teams have to let go of their voice of judgment, cynicism and fear in order to experience the open mind, open heart and finally, open will.

Alike principles and practices are also described by Kahane (2004) for solving problems especially within the dynamic of teams. He suggests that in order for new realities to emerge, first people need to talk and communicate their thoughts honestly. And second, they need to listen openly and reflectively, allowing others’ point of view to be heard and to be taken into consideration. Ultimately, through this process the team is able to cooperate and operate as a whole, to give rise to new possibilities and finally to create new realities.

These ideas describe new kinds of decision-making processes, which focus on the source of the decision, rather than the process itself or its outcome. Drawing from Scharmer’s (2007) reasoning: “What if the quality of the visible social worlds is a function of this invisible field that resides in our blind spot of perception?” (p. 54), we
could argue that the quality of the decisions, in our case related to information technology adoption, is a function of managers’ personality, perception of reality, values, inner knowledge and point of view.

Brian Arthur, as quoted by Kahane (2004) argues:

> For the decisions in life, you need to reach a deeper region of consciousness. Making decisions becomes not so much about deciding as about letting an inner wisdom emerge. (p.108)

Also, Eleanor Rosch, as quoted by Scharmer (2008) says:

> Action resulting from that type of awareness [the type that relates to the open heart and open will], is claimed to be spontaneous, rather than the result of decision making; it is compassionate, since it is based on wholes larger than the self; and it can be shockingly effective. (p. 57)

Moving towards acting from the open will, one must go through different stages, ever one level deeper into consciousness and perception of reality. In every level, there are different enemies that hinder the progression to the next one. The voices of judgment, cynicism and fear impede the “descending” from downloading to seeing, from seeing to sensing and from sensing to presencing. Accordingly, they pose obstacles in the process of bringing the inner knowledge into reality: from presencing to crystallizing, from crystallizing to prototyping and from prototyping to performing.

The field of the U curve can be broken down into four levels. The first level is dominated by attention to the past, by “habitual patterns” and repetition of past behavior, which is called “downloading”. People who operate on this level are prone to relying on past experience when dealing with changes that come along, an act that is called reacting. At this stage, change is perceived as difficult and complicated and the “source of attention” originates from the center of the organization. This means that a narrower view of the problem is utilized, without

![Figure 1: The U journey](image-url)
seeing further in time or space and thus having difficulty understanding the possible consequences of current actions. A more comprehensive perception of reality is hindered by the “four barriers” or “learning disabilities”: not recognizing what you see, not saying what you think, not doing what you say and not seeing what you do.

The second level entails the shift from downloading to seeing. Here the attention originates not from the center, but from the periphery of the system. This means that the leader is able to see a broader view of the world the organization is part of, to break the barrier and look “over the fence” that separates the organization from its external environment. Change is confronted here by “redesigning” functions and processes, altering the way actions are performed, focusing on the “how”. Key principles in this level include clarification of the question and intent towards which the change aims, better understanding of the context in which the system operates, development of curiosity and wonder and finally, suspension of judgment. Judgment is the enemy encountered at this stage and needs to be overcome in order to open the mind and move further into the U. Dialogue is also very important at this level, as “seeing together” with others, sharing experiences and opinions sharpens the perception of reality.

At the third level of the U consciousness moves from seeing to sensing. Leaders here begin to experience themselves as part of the system, part of the problem and therefore, the solution. They use their emotional perception and imagination to understand the underlying reasons that lead to reality as it is – they focus of the “why”. Change is confronted with “reframing”, changing the course of thought and rationale behind a certain action or situation. Change happens on a deeper level as it moves from the surface of the way things are done to the reason why they are done in a certain way and what is the purpose they serve. The enemy encountered here is cynicism, which manifests as disbelief, doubt and skepticism towards others and their opinions as well as our own. By opening the heart a more holistic view of reality can be achieved and utilized in the last step of the curve.

The fourth and last level of the U involves operating in connection to the “highest future possibility”, which Scharmer (2007) calls presencing. At this level important notions are wisdom, awareness, inner and primary knowledge, living at the present moment and connecting to the true self. This is a state at which the person, the team, the organization is void of past experiences and burdens, and focuses on the source of reality and the true self of the parts that constitute the system. The enemy at this level is fear. The leader at this level has to be daring, ready to face the fear and witness the “essential self”. The enemy here can present itself as fear of speaking up, fear of being rejected, fear of loss, fear of pain. However, it is important that leaders take this leap of faith in order to lead towards the future.

Ultimately, by using the factors that play a role in each step of the theory U down to the “present moment”, enemies as well as motivating factors, we could identify in which level managers operate. We could find out how far they proceed into the U and how they perceive the results of their actions in this level. Also, how much are managers willing to let go of their judgment, skepticism, mistrust and fear of their
intuition and inner knowledge. Do they just react to unplanned events, based on their past experiences, or do they move further to redesigning and reframing processes, through changing the sequence of actions or the underlying way of thinking? Do they, individually or as a team, reach to they point where they are able to experience the “present moment” as it actually is, to perceive reality from a rather holistic way and thus make decisions based on the “emerging future”?

2. Research question

The main question that arises from the context, described in the previous section, is related to the factors that affect managers when opting for new ICT solutions. In specific, the question is whether non-formal aspects can be incorporated into decision-making processes related to IT, and whether these factors are considered important. The non-formal aspects here are defined as described by Scharmer (2007) and the U theory. The focus is on notions such as intuition, creativity, spirituality, emotional perception, imagination, and the effect they have on managers and their decision-making processes.

The literature suggests that indeed managers are more often than not affected by factors other than those that are usually considered as formal. Based on previous research we can hypothesize that managers do not exclusively follow the formal approaches when opting for ICT solutions and are prone to also including more intuitive ways in their decision-making processes. Therefore, as managers nowadays act in very volatile environments, urged to make fast, yet efficient decisions, we can assume that the formal approach, which entails careful planning, project management and investment prioritization, is not always employed to its fullest, leaving room for considering other non-formal factors as important as well.

The meaning of importance, however, introduces a difficulty, as it may be different for each organization and manager. Organizational characteristics, such as culture, size, business objective and situational issues or problems may give a different meaning to importance. Thus the notion of importance has to be considered in a more broad contextual way, including the reasoning behind characterizing a factor as important. This possibly suggests the existence of influential relationships among the factors themselves. For example, the size of a company may be viewed as a factor that would affect the decisions of managers as it could translate to differences in availability of financial and human resources, in the presence of which, the manager may focus more on different factors.

However, identification of those relations or possible causal explanations, which would be very difficult to define in any case, is out of scope of this research. The focus of this project, as already mentioned, is to find out whether non-formal factors affect the decision-making processes when choosing for information systems. In addition, the qualitative analysis of the data gathered as well as the body of data itself would be inefficient to determine such relationships between the whole set of factors.
A larger sample and maybe a quantitative approach would be needed in order to use the appropriate statistical tests for such a purpose.

The research question commences from wondering about the factors that managers take into consideration when opting for new information systems. Specifically, whether those factors include non-formal aspects and whether they are considered important. Also, about differences that may exist between various settings, for example public and private sector or throughout the levels of an organization. Therefore, after forming the hypothesis that managers do use methods other than purely formal decision-making processes, the research question is formed as follows:

What is the effect of non-formal aspects, as described by Theory U, on decision-making processes regarding information technology adoption?

The question is formed in a rather “realist” way (Maxwell, 1996), but focuses on understanding how managers’ decisions regarding information systems are influenced by different factors, how managers perceive and interpret those factors and how meaning and significance is attributed within different organizational settings. The questions could be characterized as process and interpretive questions, according to Maxwell’s categorization, as they focus on the meaning of specific concepts as well as “actors’ thoughts, feelings and intentions” (Maxwell, 1996).

Breaking down the research question, we define “effect” as the possibility of managers being influenced by non-formal factors in their decision-making processes. The non-formal aspects that are described in U theory will be depicted for this research on the levels that are formed by the steps of the U process, the enemies that have to be faced in each of them and the forces that motivate moving from one level to the next one.

The ICT solution that managers will in the end choose for may be either purchased from the market, built by the organization itself, or outsourced to a third party. The situations in which organizations decide to develop a solution or outsource the development are included in the scope of the research, excluding though the part of requirements specification, as these are issues tackled by requirements engineering projects. In both cases the same factors would play a role in coming to a final decision, whether this is choosing a system that already exists in the market or deciding that a custom-made solution would best fit the needs of the organization. Ultimately, the project focuses on the process that begins with identifying the need or possibility of incorporating new technology in the IT portfolio of an organization until the final choice between the various alternatives.

The goals that the research question serves is to understand whether managers act guided by formal processes in such situations or incorporate, even without noticing, other factors innate to their personality. Ultimately, whether choosing for information systems is aided by formal decision-making or managers follow their instincts. The final goal is to understand if factors as the ones described by U theory “pay off” – or are perceived as such – when considered important. In addition, differences in what managers consider important could help identify differences in the role IT plays, in
relation to organizational characteristics, such as size or organizational level adopting the new technology.

3. Methodology

3.1. Research Strategy

The research strategy for this research follows the qualitative paradigm. Decision-making procedures have been studied using a variety of different research designs and methods. Within the information systems field of study, which is rather interdisciplinary and draws from many different subjects, both quantitative and qualitative strategies have been employed. For the specific question at hand a qualitative approach is appropriate as the focus is on how managers come to a decision about Information and Communication Technology. The matter of inquiry is the process managers go through as well as their intention as the starting point of this process.

The most important features that describe qualitative research, as noted by Bryman and Bell (2011, p. 386), relate to this research as well. First, “the stress is on the understanding of the social world through an examination of the interpretation of that world by its participants” and second “the social properties are outcomes of the interactions between individuals, rather than phenomena ‘out there’ and separate from those involved in its construction”.

The third one of the features that Bryman and Bell (2011) list for qualitative research is an “inductive view of the relationship between theory and research, whereby the former is generated out the latter”. Qualitative research is usually viewed as following the interpretive paradigm, where the theoretical framework is developed after the interpretation of the data. However, it is used in the process of testing theories as well, where the conceptual and theoretical framework is formed prior to data collection and analysis. The latter case is used for this research, as an existing theory of decision-making processes will be tested in an information technology related setting.

Concluding, the research questions proposed above would best be answered using a qualitative approach, within a cross-sectional study, following the positivist paradigm. The main focus is to understand the importance that managers ascribe to the set of factors derived from the literature and to capture the level of consciousness as well as the perception of reality this level leads to.

3.2. Sampling

The informants for this research are managers and consultants that are involved in decision-making procedures for information technology in organizations. A probability sample would be very hard to achieve, as it would require random selection from enterprises in which such managers exist. This would render the project infeasible,
given the available resources and time restrictions. A purposive sampling strategy was chosen as it best fits the situation.

The methods of the proposed research include the realization of two rounds of interviews. The first round was realized in order to test the set of questions for the interviews and to build a basis concerning the effect of non-formal factors when choosing for information systems. The data set that produced the final results includes both rounds. For both sets of interviews a purposive sampling strategy was used. For the first phase of data collection, two interviews were realized with professionals in the field of Information Technology. The first two interviews proved that, as information technology is a matter with very distinct value and meaning for every organization, both IT managers and IT consultants should be included in the sample for the research. Managers on the one hand are the actual decision makers, the ones that have the final responsibility. On the other hand, IT consultants have experience in different kinds of organizational settings and may be able to provide more objective information on how managers make decisions about IT as external observers of the process.

Overall, during the data collection phase, ten interviews were realized. The informants were chosen because they are experienced professionals in the field of Information Technology, in the Netherlands, both in the private and public sector. The data collection phase was complete with these interviews, as the last ones did not introduce any new concepts to the coding scheme and the same patterns repeated. The descriptors of all the informants are as follows:

<table>
<thead>
<tr>
<th>ID</th>
<th>Profession</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Consultant</td>
<td>Private</td>
</tr>
<tr>
<td>2</td>
<td>Manager</td>
<td>Public</td>
</tr>
<tr>
<td>3</td>
<td>Manager</td>
<td>Public</td>
</tr>
<tr>
<td>4</td>
<td>Manager</td>
<td>Private</td>
</tr>
<tr>
<td>5</td>
<td>Interim manager</td>
<td>Private</td>
</tr>
<tr>
<td>6</td>
<td>Consultant</td>
<td>Public</td>
</tr>
<tr>
<td>7</td>
<td>Interim manager</td>
<td>Public</td>
</tr>
<tr>
<td>8</td>
<td>Consultant</td>
<td>Private</td>
</tr>
<tr>
<td>9</td>
<td>Manager</td>
<td>Public</td>
</tr>
<tr>
<td>10</td>
<td>Consultant</td>
<td>Private</td>
</tr>
</tbody>
</table>

Table 1: Informants and descriptors

The sample consists of consultants, managers and interim managers in the field of Information Technology. Some of the informants have interchanged between the three professions in the past but their most recent position has been chosen as descriptor for the research, as it was the most prominent in their answers. The diversity in terms of profession within the sample adds to the reliability of the data gathered. This way, the problem of choosing for new information technology is viewed from different angles – the perspective of a consultant who works with multiple, different organizations, a manager who works for one organization and knows the processes
from within, and an interim manager, who is usually dedicated to one project. Using these different perspectives, not only the factors identified in the literature are tested in different settings, but a number of other factors emerge as well.

In addition, the representation of both the public and private sector in the sample gives a broader view of the issue. Governmental organizations comprise an important part of the country’s workforce and managerial resource. It also gives the opportunity to identify differences between the two sectors regarding the way they operate in IT related issues.

These two descriptors – profession and sector – will be used as possible sources of differentiation in the effect of non-formal aspects. Regarding other descriptors, the two genders are not equally represented, with only two of the informants being women. This makes it difficult to find differences between the female and male perspective on the matter. The rest of the demographic characteristics of the informants, such as age or nationality, do not present significant differentiation, leaving these two – profession and sector – to be used in the analysis of the data.

3.3. Research Relationship

During the interviews in order to be able to collect data that is as reliable as possible, a specific relationship has to be established with the informants. The interviewer should treat interviewees as an impartial observer, as it is easier for the informants to talk to someone out of the context, who has no direct relationship to the organization or its environment. These guidelines were followed during the interviews in order to establish the necessary rapport and invoke reliable information. Also, anonymity of the interviewees or other actors in their environment will be preserved. This reassurance helped create a basis of trust between the two parts. Additionally, the interviews were conducted at the convenience of the informants, in terms of time and place, in order to establish a good basis for the interview. Finally, in order to ensure the sincerity of the informants, it was made clear that a level of sensitivity and discretion will be preserved, especially regarding confidential information about business goals and strategies.

3.4. Data collection

The method that was considered the most appropriate for data collection was semi-structured interviews. Other qualitative methods for data collection, such as observation would not be of use for this specific subject as the focus is on managers’ perspectives, course of thought, and past decisions. On the one hand, with the semi-structured interviews, a specific, pre-determined set of issues was covered, including the factors identified in the literature. The informants were also able to argue for their answers and explain their rationale and express their own ideas and interpretations on the matters. On the other hand, interviewer and interviewee were given the freedom to touch upon different issues that arose while conducting the interview, thus enriching
the content of the project. Bryman and Bell's (2011) characteristics of qualitative interviews are in accordance with the goals of this research, which call for “the interviewee’s own perspectives, point of view, insight into what the interviewee sees as relevant and important, rich and detailed answers, flexibility in the order and wording of questions”.

However, the freedom that is given to interviewer and informant through semi-structured interviews poses an issue in general and especially at the beginning of the data collection stage, which is related to the interpretation of the questions by the informants. In order to tackle this issue and since the answers are not predetermined, the questions underwent a testing phase, with two interviews. This helped understand how the questions are interpreted and what kind of answers they invoke. It also helped to map the processes through which managers come to a decision about adopting a new system, and to determine whether the interview questions were appropriate in order to answer the research questions.

The interview questions were not predetermined, but were altered in the process, depending on the interviewee and the specific organization. Please refer to Appendix A for a sample questionnaire that was also used as a guide for the interviews. The questions in every interview covered the following subjects:

- **Process followed**: the process that the interviewees follow, or the process that they think is being followed by others when making decisions regarding procurement of Information and Communication Technology.
- **Important information**: the information that the interviewees consider important in this process as well as the availability of the information that is necessary to come to a decision.
- **Experience**: thoughts on how important experience is in this setting and why. Interviewees were asked to reflect on how much they rely on past decisions, success stories or failures when in sight of a new project.
- **Teams**: the role of teamwork in this kind of decisions, the importance of discussion with colleagues or other associated parties.
- **Perception of reality**: what methods managers employ in order to better understand the reality in the organization. The ultimate goal of this subject was to understand what they consider crucial in assessing the current state, the future expectations and the effect of new technology in the organization.
- **Non-formality**: interviewees were asked to share their thoughts on decision-making processes that do not follow the formal path of procurement strategies, such as IT economics or portfolio management strategies.
- **Obstacles**: what obstacles do decisions regarding Information and Communication Technology encounter in an organizational setting. This subject helped understand how managers experience the role of ICT in an organization and the associated challenges.
• **Enemies**: the goal of these questions were to capture issues related to the three enemies in the U curve – voice of judgment, voice of cynicism and voice of fear – and whether they are identified or even fought by the interviewees.

• **Advice**: the interviewees were asked for their advice towards managers in the position of making IT procurement related decisions. Their advice shows what they think works, is more successful or influential, what has affected their decision and proven right in the past.

4. **Methodology Testing**

In order to test the method that was selected to collect the data – semi-structured interview – as well as the specific set of questions that was initially created two test interviews were conducted. These first interviews were primarily aimed at evaluating the validity and appropriateness of the method and the questionnaire. The goal was to understand whether the questions would be comprehensible for the informants and would stimulate answers that could be mapped and related to the underlying theory. Another goal was to understand if they could provide enough information for the analysis phase.

The test interviews brought to light an issue considering the research design and methodology. It is related to the actual role that informants have in decision-making processes. One of the informants was a consultant in the field of IT and organizational change. That is, an observer and facilitator rather than the actual decision-maker. Consultants provide an external and more objective perspective of the way that managers make decisions. In that sense, and in order to increase the credibility and reliability of the results, both managers and consultants were included in the sample. Managers, as the actual decision-makers provided their perspective from inside the system, while consultants gave an impartial view of the respective process.

5. **Data analysis**

The interviews were recorded and transcribed before the analysis of the data, thus ensuring that no misinterpretations occur on behalf of the interviewer. For the transcription, a denaturalized method was used, as the focus is on the “substance of the interview, that is, the meanings and perceptions created and shared during the conversation” (Oliver et al., 2005). This means that little or no attention was paid to talking patterns, overlapping talk, pauses, emphases and other non-verbal tokens and activity. Instead, the transcripts focused mainly on accurately depicting the concepts communicated by the interviewees. Please refer to Appendix B for the transcribed data set. The tool that was used for the coding and analysis of the data is Dedoose v4.5.95 (http://www.dedoose.com).
5.1. Coding

The techniques that were used to form the coding scheme were Descriptive, and Provisional Coding (Saldana, 2009). A set of codes emerged straight from the literature to create the initial provisional list. This set includes the majority of the non-formal codes. The rest of the codes were identified using a descriptive coding technique. Factors identified in the data set were added to the codes, which were merged, divided or categorized in the process, to form the final scheme.

The set of codes is divided into two large categories: the formal and non-formal aspects. The non-formal aspects include the four levels of the U theory, as well as some factors that emerged from the interviews. The formal aspects are not covered in the literature review, but were identified in the data set as an important part of the decision-making process.

The first level of the U theory includes codes describing behavior that manifests when managers are primarily attached to past experiences, decisions and their outcomes. The second level portrays managers that are trying to take hold of the problem and understand it from a broader perspective. They look for new solutions, make plans, and wonder about different approaches to solve the problem. The third level is about letting go of skepticism and doubt. At this level, managers should be able to incorporate other factors to their decision-making process, such as emotions and imagination. The fourth and final level represents the state where managers take hold of reality without relying on the past, overcome their fears and let their inner knowledge emerge. Please refer to Appendix A for a more detailed description of the whole coding scheme.

- **Non-formal**
  - **Level 1 / Downloading**
    - Architecture
    - Comfort
    - Consequence ignorance
    - Experience
    - Learning disabilities
    - Proven concepts
    - Reacting
    - The atom is the center
  - **Level 2 / Open mind**
    - Curiosity / Wonder
    - Holistic view
    - Judgment
    - Redesigning
    - Share understanding
    - Team effort
    - Understanding reality
  - **Level 3 / Open heart**
    - Cynicism
    - Emotional perception
    - Imagination
    - Listen / Reflect
    - Reframing
    - Vision
  - **Level 4 / Open will**
    - Dare
    - Fear
    - Inner knowledge
    - Living in the present
    - Think of the future
    - Wisdom / Awareness
  - Culture
  - Personal
6. Results

6.1. Code frequency analysis

In the table below we can see the occurrence of the codes throughout the data set. The codes are divided in two categories, as mentioned above, the formal and non-formal. The first column corresponds to the total number of applications of the respective code. The second column displays the percentage of each code out of the total amount of code occurrences. The third column represents the percentage of each formal and non-formal aspect of the total amount of occurrences of formal and non-formal codes respectively. In the last column the percentages of the non-formal aspects are computed based on the amount of code applications corresponding to the four Levels of the U, and the ones corresponding to other non-formal factors.

<table>
<thead>
<tr>
<th>Code Category</th>
<th>Totals</th>
<th>% of total</th>
<th>% of sub 1</th>
<th>% of sub 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 / Downloading</td>
<td>43</td>
<td>18.14%</td>
<td>30.29%</td>
<td>39.44%</td>
</tr>
<tr>
<td>Level 2 / Open mind</td>
<td>41</td>
<td>17.30%</td>
<td>28.87%</td>
<td>37.62%</td>
</tr>
<tr>
<td>Level 3 / Open heart</td>
<td>17</td>
<td>7.17%</td>
<td>11.97%</td>
<td>15.60%</td>
</tr>
<tr>
<td>Level 4 / Open will</td>
<td>8</td>
<td>3.38%</td>
<td>5.63%</td>
<td>7.34%</td>
</tr>
<tr>
<td><strong>Sum Levels</strong></td>
<td>109</td>
<td>45.99%</td>
<td>76.76%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Culture</td>
<td>2</td>
<td>0.84%</td>
<td>1.41%</td>
<td>6.07%</td>
</tr>
<tr>
<td>Personal</td>
<td>12</td>
<td>5.06%</td>
<td>8.45%</td>
<td>36.36%</td>
</tr>
<tr>
<td>What others do</td>
<td>6</td>
<td>2.53%</td>
<td>4.23%</td>
<td>18.18%</td>
</tr>
<tr>
<td>Politics / Power</td>
<td>13</td>
<td>5.49%</td>
<td>9.15%</td>
<td>39.39%</td>
</tr>
<tr>
<td><strong>Sum others</strong></td>
<td>33</td>
<td>13.92%</td>
<td>23.24%</td>
<td>100.00%</td>
</tr>
<tr>
<td><strong>Sum non-formal</strong></td>
<td>142</td>
<td>59.91%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Budget / Cost</td>
<td>19</td>
<td>8.02%</td>
<td>20.00%</td>
<td></td>
</tr>
<tr>
<td>Choices available</td>
<td>6</td>
<td>2.53%</td>
<td>6.31%</td>
<td></td>
</tr>
<tr>
<td>Financial assessment</td>
<td>5</td>
<td>2.11%</td>
<td>5.26%</td>
<td></td>
</tr>
<tr>
<td>IT as an instrument</td>
<td>7</td>
<td>2.95%</td>
<td>7.37%</td>
<td></td>
</tr>
<tr>
<td>IT as drive of change</td>
<td>1</td>
<td>0.42%</td>
<td>1.04%</td>
<td></td>
</tr>
</tbody>
</table>
As we can see, approximately 60% of the total code occurrences refer to non-formal factors, while 40% to formal. These percentages could lead us to believe that managers are in deed affected by non-formal factors regarding decision-making process for IT. Regarding the theory that was chosen to support this research, of the total amount of occurrences that correspond to non-formal factors, the U Theory covers about 77% of them. It is important to note here, that the questions were designed to invoke information that would help map the actions and thought process of IT managers on the U theory. However, the specific aspects and terminology of the theory were not used during the interviews. This means that the informants had the freedom to talk about the factors that they consider important at any time during the interview. This effectively means that factors that appear more times in the data set are considered more important because they appear more in the thought process of the informants. Their significance is dominant enough to reoccur in the answers of the interviewees.

Based on Figure 2 the hypothesis that non-formal aspects influence IT managers is confirmed. Of course it is expected that managers bring their own personality in the decision-making processes and are not restricted by what is considered formal. It is after all common sense that if decisions were to be strictly formally oriented, everybody would be able to make good and ultimately successful decisions.

![Figure 2: Frequency of formal and non-formal aspects](image)

According to Figure 3, of the total amount of occurrences that correspond to the U Theory levels, approximately 39% refer to the first level, 38% to the second, 16% to the third and 8% to the third.
fourth. Here an assumption is made that the factors managers talk about more, influence more their perspective on the matter. It seems that managers talk more about factors that belong to Levels 1 and 2 of the U Theory. This could mean that they tend to deal with ICT related issues rather passively, reacting to the problems that come along, relying a lot on past experiences and decisions. They also seem willing to suspend their judgment, connect with their colleagues, wonder about reality and try to understand it better. However, a small percentage of the codes occurrence was mapped on the third level of the U, which means that little do they realize the importance of the respective factors. It also means that it is difficult for people involved in this kind of decision to overcome their cynicism towards others as well as themselves and their own thoughts. The last level is represented with a small percentage. Accordingly, this means that that the factors in this level are not recognized as important of influential in the process deciding about IT.

![Figure 3: Frequency of U Levels](image)

![Figure 4: Frequency of aspects covered in the conceptual framework](image)

Finally, in Figure 4 we can see that of the total amount of code occurrences, 46% is covered by the literature review, while 54% is not. The interviewees were asked to answer questions about the processes that are being followed in order to choose for information technology, the special characteristics of these processes against others, similar in an organization and the obstacles that are
encountered. Almost half of this behavior can be interpreted by the theory described by Scharmer (2007) in the U curve. The rest includes formal processes as well as non-formal aspects that also influence decisions about IT.

Regarding the formal aspects that were also identified in the data set, as is shown in the Figure 5, the most dominant are Budget and Cost, Needs and Necessity, and Time. Budget and Cost are related to the budget that is available in the organization for the respective IT project as well as the cost of the available choices. Needs and Necessity refer to the needs of the organization that the information technology should fulfill. The needs are described in terms of functional and non-functional requirements and the goals the organization is trying to accomplish, while necessity reflects whether the information technology to be chosen for is absolutely necessary. Finally, the third one refers to the time that is available in order to come to a final decision. Usually, it refers to the time within which a program or project has to be completed. It is often associated by informants with negative connotations, such as the lack of time and the pressure it creates.

Figure 5: Percentage of total code occurrences

Until now, the analysis was based on the total amount of occurrences of the codes in the data set. However, the absolute number of occurrences of the codes may not be sufficient to fully understand the problem at hand. The amount of data gathered by each of the informants is not the same. The amount of information that each interviewee shared and the differentiation between them could be due to a number of factors, such as different state of mind, perspective of the problem, familiarity with decision-making processes, conscious understanding of processes that are being followed, scientific background, recent experiences etc. So, in order to get a clearer picture of the importance and influential power ascribed to the factors, we can look at the percentage of the sample that made at least one reference to each of them.
According to the Figure 6, the vast majority of the informants mention the factors corresponding to Level 1 and Level 2 of the U curve. Levels’ 3 and 4 percentages are reversed, with more people talking about Level 4 than Level 3. From the rest of the factors Budget/Cost, Needs/Necessity, Personal parameters and Politics/Power are the most important. Budget/Cost and Needs/Necessity seem to be more influential than Levels 3 and 4 of the U theory. In Figure 6 we can see that the same number of informants mentioned factors that belong to Levels 1 and 2 and factors relevant to the budget and the specific needs of the organization.

Figure 6: Percentage of informants mentioning each aspect

6.2. Code co-occurrence analysis

An interesting aspect to look into is the number of co-occurrences of codes in the same excerpts. Many times, more than one codes are applied to a data segment – usually a sentence – meaning that the informant relates the notions represented by the codes. The whole table of co-occurrences is quite large
and sparse, with most co-occurrences amounting to 1. Please refer to Appendix A for the whole table of co-occurrences. In Table 3 we can see the most important pairs of codes, who appear together more than two times in the data set. The information is visualized in a bubble chart shown in Figure 7.

<table>
<thead>
<tr>
<th></th>
<th>Level 1</th>
<th>Comfort</th>
<th>Level 2</th>
<th>Team effort</th>
<th>Budget / Cost</th>
<th>Org. level</th>
<th>Needs Necessity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Team effort</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Listen/Reflect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Budget/Cost</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Code co-occurrence

As we can see factors relevant to Level 1 and Level 2 of the U appear together in 5 excerpts. So do factors relevant to Levels 2 and 3. This means that informants who talk about Level 1 may also talk about Level 2 and accordingly, informants who talk about Level 2 may also talk about Level 3 of the U. The organizational level at which the decision takes place is also associated with the importance of team effort in the process. This means that in some levels of the organization, working and deciding in teams may be more effective or useful than in other levels. The factors of Level 2 and Needs also co-occur many times, which leads us to believe that practices like wondering about the environment, being curious, trying to understand reality and incorporating different perspectives in the process, are important in determining the needs of an organization. Budget and Cost co-occur many times with
factors relevant to Levels 1 and 2, which means that financial aspects dictate certain behavior regarding response to change and working in teams. Finally, Budget and Cost are associated with Time, as many times the availability of time affects decisions regarding budget and investments.

In Table 4 we can see the aspects that have the most co-occurrences with other factors in the coding scheme. It seems that these are the aspects that managers associate to a greater extent with their decision-making processes and maybe the aspects that influence or are influenced the most by other parameters. The same factors are the most dominant here as in previous charts.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Co-occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2 / Open mind</td>
<td>35</td>
</tr>
<tr>
<td>Budget / Cost</td>
<td>31</td>
</tr>
<tr>
<td>Level 1 / Downloading</td>
<td>27</td>
</tr>
<tr>
<td>Needs / Necessity</td>
<td>22</td>
</tr>
<tr>
<td>Level 3 / Open heart</td>
<td>20</td>
</tr>
<tr>
<td>Team effort</td>
<td>17</td>
</tr>
<tr>
<td>Time</td>
<td>16</td>
</tr>
<tr>
<td>Listen / Reflect</td>
<td>11</td>
</tr>
<tr>
<td>Comfort</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 4: Most co-occurrences

6.3. The levels of the U

6.3.1. Level 1 - Downloading

![Figure 8: U curve - Level 1](image_url)
Until now we have seen that the factors described in the U theory do play a significant role in decision-making processes according to IT managers and consultants. But in order to understand these aspects better we can take a closer look inside each of the Levels.

For the first Level of the U, the most important factor is experience, which is associated with knowledge and skill about a certain situation gained through involvement in this situation. Informants consider experience as an effective aspect in decision-making processes about IT. Most of them believe that managers who have made such decisions in the past are likely to be affected by them or even to make the right decision in the future. Informants specifically state: “I think experience is really important. When the world is unsure, managers having the feeling they can do it, helps” and “You need people that have a lot of years of experience in the organization to rely on” An IT consultant says about their clients “If managers ask me about the options I advise against, I say that I’ve seen it before and it does not work. They usually trust me” Only two of the informants view experience as a possible threat. These interviewees believe that experience may also be an obstacle, as information technology is a highly volatile and fast changing field, and past experiences might not be appropriate any more. They specifically say: “An IT managers needn’t necessarily have a lot of experience. Experience can sometimes make you less curious” and “Experience might help, but it might also be in the way, because IT is changing so much that a successful decision 10 years ago might be totally irrelevant now. You have to keep up with developments”.

Comfort is also a prominent notion in what IT professionals see as influential in decision-making processes. Comfort includes the idea that change is complicated, difficult and dangerous, and people are more willing to stay in their comfort zone than engage in changing process. As a result, adoption of new information technology in an organization is often viewed with resentment and unwillingness to co-operate. One of the informants says: “It takes a lot of effort to change the way of thinking. For people who have been working for 20 or 30 years in the same way, it is nearly impossible”, and another one “I’m very practical, pragmatic. I don’t want to do anything complicated. And if I do something complicated I must reserve it for the special tasks in the organization, not the basic functions”.

The third most important aspect is proven concepts. More than half of the interviewees believe in choosing for what they have experience with and they know that works, rather than for brand new technology. One of the informants specifically says: “If it’s not a proven concept, and it is part of a strategic way of thinking it’s a big risk. It costs a lot and there’s a lot that has to change”. They also advise: “Always go for old things if you can, not new. Go for the proven concepts. The ones we know work already”. On the one hand this is very sound and reasonable strategy, on the other hand there is no guarantee that a tested system in a different setting, with different people and culture will be used and thus perform in the same way.

6.3.2. Level 2 – Open mind

Regarding Level 2 of the U curve the most important aspect is team effort. This means that informants consider as effective and useful the dynamic of a team and its potential in the decision-making process. They say: “I believe in working in teams. When I don’t know the context I look for a team and organize some meetings. I try to create a safe atmosphere so people can be honest and advise you in an open way” and “What is important is that you make it possible for the employees to talk with the leader
and deliver ideas because people on the work floor know best how processes work. When you take the employees seriously in a changing process they are more flexible”. Another manager says: “We work very much as a team. I have a small team of 15 advisors, but also among the rest of the employees I listen to anyone who is an expert on a subject. It is very important to create an open atmosphere where people are willing to tell what they thing, to share, where it’s ok to say something completely wrong or to make mistakes, also in discussion”. It seems that bringing people together and exploiting the collective intelligence of the group creates a lot of possibilities in better understanding the environment of the organization.

Also, all the members of a team have a different perspective on the problem, which makes it easier to comprehend all the different aspects, effects and possible consequences of a decision. An interim manager says: “The best thing is to bring the internal and external people together so they can have a discussion and then make a decision. That’s the best way”, and a manager: “If it’s a complex situation, we need more brains, more input, different ideas and perspectives. Working with people, in teams, is ok, but with the right focus”. A quote also indicative of the importance of common understanding comes from an IT consultant: “IT project managers usually don’t talk to the outside world. They don’t want disruptions. They build a wall around them after they hear what the client wants. As an architect I try to look above the wall in these two sides and get them to talk”.

Next, an aspect that appears often in the data set is judgment, which is the obstacle that has to be overcome in order to move to the deeper levels. 60% of the informants have found themselves in situations where beliefs and propositions are filtered through colleagues’ own perspective, experience and reasoning. Equally effective is all the stakeholders involved to have the same understanding of the reality and problem at hand. An informant says: “If you have a strategy the most important thing is that everybody believes in it. Then you have positive energy. It’s the only way you can create things”.

On wondering about and understanding the reality a manager says: “It is important to have an open mind, to be innovative, outward oriented, to listen and understand signals and to understand that it is important to listen” and “An open mind is very important. Also it is important to be very curious. A
good leader should have three qualities: he should support the good in an organization, he should stop the bad – a lot of people don’t do that – and he should have an open mind, he should be curious”. These ideas are in line with the actions performed at the second level of the U, where people are receptive of different ideas and try to grasp the various perspectives of the matter at hand.

6.3.3. Level 3 – Open heart

The third level of the U is less represented in the data set and the number of occurrences is dispersed among the respective aspects. All the factors are mentioned too few times to deduce that decision makers are able to descent to this level. Some of the informants appreciate the value of listening openly to other people’s opinions and being reflective, imaginative and receptive of emotion. One interviewee says: “You have to follow your gut if something is really new and you don’t know whether it would be successful” and Additionally, only 10% of the informants have mentioned the significance of having and serving a certain vision for the organization and reframing, which is taking into consideration the underlying thought and rationale of a certain procedure in the changing process. They say: “If you use IT to change the world you have to have a vision, instinct about how the world might change. And how you want to play a role in it. Because it also costs a lot of energy so you really have to believe in it”.

![Figure 10: U curve - Level 3](image)

One manager summarizes in this quote the very essence of understanding all aspects of reality, together with the people that comprise it: “I think managers should be in touch with the people they work with, with reality, with the problems that need to be solved, with technology. Finally, they should be in touch with themselves, their feelings, and their personality”.

6.3.4. Level 4 – Open will

Regarding the last level of the U curve, one aspect is dominant and that is fear. Only two other factors corresponding to this level – wisdom/awareness and thinking of the future – are mentioned by 10% of the sample, while the rest do not appear in the data set. One informant says: “You have to follow your instincts, which may be a result of scientific wisdom or collective consciousness, intelligence as a
person, organization or society”. This leads us to believe that decision-making does not take place in this level and the vast majority of the informants descend to this level only to realize the enemy of fear and its dominance. According to the interviewees, it appears in multiple forms and prevents people from being honest, acting like themselves, speaking their minds, ultimately from exploiting all arrows in their quiver in order to make a good decision.

![Figure 11: U curve - Level 4](image)

**Figure 11: U curve - Level 4**

6.3.5. The enemies

![Figure 12: The enemies](image)

**Figure 12: The enemies**

In Figure 12 we can see the enemies that are encountered in Levels 2, 3 and 4 of the U curve: judgment, cynicism and fear respectively, and percentage of informants that related to them. It should be noted here that the names of the enemies were not used verbatim, nor were there direct questions about them. The enemies were associated mainly with examples and situations the informants described. Judgment has the biggest percentage, followed by fear and then cynicism. One would expect the reverse relationship between the latter two as cynicism is encountered prior to fear. This may indicate, apart from the fact that fear is a quite prominent obstacle, that the presence of cynicism is not realized or fully understood.

About judgment an informant says: “We like to think we make rational decisions. And that’s an obstacle I think. Of course your ambition has to have certain rationality. You have to be prepared to really analyze your ambition” and “What you often see is that if someone has a hunch, they try to rationalize it. They do a little investment and develop a proof of concept. “I like what you are talking
about, it makes sense, let’s do a proof of concept. Is it really true what you are saying? If you have a hunch that this will go well, prove it”. It is obvious that in many situations beliefs are filtered through the rationality of the group or colleagues and it takes a lot of effort to persuade them.

About cynicism an informant says: “A CIO should be a suspicious person, because ICT is still suspicious. However interesting and important it is still immature as a domain. ICT systems are often incomplete, have bugs and problems. So I cannot and should not trust anyone”.

Many situations that the informants describe are relevant to the enemy of fear. A consultant says: “If I do a presentation for 10 managers no one will say I don’t get the point. Because the others will think they are stupid”, “Many managers don’t make clear decisions. They look the other way because they like to be nice, to be the good boy or girl”, “One of the reasons they trust external consultants I guess is that if they fail they can put the blame on them”, “When you come up with something that is very original, all the fears are built into the ambition. We tend to be too careful but you only build new companies based on your visions”.

6.3.6. The U and public/private sector

As the informants are professionals in both the public and private sector, it would be interesting to compare the frequency of codes of each U level between the two sectors. As is obvious from the diagram below, codes of Levels 2, 3 and 4 are far more frequent in the public sector, while Level 1 is more frequent in the private sector. Informants argued that in the government and governmental organizations procedures are usually more formal, attentive to best economical value and fair treatment of all vendors, while in the private sector they are more liberal. However, the managers that work for public organization seem to be more conscious of non-formal factors.
In Figure 14 we can see the same analysis for other important factors. Here the variation between the two sectors for each one of these aspects is not significant. The most important, as identified previously, formal factors – budget, time and needs – as well as personal goals and personality seem to appear equally frequently in public and private organizational settings. Only politics seem to be more frequent in the public and time more frequent in the private sector.

6.3.7. The U and profession

In Figure 15 we see the levels of the U curve and their frequency in relation to the profession of the informants. Not much conclusion can be drawn from the diagram, as there is no specific pattern between the professions and the different levels of the U. However, what is worth commenting is that the consultants in the sample have not mentioned aspects that correspond to the third level. Also, the frequency of aspects of Level 2 is a lot less by consultants than by managers and interim managers.
7. Discussion and Future work

As in every research, there are points of this project that would need to be further discussed upon and improved in future research. In this chapter basic validity concepts will be discussed, along with action that has been taken to avoid validity threats. The criteria that will be discussed are presented by Bryman & Bell (2011) as appropriate for qualitative research and are: internal and external reliability, internal, external and ecological validity, and confirmability. We also comment on possible ways through which the matter of inquiry could be approached in the future.

External reliability related to the concept of replicability. Replication of the research would not be hindered by the specific choices that were made regarding the research strategy, data collection and analysis methods. Also, the coding scheme that was developed and used was described in detail, making it easy to understand which situations each code could be associated with. However, the purposive sampling strategy would create an issue for the replicability of the survey. Since it was not a probability sampling strategy that was used, it is possible that with a different set of informants the results could be altered.

The internal reliability of the research is quite high. It relates to inter-observer threats, which are not an issue for this project. All the steps, from research design, interpretation of the literature, to coding and analysis of the data, were conducted by a single person. However, the confirmability, or objectivity of the research, which is related to researcher bias threats, is low. As mentioned, all the analysis was done by one person only. This includes the interpretation and analysis of the transcripts and association with specific codes, as well as the interpretation of the U theory – which is originally developed as a leadership guide in general – regarding decision-making process in information technology related settings.

Regarding validity of the research, there is a number of points that have to be mentioned. First, generalizing is rather difficult, as qualitative research methods in “general trade generalizability and comparability for internal validity and contextual understanding” (Maxwell, 1996). It would not be safe to assume that the behavior reported in this project applies to all managers across sectors, social and organizational settings. It is also possible that managers in other fields approach such issues differently, based on specific characteristics of the subject, which means that external validity, or transferability, is weak. For example, as mentioned already, strategies regarding IT are considered difficult to change but, as an interviewee argues, it would be different in sales or marketing, where change is desired. However, the theoretical background that was used could be applied to other contextual settings and related decision-making processes.

The internal validity of the research, which relates to credibility, is quite high, as the data and results derived are in keeping with the theory discussed. Although the results show that a number of formal factors, which were not discussed in the conceptual framework, play significant role in decision-making processes, non-formal aspects are a big influence to IT managers. Also, it is important to mention there were no complicated concepts defined in order to approach the matter and extract information from the interviews.

The ecological validity of the research on the other side is strong, as the natural setting of the environment of inquiry was not altered in any way. Also, the research question focuses on managers’ perceptions and opinions. There is of course a chance that their ideas and thoughts could be different from the way they actually act in everyday situations, but this would be the subject of a different
survey. Observation would be difficult to use as a data collection instrument for decision-making processes. It would be applicable for a case study or multiple case studies over a longer period of time.

Additionally, the chosen research methods are vulnerable to threats of respondent error. The identification of important factors in IS decision-making can be realized through interviews, relying on the impartiality and sincerity of the respondents in order to consider the data reliable. Since observation cannot be used, the interview questions were formatted in a way to extract opinions rather than desirable answers as much as possible. For instance, questions were worded in a way that makes the respondents project their opinions on others and thus be more sincere, meaning that they were asked about what they think other managers do in similar situations.

In the future, the matter of inquiry could be expanded in order to identify possible correlations between factors or factors and descriptors. For example, the focus could be on differences in the influence of non-formal factors in relation to organizational characteristics, such as size, age or location. Also, the U theory could be studied specifically in IT organizations or in other fields and possible differences among them. The most influential factors identified here, could be incorporated in a quantitative approach with a much larger sample so that such correlations could be computed. In addition more demographic characteristics of informants could be used to identify possible differences in the way decisions are made.

Also, for future research, slight differences in the design could produce interesting outcomes. One of them is the introduction of the informants to the specific ideas described in the U Theory. It would be interesting to compare the results described here with the results when the interviewees have an understanding of the U curve a priori. Such analysis could also confirm the choice made here not to use the U Theory explicitly for the interviews as it could result in desired answers. In any case it would be interesting to see what situations people relate to and remember when actually coming across for example the words “judgment”, “cynicism” and “fear”.

8. Conclusions

After conducting all the interviews and viewing the matter from a number of different perspectives, the aftertaste is dominated by the fact that these kinds of decisions are highly complex. A number of different approaches are employed in organizations in an attempt to meet the requirements of a number of different stakeholders, with conflicting interests. A lot of compromises have to be made, as the goal for every organization is to maximize efficiency given a number of constraints.

As expected, an important part of managers’ attention and effort focuses on formal aspects and variations of the most standard procedure, as described by many of the interviewees. This process entails identification of the needs and expectations from the information technology to be introduced. It continues with finding the alternative choices, analysis of the options, pilot of the best alternative and finalization of the decision.

However, although procedures as the one described above are widely followed, a number of issues are encountered. A large part of the focus is on time and budget. A lot of the decisions seem to be taken on the grounds of budget availability and the cost of the alternative choices. This certainly limits the possibility of achieving the best outcome, but it is a real compromise that has to be made. This could also relate to the contemporary global economic situation. Companies across the world
primarily aim to cost reduction. In addition, time poses significant constraints in the decision-making process. Sometimes these constraints appear in the sense that the time available to make a decision is limited; also that at the time when the decision has to be made there is a specific set of options available. Also many of the informants view the introduction and use of information technology mostly as an instrument that helps reduce the operational cost in an organization. Finally, the belief that the introduction of information technology can help solve any kind of problems has come up and is rather abusive and misleading, in the sense that not only the technology is not being used to its fullest potential but also expectations are not met and people end up dissatisfied.

However, it seems that a number of different strategies are used in organizations in order to make decision regarding IT. The overall feeling is that even within the most formally and financially driven approach there is always room for influence by non-formal factors. It is not clear at which stage of the process this takes place or whether both formal and non-formal factors can be combined to produce better outcomes. Some believe that a balanced combination would serve best, others that they should be kept separated. In any case, non-formal aspects are indeed a big part of the decision-making process.

From the analysis of the data gathered, we can conclude that a large part of the sample is conscious of the existence of influences other than formal. A big part of these influences can be interpreted with the help of the U theory. Although the majority of the informants do consider aspects of Level 1 of the U important, they also seem to proceed deeper in the curve and acknowledge the existence and influential power of at least some of the aspects of Level 2, 3 and 4. There exists indication that IT managers and consultants could move towards a more holistic consideration of the matter. Some of the informants, when asked about their opinion on experience and its importance, argued that it helps but it might also be an obstacle. What really helps is being open-minded and receptive of new ideas and information, being in touch with people, with reality, with technology and ultimately with one’s self, feelings and personality. These are very encouraging thoughts, coming from people that are perceived as very rationally driven and plan oriented. It seems like another misconceived stereotype, as the IT world is indeed capable of bringing a different perspective to the table.

What remains to be determined is a way to practically and effectively incorporate the formal and non-formal part of the decision-making processes in one framework. This could help not only meet the time and money needs and constraints of a modern organization, but also exploit the unique skills and personality of people, which in every case consist an important part of the organizational environment. As organizations exist through their people, we might as well find a way to put their inherent, underlying knowledge to use.

In order to achieve that, there are still factors to be further analyzed and understood. The meaning and influential power of non-formal aspects that are not necessarily associated with the welfare of the organization as a whole should be further investigated. Politics, power, personal goals and ambitions are probably inevitable, but the effects, reasons and specific situations in which they arise and flourish could be analyzed. The least, managers should be aware and conscious of the influence these aspects exert.
References


Appendix A

Coding Scheme

- **Level 1 / Downloading**
  - **Architecture**: refers to organizational and information technology architecture that is used as a frame of reference for the actions taken, decisions and changes made in the organization. Builds on established systems and the relations between them.
  - **Comfort**: the feeling of comfort that is created and maintained by staying in the same organizational setting, in terms of functions, people or skills for a long period of time. It includes the feeling that change is difficult, complicated or dangerous along with unwillingness to engage in changing procedures. Being overly attached to comfort results in an inflexible and rigid design.
  - **Consequence ignorance**: there is little or no consideration of the consequences of a certain action. The decision-maker is more focused on the present that the future impact the change will possibly have on the organization.
  - **Experience**: refers to past experiences the informants have, memories, situations and decisions that have an effect on how they act at present time. Is related mostly to practical knowledge, which originates usually in exposure to certain events and situations. Alternatively could be named ‘remembering’, or ‘holding on to the past’.
  - **Learning disabilities**: refers to inability to recognize what we see, to see what we do, to say what we think and to do what to say. These are the *four barriers to learning and change* (Scharmer, 2007)
  - **Proven Concepts**: refers to systems and concepts that have been widely used and whose functionality and effectiveness have already been proven.
  - **Reacting**: refers to dealing with problems and changes that come along based on past experiences. Interpretation of the present based on the past
  - **The atom is the center**: refers to a point of view that originates in the center of the system.

- **Level 2 / Open mind**
  - **Curiosity / Wonder**: the ability and willingness to look for new ideas and perspectives in the surroundings, to view the environment with the goal to understand and learn.
  - **Holistic view**: refers to the ability to view the system from its outer boundaries rather than the center. Having a better understanding of the organization as a whole rather than a set of different parts that comprise it.
  - **Judgment**: the enemy that has to be fought at level 2. It refers to the tendency to view reality suspiciously, with a focus on own reasoning and rationality
  - **Redesigning**: refers to responding to change by changing the design, the functions of which the system consists.
  - **Share understanding**: refers to the notion of being in agreement with colleagues about the state of the organization. Having the same understanding about reality
- **Team effort**: refers to the importance of team effort in the decision-making process. Also, including more people in the procedure, thus taking advantage of the collective intelligence, collective consciousness and different perspectives that they bring to the table. Relates to a way of understanding a system by combining its different components, for example by including users or developers in the process of deciding for new information technology.

- **Understanding the reality**: refers to processes that are being followed in order to get a better understanding of the reality that develops in and forms the organization.

### Level 3 / Open heart

- **Cynicism**: the enemy that has to be fought at level 3. It refers to being doubtful, skeptical, distrusting towards other people’s beliefs and opinions.

- **Emotional perception**: the ability to use emotion as an aid in understanding people’s intentions, reactions and the influence they have on the whole system.

- **Imagination**: refers to the act of employing one’s imagination in order to form an idea of the organization’s future.

- **Listen / Reflect**: refers to the ability to listen openly to other people that comprise the internal and external environment of an organization and being able to incorporate their opinion in personal reflection.

- **Reframing**: refers to responding to change by altering the thought process and rationale underlying specific choices, processes and operations in an organization.

- **Vision**: refers to what an organization would like to accomplish in the future. It serves as a guide in forming current and future business strategies and achieving certain goals.

### Level 4 / Open will

- **Dare**: refers to the act of overcoming or fighting the fear that appear at this level of consciousness, the ability to prevent the fear from determining one’s actions and decisions.

- **Fear**: the enemy that has to be fought in level 4. It is created by a perceived threat, which in this setting usually presents itself as fear of not being recognized, fear of being perceived as unworthy or stupid, fear of change, fear of failing etc.

- **Inner knowledge**: refers to the knowledge that develops as a combination of understanding both the surroundings as well as the inner part of one’s self.

- **Living in the present moment**: refers to the state of perfect understanding of the reality happening at the present moment.

- **Think of the future**: the developed ability to think of the future potential of one’s self or an organization and to make decisions based on it.

- **Wisdom / Awareness**: refers to the ability to be conscious of and deeply understand people, events and situations and utilize this knowledge and perception to guide one’s actions.

### Culture

- **Culture**: the culture of the organization at hand, which is formed by the values, norms, symbols, beliefs and habits of the people that comprise it. Include a shared mindset that guides the people in their everyday interaction with each other, customers, suppliers, partners etc.
• **Personal**: this set of factors refers to characteristics that inherent and distinct for every individual that can be involved in a decision-making process.
  
  o **Personal goals**: refers to the personal goals people have for their own career, welfare, development and personal accomplishment.
  
  o **Personal preferences**: personal judgment in terms of liking or disliking a certain object, situation or person.
  
  o **Perspective of the world**: personality and experience that result in a distinct way of perceiving the world and dealing with the challenges that come across.

• **Politics / Power**: refers to the inclusion of social relations and power in the decision-making process. It entails the act of being influenced towards as well as influencing others with the respective decision, by taking advantage of positions of power.

• **What others do**: refers to the tendency managers have to be influenced by what other companies, mainly leading or successful ones in a specific field, do and choose for. Also includes the factor of avoiding choices that for other organizations proved to be a mistake or failure.

**Formal**

• **Budget / Cost**: refers to the budget that the organization can afford and is willing to dispose for the purchase of a new system. Also relative to this factor is the cost of the choices that are available, the eligibility of which can change is sight of the specific budget of the organization.

• **Choices available**: refers to identifying and narrowing down the options that meet the needs of the organization.

• **Financial assessment**: refers to formal ways of assessing an information technology investment and includes a set of factors such as quantified value of information, return on investment, maintenance savings etc.

• **IT as an instrument**: refers to the role of information technology as a tool supporting the implementation and execution of the business strategy. In this case the IT strategy and architecture and formed primarily at the operations level of the organization.

• **IT as drive of change**: refers to the role of information technology as the driving force of change in an organization. In this case information technology enables the formation and development of business strategies.

• **Knowledge**: refers to theoretical knowledge of the people in the driving seat of decision-making processes as well as their advisors and consultants. In the specific setting could relate to knowledge about technical aspects, IT governance, organization theory, IT architecture, change management etc.

• **Needs / Necessity**: refers to identifying the specific needs that dictate the introduction of new information technology in an organization, as well as whether this is considered absolutely necessary or not. This code also includes the notion of understanding what needs to be changed and what needs to be preserved as it is.

• **Open source**: refers to decision-makers being affected by whether IT systems are proprietary or open source.
• **Organizational level**: refers to the level at which the decision is being made. Could be the operational, management or higher level of administration.

• **Size**: refers to the size of the organization in terms of employees. Researchers argue for as well as against size affecting the structure and complexity of an organization.

• **Skills / Competencies**: refers to the skill set that the people in an organization possess. In the specific setting relates to computer skills, familiarity with information technology as well as ability and willingness to adapt to new IT related circumstances.

• **Stakeholders**: refers to the consideration of multiple stakeholders associated with the organization and the, usually conflicting, interests each one of them impose on the decisions made and actions taken. Could include employees, customers, partners, shareholders, line managers, executives, community, natural environment etc.

• **Time**: refers to the time that is available for the organization in order to make a choice, realize a certain program, fulfill the goals of a project etc. In this setting it is usually associated with pressure and lack of time. Also relates to having the right timing, making the right decision when an opportunity presents itself.
Code Application

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Code Co-occurrence

In the table below rows and columns represent the coding scheme. Each cell represents the number of times that the respective pair of codes co-occur in excerpts.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | Organizational level | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Personal | 6 | 4 | 3 | 1 | | | | | | | | | | | | | | | | | | | |
| 3 | Personal goals | 6 | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| 4 | Personal preferences | 4 | 1 | | | | | | | | | | | | | | | | | | | |
| 5 | Perspective of the world | 3 | | | | | | | | | | | | | | | | | | | |
| 6 | Needs / Necessity | 1 | 1 | 2 | 1 | 1 | 4 | 1 | 1 | 2 | 1 | | | | | | | | | | | |
| 7 | Level 1 / Downloading | 2 | 14 | 1 | 14 | 1 | 6 | 2 | 3 | 6 | 1 | 5 | 1 | 2 | | 2 | 1 | | | |
| 8 | Comfort | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Consequence ignorance | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Experience | 1 | 14 | | | | | | | | | | | | | | | | | | | |
| 11 | The atom is the center | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Architecture | 6 | | | | | | | | | | | | | | | | | | | |
| 13 | Learning disabilities | | | | | | | | | | | | | | | | | | | | | |
| 14 | Reacting | | | | | | | | | | | | | | | | | | | | | |
| 15 | Proven concepts | 6 | 1 | 2 | | | | | | | | | | | | | | | | | |
| 16 | Knowledge | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| 17 | Level 2 / Open mind | 2 | 4 | 5 | 1 | 2 | 1 | 1 | 4 | 7 | 1 | 8 | 23 | 6 | 5 | | | | | | |
| 18 | Curiosity / Wonder | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Holistic view | | | | | | | | | | | | | | | | | | | | | |
| 20 | Judgment | 2 | | | 1 | | | | 1 | | | 7 | | 4 | 1 | | | | | |
| 21 | Open mind | | | | | | | | | | | | | | | | | | | | | |
| 22 | Redesigning | | | | | | | | | | | | | | | | | | | | | |
| 23 | Share understanding | 1 | | | | | | | 8 | | | | | | | | | 2 | 1 | | |
| 24 | Team effort | 4 | 1 | 2 | 1 | 1 | | 1 | 23 | 4 | | | | | 2 | 1 | | 1 | |
| 25 | Understanding the reality | 2 | 1 | | | 6 | 1 | | | | | | | | | | 1 | 1 | 1 | |
| 26 | Level 3 / Open heart | 1 | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 |
|       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 27    |   |   |   |   |   |   |   |   |   | 2  | 1  | 1  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 28    |   | 1 |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 29    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 30    |   |   | 1 |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 31    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 32    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 33    |   |   |   |   |   |   |   |   |   |    | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 34    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 35    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 36    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 37    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 38    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 39    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 40    |   | 2 | 2 | 4 | 3 |   | 1 | 3 | 1 |    | 4  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 41    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 42    |   | 1 | 1 | 1 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 43    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 44    | 1 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 45    |   | 1 | 1 |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 46    |   | 2 | 2 | 1 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 47    |   | 1 |   |   |   |   |   |   | 2 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 48    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 49    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 50    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 51    |   | 1 | 2 | 2 |   |   | 1 |   | 1 |    | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 52    |   | 1 |   |   |   |   |   |   | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

(Continuation)
(Continuation)

|                        | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | Totals |
|------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|
| 1 Organizational level | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 9     |
| 2 Personal             |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 16    |
| 3 Personal goals       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 10    |
| 4 Personal preferences |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 5      |
| 5 Perspective of the world | |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 3      |
| 6 Needs / Necessity    | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 22     |
| 7 Level 1 / Downloading| 4  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    | 83     |
| 8 Comfort              | 3  |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 31     |
| 9 Consequence ignorance|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1      |
| 10 Experience          |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 26     |
| 11 The atom is the center | |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 4      |
| 12 Architecture        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 9      |
| 13 Learning disabilities|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2      |
| 14 Reacting            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 6      |
| 15 Proven concepts     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 11     |
| 16 Knowledge           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 4      |
| 17 Level 2 / Open mind | 2  | 1  | 3  | 1  | 1  | 3  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 93     |
| 18 Curiosity / Wonder  | 1  |    | 1  |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 13     |
| 19 Holistic view       |    |    |    |    |    |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1      |
| 20 Judgment            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 18     |
| 21 Open mind           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1      |
| 22 Redesigning         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1      |
| 23 Share understanding |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 13     |
| 24 Team effort         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1      |
| 25 Understanding the reality |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 17     |
| 26 Level 3 / Open heart| 3  | 2  | 5  | 4  | 1  | 5  | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 40     |
(Continuation)

|                | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | Totals |
|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|
| 27 Cynicism    | 1  | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 11 |
| 28 Emotional perception | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 6  |
| 29 Imagination |    | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 7  |
| 30 Listen / Reflect | 1 | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 16 |
| 31 Reframing   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2  |
| 32 Vision      |    | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 7  |
| 33 Level 4 / Open will | 1 | 1  | 1  | 2  | 5  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 16 |
| 34 Dare        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 35 Think of the future |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 36 Wisdom / Awareness | 1 | 1  | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 10 |
| 37 Fear        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 5  |
| 38 Inner knowledge |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 39 Living in the present |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 40 Budget / Cost | 1 | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 31 |
| 41 Culture     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 42 Choices available |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 43 IT as drive of change |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 44 IT as an instrument |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 45 Size        |    |    |    |    |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 46 Politics / Power |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 7  |
| 47 Financial assessment |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 4  |
| 48 Open source |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 49 Skills / Competencies |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 5  |
| 50 Stakeholders |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 51 Time        | 1  | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 16 |
| 52 What others do |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 3  |

43
Interview guideline

• Have you ever had to choose for new information technology for an organization?
• What practices do you usually use to come to such a decision? Can you describe them?
• What practices do you think managers usually employ to come to such a decision?
• What information is crucial in such a decision?
• Do you think that managers have all the information needed to make such a decision?
• How important is experience in decisions regarding information systems?
• Is it easier for a manager who has made relevant decisions in the past to succeed in the future?
• Do/Should other people participate in the decision-making process?
• Do managers discuss these matters with colleagues?
• Is it easier to form a decision in a team or individually?
• How do you assess the current state of your organization?
• How does new IT affect the whole of the organization?
• What is usually the expectation after implementing a new information system?
• What do managers do to picture the state of the organization / the process / the benefits after the implementation of new technology?
• Do you think that taking such decisions can be made “following you gut”?
• Do decisions regarding IT and infrastructure differ from other kinds of decisions?
• What obstacles do managers encounter when making IT related decisions? Where do these obstacles come from?
• Is making decision intuitively considered a legitimate way? Are there problems?
• If a manager makes a decision intuitively do they encounter any problems? What is the biggest obstacle/problem?
• What is the issue when someone makes a decision “without thinking”?
• Do you think that managers are able to let go of the past?
• From your experience, what advice would you offer to other managers facing similar problems?
Appendix B

Interview 1

(Consultant, Private sector)

Can you tell me a bit about your connection with IT?
I’m a consultant and working with the department called IT services and it’s about IT infrastructure for the whole organization. They serve all kinds of infrastructure and they do that by themselves and with [company x], a large vendor with services, hosting etc. And what you see over here is an interesting part. I’m working at the PMO department (Project Management Office) and we are trying to standardize some processes. And it’s interesting stuff because even management are jumping around, they hear something, they find it interesting and want to look at it. And then everything has to be changed and everything goes around because it is something new and it is difficult to get them into processes and organization. With the organization it’s challenging. I’m here three months and it’s a challenge because there is a lot of informality, also with management. It’s a challenge to standardize the processes and to keep them that way. That’s kind of what is going on over here. Governance is not the strongest point. This organization has a lot of history. There have been merges, separations, so it is always on the move. Other companies had to put in other systems, combine them, develop new systems. And it’s quite a challenge to keep up. And the PMO is now looking at the workplace and workplace devices until 2020. We have a spectrum of almost 10 years. So, how an employee will work in the year 2020, what will they need, what the devices will look like, “bring you own device”. That’s a quite interesting point of view and interesting spot in the horizon.

So we are looking from the perspective of a consultant.
I can do both I guess. I’m a consultant but I have information about the organization, I know how it works.

From your experience, what is the process that managers follow when they want to choose for an information system?
First they have programs, and there’s a lot of projects and views regarding security, connectivity, UI working, working from other places, design, so there’s all kinds of architects, also brought together in some boards, business analysts and business architects to establish and design an architecture, and to maintain an architecture. So in management we also have to consider architectural principles and views that have to be combined sometimes. So they are looking at new technologies, new improvements, they have to consider the programs, projects and the architecture. But to my point of view, I recognize that there can be some “I’ve been there, I’ve seen that, we should look at it, we should try it”. It’s impulsive sometimes. And not always considering what the consequences could be to the programs or to the architecture. Sometimes it means hurry up, having an opinion about it, have an answer back, to management. This is what you mean, look at it, or give us some time to come up with an answer, to research and look into it. And then go back to management. Sometimes it looks impulsive. And it’s mostly people in the higher ranks that are impulsive. We try to get them into processes and programs but sometimes they are impulsive. It happens, and in my opinion most of the times even the business is
impulsive and say we need that technology, not looking at the requirements, why do they need that, what they should do, when, look at the possibilities. They just say we need that application. You don’t need that application, you need that functionality, and why do you need that functionality, what should it do. Are there other requirements? Just look at that, and then come up with a solution. That’s the tricky thing about being impulsive, that they already have the solution.

In these situations do you think that experience plays a role?
I think it’s experience and it’s also ranking. Having a certain rank gives you the power to say something and get it done. So it’s rank and experience. But this doesn’t mean that it’s always good for the organization, or that it’s good for the programs that are running, or the architecture. They are like “that is what I saw and that is what I want... the red over the green version”. I think in small organizations you can do that, but in big organizations you have to consider a lot of things and it’s not always smart to do so. The bigger the organization, the bigger the change, the more dependencies there are and that have to be considered. And I work at the PMO so we have to look at these dependencies and the influences on each other.

So, when they want to decide about something, is it easy to gather all the information needed?
The way I see it, there comes the point of experience. You need experienced people, employees that have a lot of years of experience in the bank who you can ask the questions to. And they have it all in their heads, the experience to come up with the answers, or to come up with comparisons etc. and you rely on those people. That could be the situation here. [Company x] is a large vendor with a lot of knowledge. So you need to consult the vendor to get some answers or comparisons etc. You have to fall back on some reliable, very experienced people. And they are few, and that sometimes can be tricky, because everybody is asking these people. So you have a resource problem, because they know a lot and are asked a lot of times. And you have that in your organization, but you also have it in the vendor’s organization. And of course you get your information, but you rely on some people who have the knowledge, who have the experience. You always fall back on those people. And that is a pity. If you do that informally you never get the chance to condense the knowledge, to make sure the knowledge is in process, in documents, or a knowledge base. That’s now going to happen. So you rely on the information from those people. And you try to standardize it but it is difficult.

What factors play a role in assessing the state of the organization?
Sure they look at skills, competences of the people that are in projects, in programs. That’s one factor. But sometimes I think also they handover to the maintenance organization for a project, we call it business as usual, and it has to do the operations every day. They handover to that and every project becomes very tight. So it is not always clear what acceptance criteria, or what needs to be done to hand it over properly. So I think most of the times projects are started without knowing exactly the acceptance criteria, or what criteria to hand over are in place or should be in place. So just looking at competences and skills is not enough, even though this is what they look at mostly.

Are these decisions made individually or in teams?
I would say both. Perhaps the initial idea or signs can be individual, but then it is done in teams. If you have to go to an architect of the board and ask can you implement this, how does this fit in our architecture, it is in teams that you decide changes in a program, it’s always in boards.

How easy is it for the board to come to a consensus?

Sometimes difficult. And then you see there’s a lot of political things and a lot of political relationships between employees.

Do you think that intuition is a legitimate approach to making decisions? Does it produce good outcomes?

I think yes. And that comes from my experience in information management. I think it is good, because business wants to change very rapidly and what you see in large organizations is that they have difficulties with keeping up. Because they have large systems, decision-making processes etc., but business wants to change quickly, so sometimes business makes the wrong decision quickly in order to have a quick result. So coming up with ideas and solutions to better support business is a good thing. So not being harsh is a good thing. But is has to contribute to the business. And sometimes they don’t have exactly an idea of what the business wants. Thinking for themselves, they see developments in technology. But to have a real conversation and collaboration with the business, not always. So I think it’s good to have some responsiveness, to be agile, but at some point you have to stick to the plan, to the architecture. And it does not account to all your IT competences. You can have some applications, that don’t change. If the process and the information don’t change for years it is ok to have that kind of processes and architecture. But if you have a marketing or sales department that want to change and try things, that’s another infrastructure, another solution, another way of working to support that kind of business. So you have to differentiate in your IT to support it. Sometimes they should try not to be holistic, and try to differentiate.

Do people have this holistic view?

That’s about experience, because they run a business or they run a company for years and they have a lot of experienced people, the people you want to question… they have a kind of pattern. They are comfortable to stay in that pattern. It’s hard to change, but sometimes they try to have a holistic view. But you don’t always need a holistic view. It’s difficult sometimes to make people come out of that pattern and change their minds.

Does business consider impulsivity legitimate?

That depends on the business. In a financial department they try to stay in control. If you have a sales or a marketing department they want to change everything and it must be done today.

What about in IT?

Yes. They want to have the IT changes yesterday, not today. And that requires another kind of support, another kind of collaboration. And you have to deal with that as well. And as an IT department becomes large, agility becomes weaker. That’s a disadvantage of large IT departments.

So, decisions about IT are different from other kinds of decisions in an organization?
Yes, they are.

*When someone is prone to being impulsive and intuitive do they encounter any obstacles? From their environment or colleagues?*

Yes they do. I’ve seen that sometimes and it takes a lot of discussion. Catching up, collaborating, discussing. And that takes time. We can’t say that it’s a waste of time because it is a process they have to go through altogether. Share the same ideas, the same views. Sometimes it is successful but it takes a lot of time. And yes they do find obstacles. It’s a give and take situation.

**Interview 2**

(Manager, Public sector)

*Have you ever been in a position to choose for an information system?*

Yes, multiple times.

*What processes do managers follow when they want to choose for an information system?*

Basically, you find out what is necessary, in terms of requirements. So you have to talk to the people who are going to use the system. And I always ask them to write something like a business case. It is very difficult to define what rational is. It’s more like you have some level of objectivity and everything else is rather subjective, according to your purposes. And everybody has a different perspective, purposes and principles. Especially when I look at the organization one of the difficult things always is that we are a rather small organization and it is not possible to look at the whole world market, all the tools that you could choose from. And as far as you are looking you are mainly looking at the English speaking world, which is just a part of it. Especially if you are looking at the most specialized tools. They usually do not hit the global market, but are available in colleague other institutions that do the same job. So that’s one factor. You cannot know what the market has to offer. It’s way too big. Of course you can hire Gardner for analysis of all kinds of things, but it would be very expensive for a small organization in a specialized market. We do have professional communities where we exchange a lot of knowledge. So that is one of the ways to do that.

The second thing, what you have to find out is if it is really necessary. That’s why you try to write the business case. How often do you need this tool, what are you trying to gain. The revenues side for these kind of institutions is rather complex. So it is difficult to define the cost, because we only can compare alternative costs. The revenues are very difficult if they are not in the business context. From the past when everything that helps should be done, we don’t have unlimited funds so we do have to make choices. And that is not very rational process I think. It is also a matter of opinions. What usually helps is that we don’t have unlimited budget so we make choices within the budget. But it is a difficult one, because the choices are not presented at one moment in time, but throughout a year. You just have to do what you think is right at that time.

And of course another factor is that for example in my department there are people who can build their own tools. And have built their tools in the past. You have to make choices whether you do something yourself, whether you try to find a solution in the market, or that you try to inspire a private party to build something that you would want to use. So you have to make their business case, saying that this
is a very special market, but we are not the only client. Could you develop something that we could buy? And the government gets a lot of things done in that way. For instance, giving small IT companies the opportunity to build a tool to be used by multiple parties within the Dutch government. Giving it to them they create their own market. On the other hand we found out that this is not always successful because once they start serving these other markets, will they still serve us in the way that we want it? Because the Netherlands in our area is quite advanced, we find that it is much more interesting for them to sell the knowledge abroad and earn money from services provided instead of keeping the R’nD with us. So we recently took a decision to replace a commercial proposition and again building ourselves a solution. You try to make that as objective as you can but of course my researchers have their preferences. You can’t help it. It is partly because it is something that you’ve done and you know inside out, you are proud of it. You always want to keep that and evolve it further. And even when using external tools people have their preferences. Something that you are used to is always easier than something new. And also other almost ideological discussions like open source etc. That sort of discussions I have less with my researchers because they really want to look at the technical values of things but if you go up in the hierarchy some of these people, not having a lot of technical knowledge but at least the feeling of the opinion of themselves that they know something, have opinions about open source and architecture. And sometimes they cannot distinguish between the two. That makes thing a little bit complicated.

*Do you think managers have all the information that is necessary at their disposal?*

I think that a lot of manager in the Netherlands and not just in the organization that I worked, know too little about information. I don’t say IT because I don’t think you have to know a lot about IT, but you have to be able to think in terms of information, because it’s one of the major assets of any company nowadays. I think it’s a pity that we don’t capitalize our information assets in the financial reporting of companies. And I know it would be a very difficult thing to attach an amount to an information asset. On the other hand we do it for other things as well. You also find it in merges and acquisitions. Of course the architecture and information assets play a major role in assessing the worth of a company. At that time we do value these things but we don’t do it in our yearly report. If we would make a better estimate of the value of our information assets we would have very different discussion for instance about security. Because now security only costs money but we don’t take into account the value of the things that we are protecting. That really is a problem. Every management team has to go through a course like “finance for non financial managers” and if you would google that term you would find 300.000 hits at least about different courses provided worldwide from 3 days to 3 weeks. But if you google “information for non information managers”… We really have a problem. We needed a course for the general managers about information management. Because in the end they have to take positions about information and they are not qualified to do that. They can’t think in terms of information, they can think in terms of money and people because that is what they are trained for. But information is still rather badly developed in management.

*Do managers make these decisions in teams or individually?*

At the organization we have 8 line departments with different research focus and we take a lot of our decisions rather individually, only talking to the CIO. My department has its own IT environment so
we make a lot of those decisions ourselves, as long as they are in the budget. The last couple of years we have instituted a steering group to have at least some sort of shared vision about how the information strategy should develop. The focus is on the project portfolio and on using the restrained budget that we have. It’s mainly because we have to make choices, because there is little money that we have to discuss what we are doing. Otherwise I don’t think there would be a lot of discussion.

*What about within the department?*

Of course you have different kinds of systems. A lot of our systems are sort of production technology. And if you have a group with their own production process they do need their own technology. They are prepared and have plenty of knowledge to do that. So they make their own decisions. Or at least they prepare their own decisions and if they need money or formality they come to the management. Basically they do most of it themselves. If you talk about company wide systems, like financial and registration systems, then there is more cooperation and you have to discuss it. But because these supporting systems don’t have a high priority for the departments and nobody thinks its really interesting, it is usually difficult to get into discussion, only if afterwards it turns out that things are not very good or if it is not very user friendly then of course you get complaints. But if it’s about the financial system, let the financial department decide it and only those people can use the system. I don’t want to decide about the financial system, it is not my profession. Only on the level that you have to put priorities in you budget, then you have to have a good discussion. What is important and why, but not content. I would like to have a discussion in the top about architecture and how it relates to strategy. We had an internal MBA for line managers because most of them have a background in specific science but not in management and I tried to get a module about information but they were not interested. It was not important enough. But I think that if you do not have a good information environment you will not be efficient and it could help develop our knowledge much faster. We have to prepare for the future. Within my digital department we can do much more. We are now investing in developing a new system, which will help us deal with the environment. We need a lot more storage capacity for our processes and there are no standard solutions for those kinds of things in the market. We have to look at the technology that for example Google uses and we are doing that. One of the decision that have been made is to invest in these developments and because it is so big and expensive, we decided that it is too big for the organization so we have to find partners and we are talking to a lot of partners which makes the decision-making process much more complicated but we just have to do that. It is bigger than we can handle. And there’s a lot of politics of course. Whether rational or not I couldn’t say but if you are within the government and have to cooperate within the ministries it becomes very complicated because it is not clear who is finally responsible for the system so you have to take a lot of time and have a lot of discussion about governments and who is responsible for what and why. And different parts of the government have different kinds of regulations. If you want to share technology or even more, data then it can be very complicated. You could change the law if necessary but there are people who don’t even want to go there because changing is such a complicated process. So it is also about how motivated are you to create something. How much energy do you want to invest in creating a change?

In IT a see there are tow approaches. The one is ‘IT is changing the world’ and we want to recreate our company or institution using IT, it’s a high ambition, it’s difficult, it involves a lot of change
management, a lot of politics etc. For me that is the most interesting. On the other side there is a lot of IT departments waiting for the business to define what they want and then they will build it, or buy it. Much more passive. And this way is difficult, maybe more difficult because you will never be able to satisfy the business. You will always be too late. It will always be too complicated because they have to decide the things that they cannot oversee the consequences. It’s a killing attitude but you still see a lot of it. It’s like swimming and trying to survive as an IT department. But I don’t think it is very successful. You have to look at the enterprise architecture at the level of the business strategy, not on the operations. Classically it is a business strategy and then detailed into a lot of actions and then they define what IT you need to support those actions. And then having done all that, you try to do something like enterprise architecture by connecting the dots. You should have an enterprise architecture that supports your strategy. For me that is a very logical connection. The enterprise architecture provides the basis for whatever you want to do as a company. So if it’s not up to supporting your strategy it’s hardly possible to ever realize it. That’s the level we should be talking about. The information environment, the organization and the strategy should be developed at the same time, with a shared vision. And then you can be successful.

In sight of this change that IT brings to an organization, how do we assess the state of the organization? How do we find what effect can IT have?

Well, we do need architecture. Not only architecture of the IT systems but also of the organizational systems. The strange thing that I found is that enterprise architects, do not architect the enterprise, they only describe the enterprise so they can architect the IT. And in describing they don’t use anything from organization theory. Most of them don’t know anything about that, which has developed for more than a century. And there has been research about what is effective in an organization. The way you componentize an enterprise has a lot to do with the way you should organize your IT. Because the way you structure your organization also means that you decide what will be the working area of people making decisions. Those people will also make decisions about IT. In our organization we have a lot of silos. And because it is organized like that everybody will want to make their own IT decisions because they are held responsible for the management of the silo and it is always difficult to get things coordinated except when they are not very interested and clearly don’t have a lot of impact on the profit of any of these silos. Only on general cost level. The way the enterprise is organized is very decisive about the way IT is organized. Somehow the connection is lost though.

Do you think that experience is important in order to make such a decision about IT?

It might help, but it might also be in the way, because IT is changing so much that a successful decision 10 years ago might be totally irrelevant now. You have to keep up with development. I don’t mean that you have to know exactly how the technology works but you have to understand what it does. For example you can try to compare everything to cars, then people understand what you are talking about. If you took a decision about transportation about a century ago it would be different now because the technology has changed so much. And even now we are changing it. Now we have electric cars and if you look ten years ahead it may change again. Maybe we won’t even drive cars because our computers will do that for us. So technology changes the content of the decisions. Experience might help you to get a feel where the pain is in the decision-making process. That is much more an experience thing.
How people relate to this process, what are their interests, why do they react in a certain way. But to find out what the right decision is... I think sometimes very inexperienced people know that. Their problem is that they are right but they are not given the success because they don’t know how to play the game. It’s very interesting to have a combination of experienced people and younger people in these kinds of groups. I always try to have some very young people at my staff, with recent knowledge. Age does not matter in that aspect, in technology. In this software company that I have the CTO is older than I am but he is always on the edge, he follows everything that happens in the technology field. Age is not an issue there. It’s how you think. Sometimes people think that those who come right out of university have the most recent knowledge. But there are people who keep up during their whole life. Also at the organization, I have some top investigators who follow up everything in the field. They always work. At home they read everything on the Internet, try everything. That’s also important. Experience may help you in the technology field to cut the unnecessary a bit, but not much. A couple of years would be enough. Experience is more important in playing the game, getting results. Usually I like to be advised by my people on what should be done and I help them to create a story, presentations, or how to present this, who to talk to first and who to talk to second, where to get money to do things. There experience does help.

Do you think that these decisions can be made following your gut?
You have to follow your gut if something is really new and you don’t know whether it would be successful. I remember first about the ideas about sms messages. Market research didn’t help because nobody understood why it would be useful. So some people really followed their gut and took the decision to proceed on it. If technology is really new people cannot say whether they will use it. They just imagine using it. In all technological breakthroughs somebody had to have that feeling that somehow this is really good. When the banks started with the cash machines market research said that people would not like using it and the banks said maybe they don’t like it but it will be efficient so we will do it. Now of course everybody uses it. If something requires a change in behavior you have to have some beliefs to support the investment in it. If it caters into existing problems of course it is much easier. Then you say we have a problem and this is how we are going to solve it.

Is this intuitive way legitimate?
You don’t have an alternative. It comes back to these two ways of doing IT. If you use IT to change the world you have to have a vision, instinct about how the world might change. And how you want to play a role in it. Because it also costs a lot of energy so you really have to believe in it. On the other side, if you use IT to solve problems then you have business cases on that sort of thing, a lot of discussions about how to solve the problem and if you solve the problem everybody will be happy. That is the easier process. We were having these discussions in the 90s with the consulting group in the company I was working. They were saying that if our client needs something we can listen to what he needs, to what his problems are, we can help analyze these needs and then we will advise a solution. The problem is we said, in e-business they don’t really know what they need. They are not aware of the possibilities. So we don’t have to start the process by listening to the client, we have to start the process by providing them dreams and images and a vision of the world. That’s a very different process. In the Netherlands we were allowed to start this, but in the UK the consulting group was able to stop the
development there. That was a pity I think. We organized workshops at that time for management teams. We were discussing one time about how the Internet would change our world. That was not a rational discussion. It was showing them by using a website, also by using an actor to show them something in a different way, and having all sorts of discussions. Like, would you buy a perfume across the Internet? And then see what happens in the discussion. The purpose was not to create knowledge. It was much more to create this gut feeling, intuition about what might happen. They would need that to create their own ambitions.

What are the obstacles one might encounter in this process?

We like to think that we make rational decisions. And that’s an obstacle I think. Of course your ambition has to have certain rationality. You have to be prepared to really analyze your ambition. But the power of these ambitions does not come from the rationality. If strategy were a rational process everybody would be doing the same. And it would not be a good strategy. Strategy cannot be rational. If you have a strategy the most important thing is that everybody believes in it. Then you have positive energy. It’s the only way you can create things. All these things ‘is this the rational thing to do’ is energy that is lost. And you always come out with something that is not very original, all the fears are built into the ambition. We tend to be too careful and you only build new companies based on your visions. Of course it’s not easy and things will go wrong. Also this company that I had, it started in the end of 1999, in 2001 we almost went bankrupt, we just managed. We had to let a lot of people go. Then we started building again, but we did have a dream and because of this dream we stayed together. A lot of people back then built companies purely because they thought they could earn more money, without a lot of vision and in 2001 these companies went under. Financially we had a tough time but because we had this shared vision we wanted to stay together, we wanted to realize our vision. That was the basis for the following process. And now with about 20 employees, it’s very profitable. If we didn’t have that vision then we wouldn’t have created this. And the problem with larger companies is that the larger the company, the more difficult it is to have this vision. You need very strong leader for that. Especially the government has very little vision. It tries to react to everything that happens in the media. It has to be reactive by nature and it does not help.

What would be your advice towards a manager in this position?

I think that every manager has to be aware of information, about the value of his information assets. He has to have a vision about further development of IT, especially about changing the world, because it will. If he is reactive he will just be too slow. He has to do reading, he has to have discussions with his colleagues, think about how to change the company, like in the workshop we had that discussion about how Internet would change our business world. And it has changed tremendously especially if you look back what happened in the last 50 years, it is enormous. 20 years ago I was responsible for a call center, we didn’t have Internet, we had problems with our technology because of bad weather, a thunder had hit our telephone system, so we were out for a week. We had to go to another company to work from. People had to do everything by hand. There was no IT. It’s unthinkable now that we could even work that way. It was only 20 years ago. So if you want you company to survive for 20 years in the future, you have to think into the future and not only react on the problems of today. And it’s not easy but it can also be quite fun. Try to find a direction. It’s not a plan; it’s a strategic intent. A rough
image about where you want to go. And you have to be prepared to discuss it over and over again because the world is changing. And I think that IT is at the bottom of a lot of that change. It is changing our world.

Interview 3

(Manager, public sector)

Have you ever been in a position to choose for an information system?

Yes, often. Most recently I chose [system x], which it is a collaboration system by [company x]. There are a lot of other systems in that area and there is a debate in the Netherlands and also in the government about which system to choose. You can have open source systems, even made within governmental organizations. Market leader is now [system x], which of course has the disadvantage of being a proprietary system of [company x]. And also has the potential advantage of a system that will be widely used in society and by consumers and citizens in the future. So it was not difficult for me to choose it because I make a very simple decision - in a way disrespect most rational decisions. [system x] is the market leader, it is put by Gardner as the best option. The workforce of the organization they have to work with this system to collaborate and it is essential that, since they have very different academic backgrounds, they have a widely used and understood system. I can’t afford to choose hi-tech open source systems to which they would have to adapt etc. It must be simple, it must be widespread, it must be connected to all sorts of things. In some organizations people make quite an issue of these sort of decisions. From an ideological perspective we should choose open source. But I make decisions very simple. I do not have in any way warm feeling for [company x]. But for me it’s very practical, pragmatic. I am a follower in the ICT market. I don’t want to do anything complicated. And if I do something complicated I must reserve it for my special tasks as an organization, not the basic staff, like document and financial systems. Support systems must be simple, solid. So I chose to standardize on [systems x]. And for the next five years this is the most simple choice. After five years hopefully there will be other large systems from competition and make it cheaper or more efficient. In other areas digital safety is important. As a CIO I am a suspicious person. By profession a CIO should be a suspicious person, because ICT is suspicious still. However interesting and important it is still immature as a domain. ICT systems are often incomplete, have bugs, problems contrary to cars or electricity systems. Those are complete, they are tested. People panic if there’s something wrong, but with ICT systems it is normal if something is wrong. ICT is immature still. And therefore as a professional dealing with ICT the CIO should be suspicious. However nice or believing he may be. So I cannot and should not trust anyone. I should always check for risks, for failures, counterchecks. Otherwise I would be fired very soon. Because during a year 10 or 20 times serious issues rise. And you have to deal with them. So you have to manage expectations in the organization. However important ICT is for the organization, it is still risky business. So you have to deal with it that way. So I have all sorts of management systems, top 10 critical management systems of the organization so I can check again. To review systems, do risk analysis. I have a security team and I am always in touch with them and they have to inform me immediately about risks because I know they can rise. I have to perform penetration tests on a regular basis. There are a lot of threats. People just for fun try to exploit our weaknesses. And I cannot invest millions in security and perfection. We have lots of systems. For
the clever and persistent hacker these systems can be proven risky and I have to accept and deal with
that. In this process I am quite irrational. I listen to my gut. I jump to conclusions very soon. As a CIO
you don’t have the luxury of getting a signal, then thinking about it, discussing about it, do analysis
about it and then act. This takes too long. If you have a signal, a feeling, then you have to act
immediately. Sometimes it is a false alarm. I train my people in not ignoring signals, not being afraid of
false alarms. It’s a risky business and you have to act fast. There I am in a way irrational. I have to
detect early signals and if things don’t count up right or if I have a feeling that a system is too
complicated, if I don’t understand it, then I act. That’s what I mean by as a CIO you have to be a
suspicious irrational person and have to act fast to survive. As a professional it is necessary this way.
And I have to train my whole ICT organization in that respect. It is specific for ICT also, because it is
immature. Very fast developing. Possibly this approach is valid for other parts of society. When I
watch other domains I also see that it is important to use irrational factors in decision making. The
whole world is not logical and we do not have a complete understanding of things. In important areas
of scientific research major breakthroughs have taken place by irrational steps.

What do you think is the source of this way of thinking? Is it experience?
I think experience certainly matters, but I think an open mind is as important. Also it is important to be
very curious, open minded and curious. A good leader should have three qualities: he should support
the good in an organization, he should stop the bad – a lot of people don’t do that – and he should have
an open mind, he should be curious. These I think are the main aspects of a good CIO and maybe of a
good leader. Supporting the good is very important because there is always a lot of good in an
organization and he should actively support it, people, ideas. Stopping the bad is also very important
because often bad projects are not stopped and it takes courage to stop things. The third and maybe
most important is to have an open mind, to be innovative, outward oriented, to listen and understand
signals. He should not necessarily have a lot of experience. Experience can also sometimes make you
less curious. It’s not just experience. It is also maybe wisdom. To understand that it is important to
listen. Experience can also be bad. I don’t look at the world as experienced and not experienced, young
and old. Old people can be very open minded and young people can be narrow minded.

Is only time a factor with these approaches – being curious?
I think it is applicable also when you have more time. In a way it is a general issue. Recently, I heard
about ICT projects in Kenya, where they don’t have the money to organize large projects. So they have
no option other than to adopt scram methods. Because they have money only for the first month. So
they have to do a scram method. The end of the project is in a month and then they will see if they have
money and can organize a follow up. That is an advantage in a way, because sometimes we have the
money for three years and we make long-term projects. We think we can plan three years and in a lot of
ways it’s an illusion. Even if there’s no time and money pressure, you have to organize it, to develop
by acting. To learn by acting. It is a complicated process, thinking, acting, learning… It is maybe the
most important of learning and developing. It is useful to introduce in decision-making processes, even
if there is no time limit, to introduce a time limit, a money limit, all sorts of limits, and then maybe
make a small step, a small decision. And to be flexible in your next step and next decision. That maybe
does not apply in all areas and sometimes you have to develop a long-term perspective, a choice for a
long period of time. But even then you should be flexible and accept that you cannot oversee all of it. Even then you have to follow your instincts, which are certainly also a result of scientific wisdom or collective consciousness, intelligence as a person, organization or society. But even then it is always good to be cautious and suspicious about high-level society. I think the crisis of the last 10 years told us certainly that maybe we have followed the wrong directions in a lot of ways. The rational idea of decision-making, being fully in control, that’s only a part of society and reality.

Do you make these decisions – choosing for an information system – as a team or individually?

Very much as a team. That’s what I try to do. I have a small team of 15 most prominent advisors, but also among the rest of the employees I listen to anyone who is an expert on a subject. It is very important to create an open atmosphere where people are willing to tell what they think, to share, where it’s ok to say something completely wrong or to make mistakes, also in discussion. It is important to act as a team and to gather in that way collective intelligence, to get more signals. In the end of course you have to conclude, to act. But the team effort is very important, at least for me and it is for successful organizations. Of course the funny thing is that sometimes the team advices one direction and you choose another. But even then it is a result of team thinking. Because it sharpens your decision if you go left and your team advices for certain reasons to go right. It adds quality to the decision. I consider the team as a very important aspect of decision-making. Especially the diversity in a team, cultural, men and women, age, education, social background. Even in ICT decision that seem to be technical but are not.

Do you think that acting intuitively is considered a legitimate way?

I think it increasingly is. Sometimes even in important matters I say it is professional judgment or something like that, which is also irrational decision-making. Of course I don’t present my major investments as a result of irrational thinking. That would not be clever. So I have to be quite political in presenting conclusions or investment options. In the context of this organization it is ok to present investments and decisions as a result of collective decision making, professional judgment. IT economics is not so important here as in other organizations. In business cases it is acceptable to present qualitative aspects, not just quantitative. During my Master studies one of my colleagues was from [company y] and a lot of ICT decisions were based on IT economics. Investments and nearly all decisions were based on ROI etc. The funny thing is that he said that the main decisions in IT in [company y] are not taken by those investment boards but by the top board who say “to stay in business we have to do this and that, the next step is all sorts of small projects”. But the main decisions are in a way irrational, gut feeling, collective wisdom of a team. So even in a seemingly very rational approach the basic underlying choices were made on a different basis.

Does this count only for IT? Are other decisions different in an organization?

I think it’s not just IT. I think IT is interesting because it involves a lot of money, it involves innovative investment decision making, which in other areas are much more stable. It’s a domain in society where a lot of decisions take place on a daily basis and it’s very new technology. But it is also in other areas, infrastructure etc. In you analyze the decisions about investments in the Fyra I think you will find the same aspects of seemingly rational but in fact irrational decision-making. It can also be the wrong decision-making of course.
What are the steps that you go through when you realize that you want a new information system, or need to make a change in an information system? How do you come to the realization?
That can arise in all sorts of ways. Sometimes new processes ask for new IT, new tasks, sometimes existing processes can be dealt with a more efficient way. Analysis of processes that can be leaner and can put IT in to make it more efficient. And sometimes you have present ICT systems that are performing bad, very expensive and are subject to renewal. In all these cases innovation and investments can arise. It is important to consider new processes from the beginning and introduce IT, processes where you don’t use much IT are in constant review about what you can do better by introducing ICT and you have already ICT in a lot of processes and you can improve it. There is new technology, new possibilities, maybe cheaper. Variety of analysis and signals can arise in these areas to introduce decision-making on this part.

Is it easy to gather all the information that is needed to come to a decision?
It is very difficult. A large part of the job is to put relevant information and signals in place, gather it. All this information is very hard to collect. Business intelligence is very important. So to start and to develop ICT systems you have to establish a good idea of what we are talking about. That also applies to other areas. Existing information systems. How they perform, how they are connected. It is often difficult to get a good idea about that and it is very important. And there is always the risk of building something new without carefully taking into consideration what is already there. Sometimes there is something very good and functions very well etc. It is important to have a good perspective of the landscape, of the people. Maybe the most important aspect of the work of an ICT manager is to be in touch with reality of the organization, with the people.

In the end what would be your advice towards a manager who is in this position?
I think be in touch with the people you are working for, with reality, what are the problems that should be solved, business problems, be in touch with technology. Make sure that you are aware of what is good and what is not so good about this technology, be in touch with your colleagues and people around you. Don’t isolate yourself with specific vendors, a few advisores, or with your boss. Be in touch and finally be in touch with yourself, your feelings, your personality. Then maybe you fail in your decision but not in yourself. That’s more of a philosophical advice. Better making wrong decisions and be happy than making good decision and not be happy.

Interview 4

(Manager, Private sector)

Can you describe what you currently do, what is your connection with information systems?
I’m the CTO of what we call information management and analytics. In the organization we have different products and services. And we have a couple of big themes: security, cloud, mobility and information management. So everything with information, big data, that’s what I’m doing. So I’m pulling together all different things, different business unit to make general propositions to the outside world. The face towards the outside world about information management and analytics. And we have a department of sales people, services people working on that. Sometimes I also engage with customers
to do consulting at the very beginning. So I try to formulate the message that comes down the pipe, from our engineering department etc. towards customer propositions and inform them: this is the technology, this is what you can do with it, these are your problems and this is how we can solve them. So I see a lot of organizations.

*Have you ever been in a position to choose for an information system yourself?*

It’s good to set the right perspective, cause I’m not a customer, I serve customers. So I always try to tip in in their decision-making. I’m an advisor. I sell software and services and then the services part is actually engaging with customers to help them understand the problem and there are certain approaches for that. In the beginning, people are biased in these very first meeting, what is around in the market, the buzz etc.

*Can you describe the process that your clients follow when they want to implement something new?*

We have a lot of customers in the Netherlands, and we have differentiation between say the top hundred customers, the biggest organizations, like banks, the government, and there is mid market and a small market. The top market, the governmental organizations, big banks and industries, we call them accounts and every account has a dedicated account manager, an executive. He oversees the relationships in the account, he knows the customer, what is going on there. We have different product lines on hardware, software and services and they all have sales people so they also go to that account. So I’m running as an expert in information management and analytics. What we try to do with this customer is understand their business, problems, play it back to them and play our portfolio to them. So the engagement with customers is really about understanding their problems and trying to tap in their needs.

*Do they come to you with a clear view of what they want?*

Especially government organizations are a little bit special, because there’s a lot of politics involved. There’s a cultural difference. So I notice that there’s a big gap between the art of the possible and what they think they need. So there’s always the art of creating an understanding with the customer, “you may think that that this is your problem, but we think that is your real problem”. To give you an example, especially in the government, there are very formalized routes to eventually buy from vendors, because there is the European tender law, to give everybody equal opportunities to sell their stuff. So the government starts towards the market, always with a kind of orientation. So they scan the market and say suppose we want to do something with big data, they want to get acquainted, they want to orient themselves with big data. I was with one organization, a couple of weeks ago and they wanted to know what is big data, what’s in it for us, what do we need to do, what do we need to know? That’s the first step and you give them presentations “this is how we see big data, related to your organization”, so from that moment on you already are influencing their shape of mind. You try to create some sort of mindset. When they are finished with their orientation, they go into their formal phase. The first step is called a ‘request for information’, which is like “we think of doing this kind of project, do you have products and service that are capable of doing these kinds of projects? Are you a well established company, do you have any debts? Etc.” there’s a sort of pre-selection. So from a hundred companies that write in, only ten are selected and are allowed to go to the next phase, which is
the ‘request for proposal’, which is a kind of bidding phase. They narrow down the question, and then you write a big proposal, a big report about how you can help. At a certain point it becomes rational. I now realize that government is actually a special thing, with this whole European tender law. In the request for proposal they have selection criteria and they always have the rule of the best economical value, which is an ambiguous statement, because you can have multiple interpretations about it. Company A is offering this solution for 1 million and company B is offering a solution for 1.2 million, why are they cheaper? Do they offer the best solution? Maybe company B is the best solution, in the end. But there is a kind of subjectivity in there. They give points, you write your story, they interpret it… do they interpret it in the right way? Are you using the right language? I’ve worked with the European commission, and they have special language, very difficult. There was a very small company trained in writing proposals towards the European commission to really tap into their language. The use of words, the use of statements. So, in writing this proposal you want to be sure that they are reading the right thing. This is another non-formal aspect.

Do you think that the same thing happens in the private sector?
It is less. The private sector of course they orientate themselves. But they are not obliged to do this equal treating. If they say we like a company, they ask for an offer. And don’t need to ask other people, they can go to this company and ask for an offer. And of course you can have a proposal, and there’s negotiation.

When they have past experience with your products, are they more inclined to go to you again?
Yes. Probably what’s you are tapping into is this whole concept of IT governance, which is about governing actors. They have this learning curve, this IT governance field, you help them build things. If it is a very good project, of course there is a bias. And that also taps into the relation that a CIO or a CTO has in the organization. A lot of times there’s a big gap between business and IT. The IT people very often have difficulties to prove themselves to the business, that they are valuable. There’s a lot of politics involved here. And if you are able as an individual or as a company to help the CIO get into a better place, to do good job, to be trusted, that is a sort of personal benefit for him. So it definitely helps if in this pre-face, where you talk with customers, because in the official tender, the door closes and they are not allowed to talk with you cause it must be equal and fair trade. In this pre-face, if you say this is what we can do, this will put you in a better place, in a better position, we can help you solve your problems.

From you experience, do your customers make decisions in teams or it falls on the CIO individually?
This is what we call DMU, the decision-making unit. You have to realize that in organizations there is a lot of stakeholders, everybody is looking at a solution or a project from a different angle. In judging such a proposal there is always a lot of people involved. There are the business people, who you make the project for, technical people, financial people, the buyers who are managing the contracts with the outside world, they always try to get discounts, create shortlists. And they have to come to a consensus at some point. And as a commercial company you always try to identify the individuals in the DMU and their story and try to understand them. You try to have sort of personal engagement, build a first level of trust. “Believe me, I’ve done it before, I’ve seen it before.” It’s all about ‘this is how I’ve done
it’. But a lot of the times problems are unique. So you have to refer to ways you’ve done it before in a little different manner. We’ve done this for this piece of your problem, for this piece we’ve done something else. A problem is not always the same. And they always ask for references. List 5 projects minimum where you have done… So, previous experiences, success stories, they really count in the decision-making. But also the personal element, the people you like… if there’s a mismatch, forget about it.

*When there’s a unique problem, how do they assess the state of the organization and the effect the new technology it is going to have? The implementation of new technology is probably big change. How do they manage it?*

That is a very good question, because that is something that a lot of the times people do not take in their decision-making. Because they are very technology focused. My experience after 30 years of IT is that it is the cultural thing, the organizational thing, the process thing that actually counts.

*And you don’t see it being taken into consideration?*

Not much. So what we always do is… for a vendor this is a difficult point, if you offer a solution “this is what we can do for you, this is the technology and how it works, but you have to adjust your way of working.” There’s management of change needed. So we always have a phase in the project where we verify that. They ask us for criteria and requirements, and specifications, and we bring them a proposal where we have assumptions. “We assume this and that… how are you going to manage the change?” And there’s always a starting point in projects where we come into a collaborative engagement “This is what we understood from you, this is what you understood from us how can we move further? Because we don’t want to connect with failure.

*So you help them with this process, the change?*

Yes. But that is not our core business. We had a project with an organization, the members had to work in a different way. They had a paper system actually. So the people had to work with a computer. That was a big change. And then we started working with them and they had all the processes analyzed. So we said, “if this is the truth we can create a screen like this” “No, that’s not good.” “But according to your processes, this is how we can do a screen” “That doesn’t feel good. Let the users have a look, play with it.” You can write everything down, you can decompose your processes, make schematics etc. the moment you start working with it things change. And they do not realize that.

*And isn’t it possible that while you are working on the project something else has already changed in the organization?*

Yes, it happens and it is difficult. At the beginning I was saying that understanding the problem together, to create a shared understanding is a very major thing in this whole customer engagement. But their decision making is vary much dependent on rationales like how much does it cost. How much can we earn in this. Making big investments up from is very difficult. So they always try to figure out what is the payback time. How soon can they get their money back.

*Is it usual for the managers to make decisions based on a feeling?*
It depends. That’s why this DMU is always made of different people. There are people like the buyers, the management people, the always look at the figures, they try to get discounts, there are financial specialists, but the senior managers they have a sort of hunch “He is a good guy, I trust him, he can help me.”

*Is this a legitimate approach?*

No, it is not legitimate for the governmental organizations. That’s why I say that there’s a phase in this whole engagement lifecycle where you can influence them, mind share. But there’s a point in time when they say now the door is closed and are in official tender territory. You cannot reach them, there’s nothing you can do. So you must do everything in the beginning. And even if you have done your job here and they believe you and you have good relations with them, if put a proposition that doesn’t fit you don’t get it. So the balance is more or less equal. They can always say, “take this company. I have good experience, I trust this guy, they make a lot of sense” there’s always rationality in there. Because they cannot – and this for government specifically – say to the public if something fails, we chose them. They have to say we followed the rules, it was a good proposal and we chose them.

*What about in the private sector?*

It’s more liberal there. But again, if you are in the stock market, you have your shareholders. And they can say you started this project with the wrong company.

*If someone has a feeling, a hunch, is it this that’s is stopping them? The responsibility towards the shareholders or the public?*

What you often see is that if someone has a hunch and it is something they like, they try to rationalize it. They try to do a little investment and develop a proof of concept. That is very often in the private sector. So if you can do a proof of concept, build a small environment. So that is what very often they say, “I like what you are talking about, makes sense, let’s do a proof of concept. Is it really true what you are saying? You have a hunch that this will go well… prove it”. So they give you all the space to develop something.

*In the end what would your advice be towards managers who want to choose for an information system?*

I have seen requests for proposals where they have 500 requirements. They are sort of framed by their own ideas. They just do not know what to ask for, because they have their own view on the problem. So, instead of answering 500 requirements, tell me what your problem is. Instead of horribly specifying some sort of monster… even if you specify 10,000 requirements you’re still not going to get what you’re expecting. There’s been a lot of research on requirements specification. There is not a single research that says this is enough. For years people have been researching and writing about it, there is no solution. So instead of trying to specify the solution, let the vendor look at your problem. And try to define the problem together, create a shared understanding about the problem together. I was with a bank last week, they invited a couple of vendors for the whole afternoon and said we want to innovate the bank. And they shared their problems, this is critical for us, this is how we see the future, what do
you think of it? What’s your understanding? Do we have the right things in mind? If there is innovation, you can divide it into two big categories. There’s the very formal part, how much does it cost, is there a payback time, is it really feasible? But there’s also a sort of creative part, the idea, the concept. My advice to senior managers is to emphasize, spend more time on the idea and involve the market there. IT decisions should be based on more inputs, a more holistic view. That’s what my advice is. Because you must have a better understanding of what your own problem is, get a shared understanding, maybe the market has seen these problems as well. For example, if you are an oil refinery, there are other oil refineries in the world. If you are a tax department from the government, there are more tax departments in the world. How did they solve their problems? So, ask vendors for visits, learning, learning with each other.

*Do you think that decisions regarding IT are different from other kinds of decisions in an organization?*

Yes, I think so. IT is tech. And the last 20 years technology is… we don’t have a very good name. The business say tech always costs money and I’ve never seen it decreasing, it is always rising. So they are very cautious. There’s this IT department, they are coming now with another proposal to improve my business, I know how to improve my business. That’s the culture, the political tensions. So IT decisions are different. Definitely.

**Interview 5**

(Interim manager, Private sector)

*Could you tell me a bit about what you do and your connection with IT?*

To begin with I’m an interim manager, which means that I’m self employed and people can hire me if they have an IT job. So I do different jobs in IT about management. So sometimes I just run a department, I do a lot of change management. At the moment I’m managing big change in IT. These two organizations had a joint venture, but they were two totally separate firms. They have their own IT departments, their own data centers, security guidelines, Internet connection, and web servers. But because the two firms merged it is very expensive to keep two infrastructure environments up and running and my job is to put these two infrastructures together. So, I’m a program manager for IT, but in that program there are more project leaders, more projects, that are concerned with data center consolidation, network consolidation, security consolidation, telephony consolidation, etc.

*Have you ever been in a position to choose for an information system yourself or lead a group to make such a decision?*

No. Usually there are already information systems in place, but what we do is if we have an information system at one company and an information system at the other company that have the same functions, we have to choose one of them to remain. And sometimes it is possible if both of the systems are very old to we buy a new information system. That also happens.

*But eventually you do make decisions about choosing or implementing new technology.*
It’s not that I can decide myself. I have an executive whom I report to and the executive has a program board. And the program board they have the money and say that’s your budget. So if I need more money or go above my budget, the program board is the one that makes the final decision. And in the program board you find the ICT director, who is ultimately responsible.

*From your experience, when managers have to make a decision about an information system what is the process that they follow?*

This is a little difficult for me to answer, because I’m from infrastructure, not from the IT systems, so I don’t know how that process really goes, but if someone wants a new infrastructure system, a new network, or a new data center, the process we have is: plan, build and run. In the “plan” environment there are the architects. That is always in the planning phase. For example they find new systems that are better than the current systems in the organization or find ways so that the organization can save a lot of money changing the old infrastructure into the new infrastructure. They do the plan for that. And they can put the plan in a portfolio environment, and this is the direction of ICT and they can make decisions about the things they do and the things they don’t. They also have the budget and see which plan will move on and which won’t.

*Do you think that the main concern is saving money?*

Yes. My concern is to save a lot of the cost, but it’s also the start for other changes in the organization and hopefully in the end we will save a lot more every year. So, it’s a big saving program.

*In the planning process, do the architects have all the information that is necessary for the decision?*

The architects are more technical influenced. They also consider financial aspects. How much do the new fabrics cost… that’s on a high level global scale. We need some financial experts to see if it’s worth doing.

*In your experience, these decisions are made individually or in teams?*

It’s difficult to say. Sometimes it is in teams, sometimes individually.

*Have you seen teams collaborate efficiently and produce good results?*

Yes, also in my organization. A lot of problems or ideas that they have in the beginning and require things to change, if they are not communicated to the people that will be running the environment later on or that will build the environment there is friction. So if I want to be successful with my program it is my job to put all these teams in one place and let them talk to each other.

*Does this work?*

Yes, it works. There’s always a lot of friction, but I think that it is good to see the new environment from different perspectives. It is difficult if you consider only the perspective of the planning phase.

*What information do the other phases provide?*

The provide information regarding the effects on the organization. If you have some ideas then you talk with the people at the “run” they worry about aspects like “What is my job going to be now? Do I keep
my job? How is my job going to change? Is it better for me, for my department, for the organization?”
Really different perspectives.

What factors do they consider in order to assess the state of the organization?
This depends a lot on the individual. But you can say that it is their own job that everyone is primarily focusing on. That is also what is very difficult in my program. If you reduce your infrastructure, you also lose people in the organization. There’s not enough work for everybody. And it’s a very difficult process that the same people you need to help you to reduce the infrastructure may lose their jobs in the end. That is difficult to manage.
Do you think that this kind of decisions can be made intuitively? Or do managers always follow a structured plan in order to reach a decision in the end?
It is a mix. You have a formal process, you make a plan, you go to portfolio management, from portfolio management you go to ICT direction and they make a choice. That’s a nice process. But sometimes there’s not enough time to follow this process, sometimes you have to change it all and make a decision in three months. Then there’s no time and the decision has to be much faster. You can see this happening. That’s the mix that you see in every company. There are nice processes but sometimes everything has to be faster. And even someone from the board of directors can say that he wants one specific system on a specific level of the organization and then it will happen. That’s real life.

Is there a phase in this process in which intuition is more inherent, where it is used more often?
Not every decision is fully rational. There’s always feeling and intuition.

Where do you think this feeling comes from?
Sometimes it is experience. I mean if you work for 20 years, you’ve seen that some changes did not work and probably the next time it also won’t work. That’s what it is based on. Of course sometimes, after 10 years, with completely new technology, you cannot compare with changes that happened in the past.

What do you do in that case?
You always try to make decisions as rational as possible. Of course it does not work always.

But is experience important in order to make such as decision?
Yes, absolutely.

Do you think that making decisions about ICT is different from other kinds of decisions in an organization?
That is a little difficult for me to answer because I’ve been making decisions only about ICT for the past 25 years.

When someone makes a decision in a rather non-formal way, is it considered legitimate?
Sometimes decisions are irrational and sometimes an executive may say that this is a decision that is not advanced for my program or project, definitely it is not good for my deliverables, so if you keep your decision, it is your decision. But then I’m not your program manager any more because I can’t strive my goals any more. So in a sense you have to make a big coalition in order to change.

_Do you think that people who have the intention to make a decision in a non-formal sort of way encounter obstacles?_
An example of my executive not making non-formal decisions was because his environment pushed him. And in my opinion we made the wrong decision. Then I advised him to reconsider it and he did. Very non-formal decisions will always die in the end, they won’t really happen. The wrong decision can cost a lot of money for an organization.

_In the planning phase how do managers assess the state of the organization? Who do they listen to? Who do they trust?_
It depends on the organization, but mostly they listen to their consultants.

_Why do you think that is?_
One of the reasons I guess is that if they fail they can put the blame on the external consultant or the external company. If the people around the manager help him to make a decision, it is the same people that he chose to work in his company. This is maybe one of the factors.

_Do consultants have a more objective view than the people working in the organization?_
The people inside the organization know best how things run and how processes work. But they only have a view of this one organization, while the consultants have a view of 5, 10 or 50 companies. And the best thing is to bring the internal and external people together so they can have a discussion and then make a decision. That’s the best way. This happens here also, it’s what we do. In my program I do it as well. If I have some problems getting these people together towards the same direction, then I would get someone external and I would say can you help me with this discussion? You have the experiments of other organizations, they have all the experience of the same organization form different perspectives and that’s the way to make a good decision.

_If we do back to the people who make decision following their feeling, what are the problems they face in this process?_
At infrastructure level, it can be that some people have the perspective that it always has to be the same supplier. And they always go for the same supplier. However, other supplier may have much better solutions and they have problems to let the primary supplier loose. This is a possibility.

_In the end what would be your advice to a manager in the process of making such a decision?_
You have some innovation going on. You can do that in different ways. And then bring some new ideas in a portfolio. How much the money is and what you need. And what is also important is the business requirements, the needs. That’s the normal process. But then what I think is always bring those people together. That is the best way to make decisions.
When all these people talk together what is it that they accomplish? They look at the problem from different perspectives. Someone might have the perspective “we’ve already worked 10 years like this. So it is the best practice to keep on doing what we had in the past.” Someone else might say, “this is very innovative, we must have new things, we have to try, we have to dare” or “look at the best practice, look what the other companies are doing, we should do the same”. And these are all different ways to look at a choice that has to be made about infrastructure. That’s the best you can do. Bring them together. Listen to pluses and minuses, here them all out and then go for a solution, which everyone can find themselves in.

Interview 6

(Consultant, Public sector)

Can you tell me a bit about what you do in your job now?
I’m an IT architect. I translate business issues to IT and vice versa. My background is in economics and I’ve been working in IT for twenty years. I analyze IT and business situations, in terms of consequences, what will happen if we choose this or that.

Have you ever been in a position to choose for an information system?
I don’t make decisions. I only give advice. But I see people make decisions. And sometimes they choose what I advise against and then I have to talk to them again. I analyze the impact it will have but they go for it anyway. They still never say I was wrong.

When they choose wrong, why do they do it? Is it their instincts?
Most of the time it is a political decision. “If I choose that they might be angry” and I only work for government and that’s a big issue there. How much it costs doesn’t really matter.

Do you think that politics are important only in the public or in the private sector as well?
In the public sector for sure. But I also think in the private sector. Because sometimes I talk to people that work in banks and it is the same. Big companies have the same issues. I’ve never worked in a bank so I don’t know exactly but from what I hear, it is exactly the same.

Do you ever go with instincts in the decisions you make?
Because I have to write an advice, if I think something is not good, I don’t bother make an advice. I talk about the things I think might work. I don’t argue about the things I don’t advise for. And if they ask me about it I say that I’ve seen it before and it does now work. They usually trust me.

Does this come with experience? Can someone rather inexperienced make these kinds of decisions?
Nowadays everyone calls himself an architect but people just out of school don’t make the right decisions, not because their knowledge is not good, but because knowledge is theory and not practice. It does not fit. And you can choose theoretically the best solution, but it doesn’t work.
Is theoretical the most formal decision?
Not only. Sometimes they know the theory but they don’t know how theory works. In economics they think that what they books say is always right, but it’s not true. Different people make different assumptions about how things should be and how they work.

Is the difference between theory and practice because of the human factor?
Most of the theories are made by people who have a lot of practical experience. So they write it down. But people who don’t have that experience can’t take it as a recipe. It does not work. Because people don’t know all the alternatives, the different options. I think that’s one of the reasons.

When a manager wants to choose for a new information system in an organization, what do they take into consideration in order to assess the state of the organization?
My first question is always, why do you want to change? Because it’s new, of better quality, or it is faster, whatever. And then I try to understand what they mean by that. And if you ask them over and over the real problem reveals itself. And if you do this process very fast, it might go wrong because you don’t really know what this problem is. What people say doesn’t always reflect what the problem is exactly. And sometimes it is about “I will have more people below me so I will have a higher salary.” That can be a motivation.

Is it easy to identify this problem?
No, it’s not easy. It has to do with what people find important. Because what they say is not really what is the case. If I do a presentation for 10 managers no one will say I don’t get the point. Because the others will think they are stupid. They don’t really understand how they miss the point. If you ask in the group if they understand it’s no good, but if you ask them alone, they are more open.

What else do they take into consideration?
They sometimes make the decisions that are better for themselves. They make excuses for why or why not. You try to understand why and try to find things they can relate to. But completely irrational decisions do not work. People in IT themselves are rational, so it is yes or no, there’s no in between. If you talk to business people, it is never yes or no.

Do the IT people make decisions on their own or in teams?
It depends on what level. The IT people make a lot of assumptions without specifying them.

In the end is it one person who makes the final decision?
In the government it is usually a team. So no one has to shoulder the blame completely. And it might not always be the best solution because it is the group that says yes, they are not thinking rationally. Everyone has to be pleased. It is very complicated. The best solution is not always the same for all organizations.

It depends on the organization you mean?
Yes, also. In people’s reactions and interactions between them. They make all kinds of assumptions. There’s miscommunication. There’s a difference between data, information and knowledge. If I say 20,
it doesn’t mean anything. It gets meaning when I say degrees. But the question was if it was a warm day. 20 degrees in the Netherlands is warm but in the desert it is cold. There’s a difference. I need context to come to a conclusion. In decisions related with IT it’s the same. For example, I want a good system for human resources. Why do you need a system? What is a good system? They have to define the need first. And part of intuition I think is, I know what to ask you. I know what your problems are, I don’t need to ask you maybe. I can easily make the translation if you ask me something. It is easy to explain this to people. The last level is knowledge and it is about your perspective of the world.

Are decisions about IT different from other kinds of decisions?
I don’t think so. I think they follow the same process. And it depends on the individual but I think that when they have a problem, they use IT and then the problem is solved. If you don’t tackle the problem itself, there’s no real solution. First you have to think about what is my problem, and when you know the problem you can choose a system.

Basically you think of IT as an instrument?
Yes. Sometimes as an enabler, but then you must understand that if it is an enabler you have to use it as such.

If someone makes a decision based on a feeling, is it legitimate?
It depends. I was at an organization and there it was very common. If someone says it’s no good, then it probably is no good. Because people know each other for a long time. They trust each other. When I was internal in that organization, what I said was not heard. After a year I was external and I said the same and it was suddenly true. Because someone who doesn’t work there has a better view.

Why do they follow the opinion of an outsider?
I don’t know why. It happens in other large companies as well.

Are there people who object to this kind of behavior?
People sometimes don’t have a clue what they are talking about. Managers consider only a part of the world, they don’t see the whole. They focus on numbers, and because they don’t have a clue of the whole, they obsess about these numbers. It’s about the whole picture and they don’t have it. Most project managers think only about the budget. Not about the quality of the product. They sometimes make decisions based on the price. If you pay in peanuts you get monkeys... It happens. Because people who decide about hiring are the procurement people. They don’t think of quality.

Is this mentality of basing the decisions on the price characteristic of the public sector?
I think it is general. And in a large company there is a lot of people that you have to talk to in order to understand what exactly is needed. Everyone has their own interpretation. This is what you see in IT systems. They want a system, they don’t specify the requirements, it takes a while to build it, the organization will change in the meanwhile, so there is a chance that the deliverable will be too late and will never be used because it does not fit the needs.
Is there a way to tackle this problem?
As an architect I try to bridge this gap. Project managers usually don’t talk to the outside world. They don’t want disruptions. They build a wall around them after they hear what the client wants. Then they isolate themselves and just build something. As an architect I try to look above the wall in these two sides and get them to talk. Sometimes it works and sometimes it does not. And of course money plays a role in what will be built.

Do you do this process during the development?
Yes. It is a long process. And sometimes there are new developers who don’t know what you want, or they think that they understand what’s on the paper, and of course half of what is the case is on the paper. The smaller the company the less risk you have. If it’s one person you have to talk to it is easy to understand each other. But with big companies it is very difficult. And if the company changes, the system has to change as well, but they don’t see it because the level of complexity is very high. That’s why I make models. The change and the dependencies are more recognizable.

In a bigger organization, how do they manage the change?
There are two things they use, governance and most of the time they follow certain procedures. A change plan. They answer questions like what is the change, why is the change, how much does it cost, the impact. There is whole procedure for that.

Does this have results?
It is a change procedure. If you want change you must follow it. It takes time. In the public sector it is more or less stable. Only the law changes every four years or so. It also depends on the company. If you are a telephony company, you have to change very fast. In the public sector they don’t want to take big risks. They try to make it perfect and in the end it turns out way more expensive. And at higher-level management they don’t want to be very detailed in what they say so they won’t have the responsibility for when something goes wrong. I try to make it very concrete. They are more general, they talk about quality, speed. But these notions are vague, subjective. They need to have a clear idea about what their vision is, what it means exactly and what is the impact of this vision. And everybody in the organization needs to feel the same way. If they have their principles clear, they can refer to them when they want to make a decision for a new project. They decide to do things because of political reasons, regardless of the effect, the money it will cost and whether it fits in the architecture or not. But they should at least be aware of what they say yes to and what are the consequences. There are some boundaries within which they can act. At high level they are very wide, at low level they become more and more strict.

What would be your advice to someone who wants to choose for an information system?
First, think before you act. And by thinking I mean make it concrete. Make sure that everybody understands the same thing and is on the same page. It is difficult but in the end it will save a lot of time and trouble. Most organizations don’t want to invest up front, because they cannot see the result yet. So it’s good to just start with something. Make some progress.
Why does it take a lot of time to understand each other?
Because people have to become aware of that fact. They assume that everybody thinks the same.

Is this why organizations need external people to help in this process?
Maybe. Sometimes it takes someone outside of the problem to realize it. What people are really talking about and whether they have the same perspective or not. And the more complex the idea the more risk there is that you are talking about different things, without knowing it. Sometimes I sit between business and IT and try to facilitate their communication, make sure that they understand each other. And the more experience you have, the easier it is to find the right questions to ask in order to achieve that. It’s like driving a car. After some years you are not conscious of it, but you are doing the job. I think it is like when someone has a lot of experience. His consciousness will take over. But at the beginning it is very conscious about the decisions.

Does this mean that someone with a lot of experience will make the same choice if it has proven successful in the past?
Yes. And I think it is experience that makes someone think that something doesn’t feel right.

Interview 7

(Interim manager, Public sector)

Could you tell me a bit about what you are doing now professionally?
What I’m doing is leading projects for innovation and the background of most of the projects is to give better results with less money. IT is one of the instruments that we use. I work most of the time to support policy making, facility management, personal affairs and IT. And what is a pity is that the things that people used to do in their work, now will be done by computers. So, I work to set up systems of self service by computing. And we can follow what people like, what they don’t like, how we perform – that kind of systems I’m working with. I lead such projects.

Have you ever been in a position to choose for an information system?
Yes. I usually do a job and then I go away. I set up a systems and then I leave. But its not only to set up the IT instruments. There’s also the need of a cultural change – the minds of the people, how to work. They have to work from the perspective of the client, not only about how they can do their job best. Most of the people can ask for the services they want by computer. So what I do: I set it up and I try to do is change the mind of the people – that they have to work, perform and deal with their clients in another way. And when it’s working, I leave. I have some experience with implementation. And it’s a tough process because most of the people don’t like the concept of self service. And clients usually are familiar with most of the people who originally worked in service or facility management, and they find it hard to accept, to integrate with the new systems.

What I’m particularly interested in is the process of making a decision for an information system. You have seen managers make these kind of decisions or you have made them yourself. Could you describe this process?
I work in the public sector. The original thought is that the service of the employees and the policy makers is very expensive in comparison to the market – the private sector. So the government decided to cut the budget for the support. The underlying idea was that with the help of IT systems you can reduce the budget. And another aspect is that you can follow the movements – the things that people ask for, you can watch how much time it takes for a task to be completed. So with IT systems, we can get more information about the way of working, the performance of the government in relation to the market. Another thing is that we now have more insight in the way we perform – what is going good and what is going wrong. So in fact it was not a process that was chosen by the different departments. It was a top-down decision. “We have to do this” and then the work starts in each of the departments.

The decision about the specific information systems that will be used in each department is top-down as well?
No, the process starts differently. The government decides that a department has to reduce its support budget, for example by 6%. And they describe how the departments have to do this. And with the use of IT, it is not necessary that every department has its own support organization. We make one support organization for the whole government – a shared service organization. And there are two or three people that look around in each department to see what is necessary, what they demand of the organization which does the job. The decision to go there in the department differs, because for example there are departments that originally work a lot with computers and employees are used to this way of working, they don’t ask a lot of questions regarding what they can do with the computers. In these cases it is easier to outsource the support organization. At first this decision is made and then somebody has to fix this job. And this person is most of the times someone outside of the organization. This person, in order to do the job, has to deal with the clients and with the employees who have been working in the same way, in the same organization for years maybe 20 or 30. So the government say “You have to do it, You’ll make a plan, with a vision, with the steps that have to be followed.” But most of the time you don’t have enough insight to plan all the steps, so you have to do some research first. When you do the research, then you have the analysis and based on the analysis you can write a proposal on how you can outsource it, in what way, under which conditions and what does it mean to the employees. When you make that plan the top of the department approve or disapprove of some aspects or ask for some changes. And this is a difficult situation, because in the facility management, in the support of employees the language is totally different from he policy making language. Another aspect is that the decision makers can describe what the government wants but they – the decision makers of the department – have a lot of personal support around them. So its always difficult because they say “Yes, but not for us” and that’s inconsistent. That’s always a difficult moment to get enough pressure and support to start the plan. And after they have made the decision then you have to deal with the unions of the department, who watch the right of the employees. So, there are different steps dependent on the moment of the process in which you are. And its always good to stay in speaking terms with the unions. Because they can give good advice about the changes that are being made, and some changes may be good but others may have negative aspects for the employees. Employees have rights that differ between the departments so there are lots of aspects that play a role in the whole process.
This research that you do in the departments what aspects does it cover?
We first look at the processes of working. In my last job there was a very complicated working process. The background of the process was not “how can I serve my client in the best way”, but “how can I best manage my processes”. They don’t think from the perspective of the client but from their own. So it takes a lot of effort to change their way of thinking. Because for people who have been working for 20 or 30 years in the same way, its nearly impossible.

Have you witnessed changes in such people’s minds?
I see changes, but they only stay when the director and the head of the department are very consistent in their behavior. When they are strict about the way they want their employees to perform. There is not enough backing up from most of the leaders and the way they engage with the new processes. Most of them don’t take enough time to speak with people and try to change their minds. Changes are hard. They do some aspects of the new approach, but other aspects say the same. And that’s the dilemma. The goal is to do better with less money and a lot of the money is in the people themselves. For young and well educated people it is easier to change their minds. They also like computers, they think with computers. So in fact you need some new people to be role models for the older ones and support them. And what you see is that the decisions depend on the direction and the support by the top, to the work floor. And for the knowledge of the working process there are two aspects that need to change: processes and behavior. And you can only change behavior when you can support the change in behavior and when you are consistent. In decision-making and changing organizations, the top of the organization is interested in changing the direction with the implementation of IT.

You mentioned before that there are people who do research in the organization, they try to identify the needs and processes that have to be covered...
What the department offers to their employees is growing process of years. With the computers you can follow the interest of people, so that you can decide also some services. So this is what the top see, we get better insight in what to offer to our employees. But you also need the support of the facility management. In my opinion it is facility management that supports the primary working process and policy making. So when you offer computers like this, the policy makers can work. It is important that you know exactly how you can support it in the best way, in the most modern way. We have some people that set up a small organization and organize meeting with the people of the ministry. “Based on the figures we can see that there is more demand for iPads than for laptops. And it seems that most people want the blackberry…” So you can talk about that people want this and that… It is nice to be in balance with the money that is available. And first we have the facility management, IT, and now it’s combined. So by following the behavior of the client you can enhance your process. And that is the basis for the analysis. Figures are convincing for the policy making.

Is experience important?
For the decision makers? No. What is more important is that they have good advice. And when you are growing in a process from department to department then it’s important for the decision-makers to choose IT that is really supporting the employer. Because some systems are awful and it takes a lot of time. It must be easy and able to communicate with the whole organization. And also, to make a good
decision for the goals. And that is what you see in that in government a decision influences more budgets and then they change the original aspects. And that is very bad for a huge changing process.

Is it difficult to gather all the necessary information?
Yes. It is a difficult process. Because people that participate in the decision making process have their own perspective. And then they don’t make hard decisions. They make soft decisions so that different people have their own interpretation of the decision. And that’s a problem. The department have different aspects that are important and it’s very difficult to make a decision from the perspective of common importance. The government wants something and there is a gap between policy and reality, so the decision makers try to make decisions and make compromises. Sometimes members of a team in the next meeting have gone another direction or have changed their minds.
The process of the decision making depend on the level. When you want change in an organization, policy influences the decision maker. Because policy is always compromise. The policy makers at the department have to deal with a lot of changes. So they can agree on some aspects regarding facility management or IT and then they make compromises to bring those together.

Can these decisions be made intuitively?
I think you need a plan when you have a big change. Because it is written in a document and when you are the leader in such a project you can refer to this document. This is what you have to do, in that time, in that way. What is important in the plan is that you make it possible for the employees to talk with the leader and deliver ideas because people on the work floor know best how it works. When you take the employees seriously in a changing process they are more flexible. My experience is that because you listen to them they feel ok, accepted and they like to change.

Do you think that decisions regarding IT are different from other kinds of decisions?
No. I think it is difficult because IT systems are to support the organization. It is an instrument. In choosing the IT systems, the people that work with these systems are not able to ask questions. People, the specialists in IT they are going to be the decision makers. Someone choosing an IT systems must think what do they need to support the change and the IT specialists have to work out how to realize this. IT specialists are more dominant in the decision making process than the leader of the business process. The person who is working with the content of the change has to be stronger. And that is the reason why so many IT projects went wrong. That’s why I want a plan. Because it is written. So what you want to choose must be clear.

Is there a difference between the public and private sector in these processes?
I don’t know. Because when it goes wrong in the government you see it in the newspapers. But about the private sector you don’t know. I’m sure that some things go wrong there as well. In the government it is more careful.

In the public sector is intuition oppressed?
No, I use a lot of intuition in a plan. You don’t have the plan in detail. The plan is an instrument for people who want to object to it. It manages the time. When we come to the conclusion that our
direction is wrong we bring it in the steering group. We have a plan for the time. Last year, in one of my jobs I started with a plan, and we did it in a totally different way. Because when you notice that your plan is not working you must be flexible. You have to take another way. But I keep in mind the headings. Sometimes I change minor things. It is legal to work a lot with intuition. It is one of my best guides.

_Do you think that leaders manage not to be afraid to use it?_
Yes. I work my whole life in the public sector but my handling is like in business. When you make an appointment, you have an appointment. I’m very clear about it. But a lot of people don’t make clear decisions. They look the other way.

_Why do they look the other way?_
They like to be nice, to be the good boy or girl. Mostly men.

_Do they face obstacles?_
I think that women can deal better with emotion and men cannot handle the emotional aspects. They cannot handle the other’s emotions for their own decisions. And women can deal with relations better. Men show behavior that they have anxiety to be straight and say the truth.

_Do you use emotion to lead?_
Yes. I believe in working in team. In a situation I had to set up a new IT system. When I don’t know the content I look for a team and organize some meetings to create a safe atmosphere so they can say things and they can advise you in an open way. Once we had a meeting all together and every two weeks I spoke to everybody about what is going well or what is going wrong and also about personal aspects. Then very early you notice what is going wrong. People feel that they are being heard. Most of the time we don’t have a lot of time for these projects. Every organization has its own processes and as an outsider you must have insight in the organization fast.

_What you be your advice to managers in this position?_
They have to make a good analysis, to know what they need and don’t do it on their own but round themselves with good employees. One of the qualities that managers need is to ask good questions. That’s my second nature. And combine the questions to make good decisions. And don’t make the decisions on your own, learn from mistakes of other organizations.

Interview 8

(Consultant, Private sector)

_Have you ever had to choose for new information technology for an organization?_
I have done that. As an end responsibility, where it stops, in a lot of companies people say they decide but they don’t decide.

_What practices do you usually use to come to such a decision?_
First what I need now, what I’ll need in the future. This is a strategic decision, strategic way of
thinking. Then look around in the world, find evidence. What can I find in the world? What could be a
solution? This evidence is possibilities for what could be a solution. Look in the outside world. And
then I have other groups who look for the same, do the analysis. And in the groups there should be
different kinds and roles, users, insurance people… Mix some people and activities they do. I follow
their thinking and check with my thinking. Then I pilot the solutions and then of course I must have the
budget to invest on a solution. I also look at risk reduction. Then I make a decision and hope it works.
Usually it doesn’t. But to be honest, once, one group said one thing and the other said another. And I
had to make a decision. And I couldn’t decide. In the end it was a good decision. Both choices were
very good, so I just chose one. But then of course you have to explain it. I didn’t tell that. I had a
strategic story. Mintzberg says that most of the decisions are made among the lines of experience,
concept and art. If you ask someone in a company how they make decisions, they will all say
rationally, or by experience, but the most important decisions are made intuitively. Kahneman says that
rational thinking is very slow. Fast thinking is about knowing. In hindsight you say it was a good
strategic decision.

What practices do you think managers usually use to come to such a decision?
A lot of managers listen to their consultants. They believe in certain technology. IBM, Apple… What
they are hooked to.

What information is crucial in such a decision?
First of all what do they need. And in the future, what are the possibilities. Can I make changes? Can I
opt out? Opt in or opt out? And the fact of time.

Do you think that managers have all the information needed to make such a decision?
Yes, I think they have all the information. But in the end technology is predictable, how it works. And
always go for old things if you can, not new. Go for the proven concepts. The ones we know work
already.

How important is experience in decisions regarding information systems?
I think experience is really important. If the world is unsure, if managers have the feeling they can do it
it helps. Being sure to take the steps.

Do managers make decisions individually or in teams?
In the end someone has to say “Yes” or “No”. Generally in IT systems, there are people who are fore,
and people who are against. It’s difficult to know the right way. You can’t be sure. It’s not easy to
decide. So you must do it in groups. If it’s a complex situation, we need more brains, thinkers, more
input, different ideas and perspectives. Working with people, in teams, is ok, but with the right focus.
Teams don’t necessarily participate in the decision-making process. They help gather the information.
They must have a strong story about what they think, what should we do. The decision is easy. Making
a decision is easy, as an individual. It’s the consequences that matter. Making a decision is more
difficult as a team. You need the same story, the same feeling of necessity.
How do you assess the current state of your organization? What is usually the expectation after implementing a new information system?

IT is a tool. It’s like clothing. You can’t do without it. You’re naked without it. It’s a necessity. It forms us. What we can do, what we cannot do. And it has to fit. For a person, organization, group, country… it’s part of this world. It should fit the organization, and the environment of the organization. In a way this question is crazy. There should be a feeling of comfort. It depends on the people, on the culture of the organization, on the environment.

Do decision regarding Information Technology and infrastructure differ from other kinds of decisions?

If it’s not a proven concept, and it’s part of a strategic way of thinking it’s a big risk. It costs a lot. There’s a lot that has to change. And because it is risky and they are unsure they make coalitions with other managers, with technology companies, to help each other in a way. They decide and work together. If technology is not proven you have a problem. And even if it is proven it requires a lot of change.

Is making decision intuitively considered a legitimate way? Are there issues?

Intuition is not legitimate. IT maintains the myth of rationality. But in reality it usually goes wrong. Only the proven concepts work.

Interview 9

(Manager, Public sector)

Can you tell me a bit about what you do?

This year there have been some changes in [organization x], and one of the main tasks is the tech program, because there is a big backlog in ICT. So the technical infrastructure - computer, networks, computer centers – there is a lot of old equipment and software. That is one problem. The other problem is that the employees need good technological support. They spend a lot of time behind their desks typing information. So there is a big program and we supervise that program. So we are not directly involved in choosing one type of IS or the other. For instance, if there have to select a financial system we don’t tell them that it should be A, B or C. they have a selection process and then we check if that process was performed well.

The process that they follow what steps does it involve?

You have to define your functional, technical and user interface requirements and then you check whether there are any products in the commercial market that can fulfill those requirements, or you have to build the system yourself. Until now most operational systems are build by the organization. And the systems for the management, financial, personnel, facility management are bought. You have to decide to make or buy, sometimes it is make and buy and then you buy or start building the system, implementing, supervising the users of the system. That is the normal approach.

Do they have all the information that they need in this phase?
I think that there are two important phenomena, one is because of the structure of the organization. It was very hard to get consensus on the requirements. The only way to get it was to fulfill everyone’s requirements. Then you end up with a big system that has to fulfill all those requirements and also, should be able to support the different operational processes. And another thing is that the operational processes are very different now. It’s hard not only to find the requirements but also to implement the system. And that was very cumbersome. They have a list of requirements but it was too complete. It would be better to start with restructuring and uniforming the processes. Then they would get a more simple system.

Do they work in teams for this purpose?
Yes. My experience is that the cooperation in teams at the operational level is ok, but at a certain moment when you have to decide on a management level, what the final requirements would be, it is a lot harder. Until now, all stakeholders together had to decide on the requirements and what system to choose. There was no one who would decide on something and take responsibility. It was a very time consuming process and of them would always say “I don’t like this, I quit. I want my own system”. Hopefully these situations don’t exist anymore because we have one manager and we expect a lot from him. To standardize the processes and everyone to use the same system. We expect a lot of him.

Is experience important in these kind of decisions?
The heads of the departments are very well acquainted with the operational processes – what they want out of the system – but they are not very well experienced in buying software systems and managing programs for building systems. Many ICT people have a different background. They started in the organization and ended up in ICT. You could say that the ICT personnel is not up to the level that you would expect, for such a big organization. So at the moment we also invest in education and training, hiring people. That is hard for governmental organizations because you can’t pay market salaries. So its difficult to have experienced people.

Since they are not so experience in ICT, can they make decisions following their gut?
If you take a look back in time, a number of systems that were bought or built, they were wrong and we hope that the number of successful decisions will rise in the coming years. On the other hand you could say that the operational employees, as a consequence of bad decision-making don’t have the best tools for their work. A lot of time is spent behind the desk, typing and there is a lot of possibilities to improve their work. That is the main challenge for the coming years. First priority is to take care of the technical infrastructure and from this year on we start on improvements for the systems of the employees.

How do you prioritize these improvements?
We have a prioritizing mechanism. They priorities are not very detailed. We analyze the effect on ICT and we get a list of priorities on the area of business information systems. The employees themselves on the operational level also have priorities and the CIO proposes a project portfolio every year. That is always a combination of technical infrastructure, operational and priorities on the management. The money we have for ICT and the available personnel are set for the portfolio.
In a higher level there is no room for following a feeling?
In my experience, there will always be some kind of dealing between the different stakeholders. So we have a rather mathematical mechanism for prioritizing. A long list of all the projects. And we score on the importance, we look at the urgency, the risk, the dependencies. But we always have a check from the political, governmental, operational point of view. Whether those priorities match the gut feeling of the stakeholders. Sometimes unexpected things happen. Things that are on the bottom of the priorities list, people say because of political reasons that have to be up. And that is hard to grasp, but it is the political gut feeling. The mathematical part is a nice starting point of discussion. But from the political point of view and the operational point of view we always do a check. Whether it matches the gut feeling.

And when someone has this gut feeling. How do the rest perceive it? How do they react?
Then there is the bargaining process. All kinds of things happen. Sometimes they compete with colleagues “Good argument, we support you” or “If I support your priority, you should support mine.” It is really a bargaining process. There are always surprises. What really makes decision making difficult is that the CIO prepares the project portfolio but he is also one of the decision makers in the sense that he also puts forward priorities. At the moment he has a very long list of technical priorities – enlarge bandwidth, replace Microsoft office with a new version etc. – a long list with topics but he does not have the support. The operational managers have to believe in him that all these things are necessary. My opinion is that there is insufficient proof or argumentation why those technical things are necessary. The role of the CIO is complicated because on the one hand he has to be independent and to prepare the prioritizing process, but on the other hand he is also one of the people who puts forward priorities. At the moment we don’t have a good grip on that. We had a plan for the coming four years. They told us that a very large part of the total budget we have to invest in technical priorities. Sometimes, when there are very expensive decisions, we do external reviews.

Are decisions regarding IT the same with other decisions in an organization? Do you follow the same processes?
Yes, I think so. There are two complicated factors. ICT has a lot of political attention. So everything that happens, when things don’t go right, we have questions about what happened. The second thing is that when you have to buy things from the commercial market we have European regulations. We had a few incidents that procedures were done the exact correct way. Those are two important things for the organization.

Interview 10
(Consultant, Private sector)

So you have a set of questions for me. But you must be clear in what kind of role you ask me. Do you ask as a manager in my own little IT world or as a consultant who knows about IT systems of customers?
I would prefer the second one. So you yourself haven’t been in a position to choose for an information system for an organization?

No. I started as a consultant ten years ago. Before that I worked for many years at [company x]. There I also made decisions about IT but that’s a long time ago. Now I can answer your questions from the perspective of a consultant who knows about IT with his customers.

So you’ve seen such changes in organizations?

Yes, they hire me for it.

So, when a manager wants to choose for a new information system, could you describe the process that they follow until they reach a decision for what to implement?

That’s an interesting question. There are two ways to answer it. First, the formal – how it should be. In this case there should be a question: “What’s our problem?”, then these should be some kind of a design, and there should already be some kind of an architecture in the company and a list of what the company wishes for and there’s a list of possible suppliers… there’s a whole process for it. That’s the formal way.

Reality is completely different. For example, in [company y] they had a very large IT system, which has to be very stable and reliable. But then they have some money in stock. And they have to make profit every year, in the stock market to make sure that they are able to pay the next years. So there is a group of investment bankers, who have to use that money and invest it. If you know a little bit about the stock market, one day it’s up and the next day it’s down, so if I put one billion euros in shares, I have to sell if it’s going down and then I have to make all kinds of immediate decisions. So it has to be a very stable, reliable system on the one hand, and on the other hand we have these bankers who have to make decisions now. Two seconds later it costs them hundreds of millions of euros. So this is very opposite. And the have an architecture of this IT system and it needs to be reliable on the one side and flexible on the other side. And you can understand, its quite complicated to be flexible with billions of euros. So there’s always a fight. And the soldiers are the architects, the IT architects. The IT architects say “You want to be flexible, I understand. But we cannot do it, because we have to be stable. We must have a stable system. It does not fit in our architecture. Maybe in 2018, but this year no.” So there is always this fight. And then, the people from the administration they want to keep it always the same. Because for the system to change it is very dangerous and it works today, so we keep it as it is and it will work tomorrow in the same way. We don’t do any change. And they [the bankers] have seen a system, a new calculations system and they want to implement it tonight so we can use it tomorrow. So there’s always a fight. That’s the first thing. The second thing is that this formal system is having a plan. But these investment bankers they don’t look at plans. They see a systems, like the new Bloomberg and they think “That’s a great system, that’s what I need.” So they buy the Bloomberg system, they bring it to the architects and they say “I don’t care how you do it but is should be running tomorrow.” That’s how it goes, they don’t look at any specifications, they don’t make a plan, they just want to have that new Bloomberg system. Cause they saw it in New York, it was great. Their heroes use the Bloomberg system – they also need the Bloomberg system. That’s how it works.
if they were to use the formal way of making decisions, would they have all the information they need at their disposal?
I don’t know because the formal system is not used. The formal system is used by control. By the control department who check if it was all done in a proper way.

Afterwards...
Afterwards. Of course.

After the implementation of the system and if the control department says that it was worth the money spent, would the investment bankers consider this experience useful, would they think that they could do that again successfully? Would they do it again?
Yes, because they don’t know any other way. What’s behind my story is that the formal thinking people are in the IT departments. They look at the world as something you can plan. Therefore they make plans. They want to check if the plans work out. The investment bankers have a different perspective of the world. They have a completely different way of looking at the world and they don’t work according to plans because they know that everybody works according to a plan, and if they work according to a plan they get what everybody gets, so they have to be more clever. The investment bankers are very competitive thinkers. So they will never do what’s in a plan or what everybody else is doing. If you send them a plan, “This is the formal process”, they say “That’s good to know.” But this is not the way to do it, cause this way they get what everybody gets. The administration guys think that life is a system of steps. But the bankers have to be adventurous. So they will never act according to a plan because they know that it will not be successful. So it’s all about perspectives about how you see the world.

So it is about being intuitive...
For the bankers. Its not intuitive for the administration guys, who need a stable administration system.

But do the bankers influence the management?
The problem of the IT department is that they are in between. They are always squeezed.

If they do something and it’s successful, new, exciting and different that everybody else doesn’t this affect the administration? Don’t they think that the bankers are right?
That’s where the fight is. The administration guys don’t want any change because any effect will harm the basic system, so in between is the IT and the fight is fought by the architects. The IT architects talk to the administration who say “we have to keep the system solid.” And the say to the bankers “we have to keep the system solid, that is why we cannot use your system”. They are the front fighters and they need an architecture for it, so they have architecture documents. They hire academics who help them make an architecture document which shows the IT system, what can be done and what cannot be done.

For the administration now, who don’t follow their gut, is it just because they want a stable system or is there also something else that hinders them?
Basically they want a stable system. And now we come to the basis behind that… There’s two kinds of jobs you can do. You can be at the administration or you can be a banker. And you can make the choice. Depends on you character. How you look at the world.

Do you think that both these approaches work? Are there organizations who work only one way or the other and they succeed? Or do we need middle ground?
I think they can both be successful if you keep it separated. In the end it’s about money. The ideal would be if they had a system for each side.

For these decisions do they work individually or as a team?
Usually someone comes up with an idea and then they try to convince their colleagues that this is the right investment, the correct thing to do. I think that bankers always work like that.

If one of the administration guys has an intuition, what is it that holds them back?
They take the architecture seriously. They’re going to ask their boss if there’s a possibility for a little improvement. Then they are going to check if there’s room for improvements in 2018. They’re on the stable side, so there’s a list of possible improvements. In [company y] there was a list of 2000 projects for this large IT system and there was a plan, so if an improvement was project 1800, you have to wait. So they make a plan, and in two years this project will be executed. It goes through reasoning again. There may be an important project that should go earlier. There are architects and portfolio managers to put an order in these different ideas.

So they would use this method again to respond to a big change?
Yes. The architects and the portfolio managers organize that together.