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## **IT PROJECT PRIORITIZATION PROCESS: THE INTERPLAY OF EVIDENCE AND JUDGMENT DEVICES**

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### **Abstract**

*In most of the large companies IT project prioritization process is designed based on principles of evidence-based management. We investigate a case of IT project prioritization in a financial institution, and in particular, how managers practice evidence-based management during this process. We use a rich dataset built from a longitudinal study of the prioritization process for the IT projects. Our findings indicate that managers reach a decision not only by using evidence but from the interplay between the evidence and the judgment devices that managers employ. The interplay between evidence and judgment devices is manifested in three ways: supplementing, substituting, and interpreting evidence. We show that while evidence does not fully determine the decision, it plays a central role in discussions, reflections, and negotiations during the IT prioritization process.*

*Keywords: IT project prioritization, Evidence-based management, Judgment devices*

## 1 Introduction

Organizations have numerous proposals for IT projects, but only limited resources to implement them. Within these constraints, decisions must be made in building a suitable project portfolio (Archer & Ghasemzadeh 1999). The most popular IT project prioritization methods, according to both scholars and practitioners are the financial methods which present the prioritization decisions as evidence-based rigorous comparison of figures (Kester et al., 2011; Dickinson et al., 2001). However, recent research has shown that companies which base their prioritization decisions exclusively on financial methods perform worse than others which use a mix of different methods (Dickinson et al., 2001). At the same time, the recent advent of evidence-based management, highlighted the concept of evidence, which has gained prominence both in academia and among practitioners. A growing number of studies have repeatedly called for more quantitative data to improve evidence-based decision making (e.g., Rousseau, 2006). Researchers depict evidence-based practice as “a paradigm for making decisions that integrates the best available research evidence with decision-maker expertise and client/customer preferences to guide practice toward more desirable results” (Rousseau, 2006, pp. 258). Common to these studies is the understanding that managers are empowered when they have accurate facts, which in turn lead to less biased decisions, thus increase organizational performance.

Inspired by these recent developments we set out to investigate the role of evidence in the IT project prioritization process. We investigate the prioritization process of IT projects by focusing on how decision makers use evidence in order to reach a decision. In our case the evidence is the use of scientifically proven financial models to derive data such as measures of costs and benefits, which are expected to be the product of rigorous analysis derived from state-of-the-art information processing systems. We use a rich dataset built from a longitudinal case study of the prioritization process for IT projects. The empirical setting of this study is a division of a large Scandinavian financial institution. The study presents a small portion of the life of this organization. In a period of eight months we observed the prioritization process and collected various forms of data about it. Hence, our research question is: *How do decision-makers use evidence in the IT project prioritization process?*

We found out that decision-makers also employ judgment devices which are defined as any tool used to make an informed judgement about a project or other products (Karpik 2010). Particularly, our study exemplifies the importance of using judgment devices along with financial data in IT project prioritization. As such, our study depicts the interplay between evidence and judgment devices in this process. We explicate how decision makers develop tactics to address the unstructured and complicated problem of IT project prioritization. Our findings provide insights on how managers cope with the ambiguity and uncertainty underlining IT project prioritization and the shortcomings of evidence.

The paper is structured as follows. The next section presents the theoretical background on IT project prioritization and evidence-based management to position our research. Then, we present the research method followed by the description of the empirical setting. Next, we present our findings and discuss our contribution. The paper concludes by highlighting future research directions.

## 2 IT project prioritization and evidence based management

The topic of project prioritization has been extensively covered in management science since the 1960s. Many methods of project prioritization have been developed, but they have not been successfully adopted by organizations (Martino, 1995). The studies in this field are mainly prescriptive and financial models dominate as a solution to project prioritization (Bardhan et al., 2004; Cook & Green, 2000). The literature is vastly based on a normative discourse which advances by offering a range of techniques and methods to provide solid information to decisions makers. The downside of this discourse is the lack of emphasis on adapting the proposed models in the complex real-life context. These prescriptive studies presume a cycle of investigative, analytical and review steps, with systematic evidence infused at pre-determined stages (Archer & Ghasemzadeh 1999). Project selection and prioritization problems are generally addressed within a broad portfolio management framework (Engwall & Jerbrant, 2003). Portfolio management is a financial method

for administering financial investments, which uses portfolio perspectives to find the most optimal mix of stocks or bonds (Fitzpatrick, 2005).

As project prioritization literature, the IT project prioritization inherited many of the methods that were created and promoted by the New Product Development, Research and Development, and Project Management literatures which focused on methods of selecting and prioritizing an optimal portfolio of projects (Ghasemzadeh & Acher 2000, Stamelos & Angelis 2001, Dickinson et. al. 2001, Loch & Kavadias 2002, Bardhan et al., 2004). At the same time, organizations, in an attempt to justify IT investments, have adopted these methods (Farbey et al., 1999) where analytical mechanisms are proposed to make prioritization decisions. These methods, however, have been the subject of extended criticism because of their narrow view on the nature of IT and its impacts (Ballantine et al., 1999; Smithson & Hirschheim, 1999; Howcraft & McDonald, 2004). A number of researchers argue that the process of IT evaluation is both subjective and contextual (Smithson & Hirschheim, 1998; Farbey et al., 1999; Howcraft, & McDonald, 2004). Intangible and non-financial benefits comprise a large portion of IT projects' returns and it is nearly impossible to calculate hidden and indirect costs before the development and implementation of IT projects (Muralidhar et al. 1990). According to Bannister & Remenyi (2000), these limitations of existing evaluation methods force decision-makers to base IT-related decisions on 'gut feeling'.

More recent IS research has broadened this narrow focus by looking at how organizations coordinate selection and prioritization decisions (Fonstad & Robertson 2006, Weill & Aral 2006, Weill & Ross 2009). Further, Fonstad & Robertson (2006) call for more empirical studies on the linking of IT selection and prioritization decisions, and organizational actors. However, taking into account the extensive research and evidence that is provided by the current literature of the IT project prioritization, organizations should measure and select their portfolio of projects based on measures of ROI and cost-benefit analysis in order to choose the optimal portfolio which will provide the maximum benefit to the organization. The current literature suggests an evidence-based management approach in prioritizing projects by promoting methods that condense projects in comparable numbers.

Evidence-based management derives from evidence-based medicine, an approach which guided clinicians to make decisions based on "the best available evidence" (Sackett et al. 1996). The best available evidence refers to the converged opinion of the scientific community, based on rigorous methods, about what works and what not. It allows the identification of cause - effect relationships that would replace "formal authority, reputation, and intuition" (Pfeffer & Sutton 2006, pp. 79) or untrue beliefs held such as conventional wisdom. Rousseau (2006) referred to evidence as the product of scientific inference while being "skeptical about experience, wisdom, or personal credentials as a basis for asserting what works" (ibid., pp. 268). Her claim is that managers' experiences are "subject to perceptual gaps and misunderstandings" (pp.201) due to poor feedback on decisions' outcomes and consequences (Rousseau 2006).

The evidence-based practice has also had a big impact in public policy programs. Neylan (2008) reports that in practice statistical data and quantifications have a regular presence in policy making. Furthermore, Neylan (2008) states that quantification is a key device in negotiations and is used coercively to support bargaining points, rationales and justifications. Traditionally, knowledge generated by applied research has been seen as the 'evidence-base' for evidence-based policy (Head 2008). However, as Nutley et al. (2002, pp. 9) claim, "simple and unproblematic models ... where evidence is created by research experts and drawn on as necessary by policy makers and practitioners – fail as either accurate descriptions or effective prescriptions". For effective policy programs Head (2008) suggests that the ultimate evidence base should be a collection of political knowledge, scientific research and professional practices. Thus, he makes space for alternative types of information in addition to scientific evidence. In this study, we conduct a case study to investigate how managers practice evidence-based management in the IT project prioritization process of a large financial institution in Scandinavia.

### **3 Research method**

The empirical basis for this research was an in-depth case study used to explore IT project prioritization and how decision-making is practiced in this context. The empirical data was collected over a period of approximately eight months and focused on the organization's IT project prioritization for 2011. In order to

understand the IT project prioritization process in a complex organization, several data collection techniques were applied: real-time observation, recording of meetings, semi-structured interviews and collection of written documents produced by the organization.

Real time observations took place in two subunits of the IT unit where one researcher observed managers in their natural setting. The observations primarily served to establish an understanding of the activities of the two subunits and the context in which IT project prioritization takes place. The richest sources of empirical data about the prioritization process are the 43 semi-structured interviews with the managers, which were transcribed ad verbatim (i.e., approximately 730 pages), and eight recorded meetings, which also were transcribed ad verbatim (i.e., approximately 170 pages). We followed an evolutionary, iterative approach where the activities of data collection supported each other throughout the process. For example, the meeting observations were used as input in the follow-up interviews that were conducted in a later stage.

Initially we conducted semi-structured interviews (from April to June 2010) with stakeholders from different levels and units of the organization who also participate in prioritization groups. The interviews provided personal views of the current prioritization process, its context and the history of the process. From these interviews two main stakeholders were identified. First, the IT unit, which owns the project prioritization process and executes the prioritized projects. Nineteen interviews were performed with stakeholders from the IT unit at different levels of seniority. Second, the business units, which are responsible for product-related functions and actively involved in the project prioritization process. Eleven representatives from different levels of the business units were interviewed. All interviews were semi-structured in which open-ended questions were asked about the prioritization process. Each interview lasted on average 50 minutes.

Then, we observed meetings (from June to October 2010) where the participants produced a prioritized list of projects. We followed two subunits of the IT unit and attended their prioritization meetings. From these meetings we collected documents such as minutes, presentations and any other relevant material that was sent to the participants. These observations led to thirteen follow-up interviews (from October 2010 to April 2011) and a review of additional background material. The follow-up interviews were semi-structured and carried out with participants from both subunits. The additional background material included documents such as power point presentations, meeting minutes, forms, spreadsheets, reports, organizational charts and memos.

For the purposes of getting a detailed overview of the empirical setting and identifying how IT prioritization process unfolds, we carefully read all transcripts of the interviews and the meetings as well as the background material and field notes. In order to investigate our research question we employed constant, comparative techniques (Strauss, & Corbin, 2008; Suddaby, 2006) whereby we analyzed qualitative data in a systematic and iterative manner. The analysis evolved into an iterative process where data were compared with emerging themes in a cyclical process inspired by Miles & Huberman (1994).

As a first step in the data analysis we developed a timeline of the IT project prioritization process and its phases. This timeline helped us understand the prioritization process. In the next step, we read all documents and meeting transcripts to identify components of raw data across the different sources, paying special attention to passages which captured ideas and themes such as “costs”, “benefits”, “intangible benefits”, and prioritization criteria. We organized these first order codes into tables that supported a single theme across the various data sources, inspired by the in-vivo coding technique (Strauss, & Corbin, 2008). In the next step, we developed the second order categories by using four key questions to sort through the raw data (See Table 1 as an example of developing the second order categories). Those questions were 1) What are the common criteria used in IT project prioritization? 2) How are these criteria used in the decision process? 3) How do decision makers use financial data in the prioritization process? and 4) What is the role of decision makers’ experience in the decision-making process of IT project prioritization? In the final step, through an iterative analysis, “supplementing”, “substituting”, “interpreting” and “reframing” evidence in relation to “reaching a decision” emerged as “transparently observable” (Eisenhardt, 1989: 537) phenomena in the data, which we use to present and discuss our findings, inspired by Pratt (2009) and Rerup & Vendelo (2011). The next section presents the empirical setting. Please note that the names of the firm and the individuals portrayed in the analysis have been changed in order to preserve their anonymity.

First order codes (raw data)	Second order themes	Aggregate Dimensions
<i>"It's not just benefit-cost ratio, it is much more and if we combined those things then we think that we get a nice view on this [the project proposal]" (SSG Meeting 1.2)</i>	Supplementing evidence	Tactics for reaching a prioritization decision
<i>"I don't think it's a benefit discussion it's much more whether actually it's worthwhile doing it." (Business Representative 3)</i>	Substituting evidence	
<i>"I interpret the reports and I make statements on what I see as the outcome from the analysis of the report." (IT Finance Manager)</i>	Interpreting evidence	
<i>"So I will not tell them... since I am not being rewarded for being honest about the total costs of ownership, I'll simply cut down on the information." (Business Analyst)</i>	Re-framing evidence	

Table 1. From raw data to aggregated dimensions in the PG level

## 4 The empirical setting

The study was conducted at the IT unit of an international financial institution with headquarters in Scandinavia. We chose this specific setting to investigate the project prioritization because it has a strong tradition in using financial models and objective measures such as costs and benefits in forecasting activities. The IT unit is in charge of standardizing and automating processes and developing IT systems to enhance efficiency in the organization.

The prioritization process takes place on two different levels: the Prioritization Group (PG), where projects from a specific area are gathered and prioritized, and the IT committee, where all the prioritized lists from the PGs are consolidated and the budget is distributed across the different PGs. A PG governs the activities in a specific section of a development area, and its members are responsible for deciding which projects are to be undertaken by that section in the year to come. There are 21 PGs in the IT unit of the organization.

Before the PG meetings the organization prepares proposals for new projects to be included in the prioritization process. Typically, the preparation of a project proposal involves three sets of activities; generation of new project ideas, consulting about and review of new projects and informal discussions of project proposals. The PG meets four times per year, i.e. quarterly. In the fourth quarter meeting the PG members approve the list of IT projects to be funded in the coming year. Once the PG members have approved the prioritized list for the following year, the list is forwarded to the project portfolio managers. All projects are inserted into a spreadsheet, along with information such as net present value, costs, number of employees, benefits, time schedule, sub-deliveries, project phase, releases, business drivers and strategic focus area for each project in the list. The portfolio managers analyze the whole portfolio and provide the results to the IT committee.

The IT committee meets six times per year. Each quarter there is a meeting to update the committee on the progress of the projects running in each PG. Budget changes are approved or denied and projects are reprioritized if necessary. Two additional meetings are conducted in which the agenda includes defining strategic focus areas for the IT unit. In the last meeting, the committee meets in order to approve the overall IT portfolio of projects for the year to come. Two weeks before the final meeting, the members of the IT committee receive project-related information for each PG. The information includes a brief project name and description, the Net Present Value for two and five years, total costs and benefits, its priority number in the list and the strategic focus area of the project.

### 4.1 Prioritization in the PG meeting

A project prioritization meeting in a PG lasts from one to two hours. The members include the development manager or managers, the director of the departments involved in the specific PG, and the development directors of other interrelated areas. Additionally, business representatives interested in the proposed projects, IT people specializing in the projects' respective domains, the CIO and the COO (Chief Operation

Officer) are members of a PG. The development manager, who serves as the secretary of a PG, is responsible for managing the prioritization process in the PG.

Before a prioritization meeting, the secretary of the PG prepares a slide presentation that includes the agenda as well as a preliminary prioritization list. All projects are presented in a spreadsheet which includes standard information such as: net present value, cost estimates, full time employees (FTE), benefits, time schedule, sub-deliveries and releases for each project. The presentation by the development manager includes 1) the ongoing projects, 2) the compliance projects undertaken in order to ensure that current legal requirements are fulfilled, and 3) new business projects. For new business projects the cost-benefit ratio serves as the starting point of the discussion while project-specific arguments follow. A sponsor of a new project presents the facts and is challenged by other members to explain the business rationale behind the project, e.g. the cost savings compared to that of other project proposals in the list. The decision makers alter the list by making decisions on the final ranking of projects during the meeting. The managers highlight the lack of process transparency of the prioritization process, which is manifested by the lack of explicit information requirements for new projects. The managers also underlined the lack of clear overview on project interdependencies. Strong project interdependencies do not allow for flexibility and changes during the year, like re-prioritizing to accommodate for market developments ensuing from competitors' activities. Another challenge, according to the managers, is the technical complexity of the projects, which cannot be captured by the data and may lead to significant increases in costs. The main problems with using financial data and facts as prioritization criteria, according to managers, are the inaccuracy of costs and the unreliability of benefits' calculations. The managers respond to costs and especially benefits' estimations with disbelief and a sense of irony, which became evident during the interviews. Additionally, the lack of an institutionalized way to follow up the benefits and assign accountability for their realization enhances the managers' negative attitude towards them. IT project prioritization at the PG meetings is viewed as a "*Turkish Bazaar*", where the person with the strongest voice succeeds. Strong negotiations are undertaken for resource allocation among new projects as well as for dealing with the unplanned cost increases of running projects.

Before the meetings managers engage in informal communications in order to better understand the proposed projects and their impacts as well as to become aware of each other's opinions. The managers used the term "sponsoring" to indicate the support of stakeholder groups for a project, which has a strong influence in IT project prioritization and provides an additional mechanism to inform the managers' judgments. Managers also underlined the importance of dialogue, enabled by the evidence provided in the meetings, as a way of exchanging information and better understanding the project's impact. Although managers refer to the limitations of evidence in the form of financial data, they acknowledge their pivotal role in fostering dialogue among them, stimulating reflections and discussions around intangible factors.

## **4.2 Prioritization in IT committee meeting**

The IT committee meets for the final prioritization meeting during the last quarter of the year. The IT committee has six members; the CIO, the COO, the CFO, the senior representative of the business units and two members of the executive board. This final meeting of the IT committee consists of two phases: first, the chairmen of each PG (usually a senior business representative) give a half-hour presentation for the IT committee where they argue for their prioritized list of projects; second, a private meeting takes place between the IT committee members in which they determine the final prioritization across the PGs. During the presentations, the chairmen present the projects approved during the PG meeting and their importance to the organization and the organization's goals. The development director, who is an expert in the IT issues of the specific section, is present as well. After the 30-minute presentation the chairman and the director are challenged by the committee members on the number and priority of the projects and the rationale behind the overall prioritization of the PG. The members also ask many questions in order to investigate interdependencies between projects and the consequences of cutting projects from the list. The chairman and the IT director argue and explain why the organization should invest in their PG and approve projects that they propose. After all the PGs have presented their project lists, the committee members gather and discuss how to distribute funds amongst the PGs and their projects. In this phase the members of the IT committee focus on the future direction of the organization and decide which PGs' budgets they should increase or decrease in the coming year.

The participants of the IT Committee rely on the expertise of the PG managers who included the projects in the prioritization list and do not investigate the inclusion process. The IT Committee members underlined the difficulty of comparing benefits between projects and especially between projects of different areas. They also highlighted the problem of lack of follow up on benefits and absence of accountability for those benefits, showing their distrust of the calculation of benefits. Besides, they were concerned about their ability to have a portfolio overview and take a holistic perspective. Project interdependencies further complicate the IT prioritization process and budget allocation for each area, since a budget cut in one area may influence projects in other areas. These project interdependences are not obvious and can only be discovered through deeper involvement from the managers in compiling projects details. A recurring question asked during the IT committee meeting was how removing one project from the list would affect other projects.

Informal communication is very important at the IT Committee as well, since the managers need to have a holistic view of the IT unit's needs and to be able to understand the estimations provided for each project. Informal communications are critical for each representative of PG to present the importance of the respective projects and attract sponsors who participate and support the specific list in the IT committee meeting. It seems that the more powerful the sponsoring the fewer the questions asked about specific projects and the easier it is for the project to be accepted. Similar to the PG meetings, the use of evidence in the form of financial data enables dialogues and creates opportunities to better understand the information provided.

## **5 The use of evidence and judgment in IT project prioritization**

We investigated the decision process on both levels of IT governance in the organization by focusing on the use of different sources of information. We describe the decision process on each level separately in the following two sections in order to highlight similarities and differences.

### **5.1 Decision process in the PG meetings**

The members of the PG mainly referred to evidence in the form of costs and benefits as well as resources (e.g. number of full time employees) as the main prioritization criteria. During the prioritization process, the managers look for comparable information when assessing the projects' facts. They actively seek information about other alternative solutions to the proposed project to facilitate its comparative assessment. This active seeking of comparable information is hindered by the intangibility of project benefits. So how do managers make their decisions about project prioritization in this context? They have to take into account the financial data provided for each project, which despite their unreliable nature constitute the official criteria for the prioritization process. However, the managers also use other types of information in the decision process. The managers described three tactics they use financial data in relation to other information in the decision process.

First, the managers use their experiences or private knowledge as a substitute for financial data. This personal knowledge is used to describe the business case or to estimate the intangible benefits. Sometimes, managers overrule the financial data and use their judgment as an argument for prioritizing a project. It appears that the managers substitute financial data with their own judgment, based on private knowledge, when it suggests the opposite of what the data do, or when there are either little or no data available. The following interview excerpts are representative:

*"I don't think it's a benefit discussion, it's much more whether actually it's worthwhile doing the project"*  
(Senior IT representative)

*"I only can write it down and tell them that this is good for the customers, this is good for the adviser. I believe that in the long run it will be good for the business but I can't show the money"* (Business representative)

In a PG meeting the Senior Business Representative who promoted a specific project did not refer at all to the cost-benefit analysis but rather used knowledge from his network in Sweden to explain his choice. He also noted that a member of executive committee who was also a member of the IT committee wanted to sponsor the project to run on the 2011 development plan. When the relation between the financial data and the other inputs is opposing, they compete and thus sometimes the financial data is substituted with arguments grounded in experts, sponsors, or networks input.



*“The most interesting part of this product is that we actually lack a product that is in the market right now in Sweden. All the rest of the banks in Sweden are comparing themselves against this product and we are the only bank that is not able to show this.” (SSG meeting 2.2)*

Second, the managers sometimes supplement financial data with the other types of information in order to obtain an overall picture of the project under consideration or the prioritization list, as an interviewee explains:

*“I think you should do the best you can within reason to get a cost-benefit analysis in numerical terms and then say this is one part of the equation, but then there are other parts of the equation which are the intangibles” (Head of Strategic Business Unit)*

The managers highlighted the importance of supplementing the financial data with specific information such as market readiness, competitor’s action, comparative information, etc. This approach is used to further support a specific project prioritization by either enriching financial data with qualitative information or by asking for additional information to be provided about a project, based on their personal knowledge. Overall, evidence is supplemented with inputs from personal networks, experts, and sponsors. These inputs provide support to cost-benefit calculations. As such sponsors, experts and personal networks appear to grant trust, legitimacy and a collective flavor to the choice of a project as illustrated in the quote below:

*“We talked a lot about intangible benefits as well, typically what we asked [the idea owners] to do is to identify sponsors at least, we need somebody else who also believes it’s a good idea.” (Head of IT Strategy)*

Third, the managers use their experience and personal knowledge to judge the accuracy of cost estimations and the reliability of benefits as well as to interpret the figures provided in a meaningful way for overall prioritization. It appears that the managers try to contextualize the information contained in financial data. The interviewees described:

*“This means that we ourselves are actually interpreting ‘what does this mean’ and based on our knowledge and understanding of it we make provisions for it in the planning” (Senior IT representative)*

*“We interpret the reports and we make statements on what we see as the outcome from the analysis of the report” (Senior business representative)*

The managers also use some additional tactics to prepare their prioritization list for the IT Committee meeting. They reframe the data to be presented based on their interpretations, they re-calculate a project’s costs in order to reach an acceptable level, according to their judgment and they re-define the project’s scope in order to confine the expectations of the decision-makers in the IT Committee meeting or other important sponsors of the project. They also re-frame intangible benefits to appear more convincing, based on their judgment. Finally, they discuss the presentation strategy for the prioritization list to find ways to make it less debatable in the IT Committee meeting. The interviewees explained:

*“So we will not tell them... since we are not being rewarded for being honest about the total costs of ownership, and that’s more information than they normally get, we’ll simply cut down on the information” (IT representative)*

*“Maybe, the right thing would be to show the benefit of the first step, but also perhaps indicate the full potential, because the full potential is much bigger” (Senior IT representative).*

Overall, managers in PG use a broad repertoire of tactics both in reaching decisions and supporting their prioritization list on the next level. These tactics involve a combination of evidence and judgment in different ways. The managers use various mechanisms to collect information and shape their judgments. The use of these mechanisms is motivated by doubts of the reliability of the financial data due to the complex nature of the IT projects.

## **5.2 Decision process in the IT committee meeting**

During the follow-up interviews, the IT committee members underlined the difficulty of comparing the cost-benefit analyses of different projects, especially between projects in different areas or PGs. This was also obvious during the interview with the COO in which he clearly stated:

*“But how can you compare the financial benefit of a better work force compared to the indirect financial benefits of people using mobile bank and thinking we are an innovative bank, it’s impossible. The theory will tell you, you need a business case and then you prioritize in terms of the data. It doesn’t help. (Follow up on IT committee final prioritization meeting with the COO)*

The managers highlighted the importance of taking a holistic perspective in the final prioritization decision, as well as the importance of experience and personal knowledge in understanding the project portfolio overview and the corresponding interdependencies which may influence the resource allocation.

The managers displayed some degree of suspicion about the accuracy of cost and benefit estimates when the numbers looked unrealistic or when they were framed in an unusual way, as explained during the interviews:

*“If they had focused too much on the benefits I would have reacted because I don’t believe our benefit calculations” (Senior Financial Representative).*

Senior decision-makers underlined the importance of trusting the presenter from the PG since the benefits estimations are not always accurate. In this context, the presenter’s confidence and expertise play important roles in counterbalancing the disbelief about benefits, as described during the interviews:

*“I would trust that the PG would give me a prioritization where they have looked into the benefits not by calculation but by their knowledge” (Senior Financial Representative)*

The managers described how they use evidence such as financial data and other types of information in the meeting. The main tactic is supplementing of financial data with judgments coming from the managers’ experiences and private knowledge. For example, the PG director presenting in the meeting is trusted because of his expertise, which complements the projects’ facts by providing additional contextual information. The managers trust the information provided by specific domain experts along with the financial data about the projects. Sometimes managers also engage in knowledge-based information seeking to enrich the data provided for each project, as they explained:

*“I went through every single project with one of my employees who is involved with most PGs and asked ‘What does that mean?’” (Senior IT representative).*

*“You need to be able to have some hard data evidence, but when I am really confident in this as the right decision is also when I hear the soft parts surrounding it” (Senior Business Representative)*

However, many times it was observed that instead of refereeing on the cost-benefit analysis the IT committee members would refer to the performance of the presenters and the confidence they inspired in them. As such, the decision makers used the performance of the presenters and the impression they made to the IT committee members, to substitute the financial data. The presentations created a shared experience among the members of the IT committee and gave a common reference point to their discussions, as they explained:

*“During the presentations you get the impression that okay this person has his shop under control and what he says is probably something I should trust as a manager” (COO). “...based on our knowledge and what we heard during the presentation, and obviously the people also talked in the breaks and said is this important or is this not important” (IT portfolio manager)*

The other two tactics of substituting and interpreting financial data with judgments are not very common in this level compared to PG. In this section we presented the tactics through which managers reach decisions in the prioritization process. We discuss our findings in the following section.

## **6 Discussion and conclusion**

In our study we investigated an organization which tries to formally structure the IT project prioritization process in both the PG and the IT committee levels of the governance structure by identifying and constructing a set of objective criteria or technologies of rationalities (March 2006) and institutionalizing the collection of evidence for these criteria, i.e., financial data. While in many cases those elements support and define the prioritization task, they do not accomplish the goal of reaching a decision in practice. A summary of the findings is presented in Table 2.

	<b>PG Level</b>	<b>IT committee level</b>
<b>Process and project characteristic</b>	Lack of transparency of the overall process Lack of overview of project interdependencies Technical complexity of the IT projects Inaccurate cost calculation Unreliable benefit calculation Lack of benefit follow up process	Lack of transparency of the overall process Lack of overview of project interdependencies Lack of benefit follow-up process Distrust towards the cost and benefit calculations Incommensurability of projects
<b>Tactics</b>	Supplementing with Networks evidence Substituting evidence Sponsors Interpreting evidence Expertise Re-framing evidence	Supplementing with Networks evidence Substituting evidence Sponsors Expertise Chairmen Presentation

Table 2. Summary of findings

The projects can be quantified only partly, revealing an incommensurability problem (Espeland & Stevens 1998, Karpik 2010) not only between projects but also between portfolios of projects. This characteristic makes the IT projects non-comparable entities. This, in turn, undermines the evidence provided by the formal process, which appears incomplete and unreliable. While there is some evidence available to the decision makers, this evidence is mainly weak. The intangible benefits which highlight the problem of incommensurability, the project complexity which increases the perceived uncertainty of a project's outcome, as well as the project interdependencies which make it difficult to separate specific dimensions/characteristics of the project and compare them, impede the collection and use of evidence and domain expertise for analytical thinking, thereby make space for the use of alternative sources of knowledge in the decision process, what Karpik (2010) names judgment devices.

The incompleteness of evidence about the projects leads the decision-makers to turn to the use of judgment in the IT prioritization process. The managers employ mechanisms to collect information and shape their judgment, especially before the prioritization meetings take place, such as personal networks to assess the accuracy of data provided dialogue and sponsoring. According to Karpic (2010), we view these mechanisms as personal judgment devices which are associated with private knowledge, expertise and interpersonal trust.

Based on our findings we depict four tactics used by the decision maker while interacting with evidence in the form of financial data and judgment devices namely: supplementing evidence (or financial data) with judgment, substituting evidence with judgment and interpreting or translating evidence based on one's judgment.

These tactics are used in different frequencies in the two levels of the governance structure. It seems that in the PG, decision makers raise serious concerns about the financial data provided, which they interpret based on their experience and personal knowledge, and sometimes substitute financial data with their personal knowledge. The decision makers utilize supplementary technologies to legitimize their judgments and sometimes attempt to position their judgment as evidence to be used in the decision process. Moreover, based on their judgment they attempt to re-calculate financial data in order to present them as more convincing to the IT Committee meeting. The managers in PG seem to be more creative in their interactions with evidence. They are more strategic and less objective in their effort to have their prioritization list accepted. Since they are close to the primary source of information both in the form of evidence and personal knowledge for each project, they have a wide repertoire of tactics to support the projects they approve of while raising doubts to the projects they don't support. The substitution of "weak" evidence from personal knowledge and judgment also underlines the decision makers' doubts about the evidence.

Managers in the IT Committee do not have direct access to the source of information used to provide evidence and shape private knowledge about each project, but they need to have a holistic view to reach a final decision. As such, decision makers primarily used the tactics of supplementing and substituting the financial data with other inputs from networks, sponsors, experts, sponsoring and the presentation activity. These inputs equipped them with knowledge that shaped their judgment and allowed them to reach a decision. They show trust on the respective experts. The decision makers use judgment devices in order to

obtain a holistic perspective which will enable them to better understand the interdependencies and reduce the concern of projects' incommensurability in order to make their final decision. Their practice can be understood as pragmatic restraint, a form of deliberate inattention to the problems with estimating benefits. If one of the managers starts to question or even deconstruct the evidence for a project he or she dislikes, the other managers might do the same to projects of their distaste. Thus, it appears that it is in everyone's interest to show trust in the experts and not to debate the provided evidence.

Our findings contribute to the academic discussion about the use of evidence in the prioritization process. Recently, Kester et al. (2011) claimed that three different decision making processes are simultaneously present in prioritization process. Their approach allows researchers to account for the interplay of the different decision approaches in the prioritization process. However, in their study, Kester et al. (2011) do not clarify how the interactions between the different approaches unfold and how decision makers make room for one or the other approaches to prevail. Our focus on judgment devices and the interplay between these devices and evidence (objective) devices provides an in depth understanding of the mechanisms that are used in IT project prioritization processes by decision makers in order to reach prioritization decisions. The value of judgment devices becomes clear, both for researchers and managers, as soon as they better understand which devices are used, or not, in different contexts, and how they influence decision making. This study provided some initial insights on how judgment devices are used in an evidence-dominated domain.

This study contributes to understanding the scope of evidence-based management in the project prioritization process. We investigated how managers use evidence in IT project prioritization. Our findings highlight the interplay between evidence and judgment when reaching a decision about IT investments. The intangible properties of IT projects, which are difficult to measure and compare, raise challenges for the effectiveness of evidence-based practices. We find the scope of evidence-based practices to be confined in decisions that involve highly uncertain outcomes which are also characterised by incommensurability. These characteristics of IT projects drive decision makers to treat projects as non-comparable entities and as such they employ judgment devices that assist them in shaping their judgment about the projects and their importance. When project are treated as non-comparable the financial methods are not sufficient by themselves since they have the opposite result when applied to projects because they reduce projects to comparable numbers.

We also provide indications in line with Briner et al. (2009) suggesting that evidence-based management is more than scientific evidence and domain knowledge applied in practice. In particular, we do so by investigating how managers reach a decision in IT project prioritization where evidence is not enough and judgment devices come into play. During decision making evidence is not unimportant, even if it does not determine the outcome of the decision; it gains saliency because it becomes a central focus of discussion, reflection, and negotiation. In this sense, evidence does not close the dialogue, but starts and directs the dialogue prior to the decision.

Our findings should be interpreted with caution since they are based in a single yet longitudinal case study, which allowed for in-depth understanding of the process. However, we cannot claim that the results are directly transferrable to other organizations. Further research should be conducted in different contexts, e.g. sectors and organizations, to investigate the applicability of the judgment devices and the tactics identified in this study.

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