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## **IT Portfolio Management**

*Control Problems in a Public Organization*

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*Published in:*

Proceedings of the Transforming Government Workshop 2012

*Publication date:*  
2012

*Document Version*  
Early version, also known as pre-print

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*

Hansen, L. K., & Kræmmergaard, P. (2012). IT Portfolio Management: Control Problems in a Public Organization. In *Proceedings of the Transforming Government Workshop 2012*  
[http://www.iseing.org/tgovwebsite/tGovWorkshop2012/CRC2012/CRC%204/t-Gov\\_Lars%20Kristian%20Hansen.pdf](http://www.iseing.org/tgovwebsite/tGovWorkshop2012/CRC2012/CRC%204/t-Gov_Lars%20Kristian%20Hansen.pdf)

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# IT PROJECT PORTFOLIO MANAGEMENT: CONTROL PROBLEMS IN A PUBLIC ORGANIZATION

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## Abstract:

*As public organizations increasingly rely on IT-enabled development to provide faster cycle times and better services, IT Project Portfolio Management (IT PPM) has become a high priority issue. This research adopts engaged scholarship to investigate IT PPM practices within a large local government. The investigation applies Control Theory to analyze rich data from the local government covering multiple levels of analysis and several units with quite diverse functions to address the following question of practical and theoretical relevance: how does a large public organization control IT PPM and what problems are caused by this control? By drawing on the theory's distinction between different modes of control five problems in control is identified: (1) weak accountability processes between the political and the administrative level, (2) weak accountability processes between director level and the IT executives, (3) IT projects established on incomplete information about internal recourses, (4) Lack of operational goals to hold IT projects accountable, (5) No account of actual IT project costs. These results may be used to inform further research into IT PPM and to help managers improve IT PPM practices in public organizations in their effort of increase the level of e-Government.*

*Keywords: IT Project Portfolio Management, eGovernment, IT Management, Control theory*

## 1 INTRODUCTION

Due to the financial crisis, citizens increased expectations to public service, lack of labor cursed by fewer people of working age, must available resources must be better utilized, and the potential of digitalization of the public sector is considered as great (Regeringen/KL/ Danske Regioner 2011). Compared to other countries, the Danish public sector has been successful in taking advances of the possibilities offered by IT, and the Danish population' digital-competences is regarded as being on a high level (Regeringen/KL/ Danske Regioner 2011). But realizing, what is defined as, the greatest digital leap thus far (Regeringen/KL/ Danske Regioner 2011), the Danish local governments face major challenges, because they have the assignment to realize this digital-potential in practice.

One of the challenges that they are facing, are related to new IT Project Portfolio Management (IT PPM) practices – to improve their management of their vast amount of e-government initiatives. Danish local governments need new IT PPM practices, because exploitations and exploration of IT is considered as an important mean to cope with of urgent demands face by Danish municipalities (Pedersen and Hansen 2009). As a result, IT PPM has become a top executive issue. In managing IT PPM Control plays an important role (Kirsch, 1997). Control theory owns its legacy to Ouchi (1979) and Eisenhardt (1985) who developed this widely recognized theory. Control theory has proven useful to describe the mechanisms of managing complex tasks in organizations and has been adopted by

Information Systems (IS) to investigate: control of IS projects (Kirsch 1997); control of outsourced IS projects (Choudhury and Sabherwal, 2003); control of virtual IS development teams (Piccoli and Ives 2003); control of IS development projects in a global contexts (Kirsch, 2004); control of IS off-shoring (Dibbern et. al. 2008; Rai 2009); control of geographically distributed IS projects (Persson et. al. 2009); control of client management regarding the IS vendors (Rustagi et. al. 2008). However, according to our knowledge no prior IS research has investigated control-mechanisms in IT PPM in local government organizations. Thus, this paper addresses the following question: *how does a local government organization control IT PPM and what problems are caused by this control?*

To answer the research question an in-depth case-study has been conducted in a Danish local Government named Newport. Access to this organization was made possible by being a part of the DISIMIT-project<sup>1</sup>, which involves 11 Danish Local governments, two consultancy firms, and a team of 15 researchers. In the spring 2009, the DISIMIT-project conducted an investigation to identify IT management problems in the involved organization's effort to raise their eGovernment maturity. Three of the identified problems are defined as key problems and served as reference points in a collaborative development of applicable solutions. One of the before mentioned key problems was IT PPM (Kræmmergaard et. al 2009), and further collaboration with the Local government of Newport, seemed promising, because this organization aimed to improve its IT PPM practices. Due to the practical relevance and the opportunity to engage in practice, we decided to investigate Newport's IT PPM practices.

We adopts Engaged Scholarship (Van de Ven 2007) as our overall research methodology. This is due to it's ability to produce contributions relevant for practice as well as for research. During the period from November 2010 to January 2012 the following data collection activities was conducted in Newport: 28 interviews, 4 observations studies, and one workshop, which provided data from all hierarchal levels and several units with quite diverse functions.

This research aims to provide the following contributors. First and foremost, the research's main contribution is to provide insights useful for practitioners aiming to improve their IT PPM practices. This is done by describing how IT control is conducted and what problems the applied uses of control courses. Second, the IT PM literature benefits from more knowledge about the specific topic defined as IT PPM, which only scare research has addressed (Bonham 2005; De Reyck et. al. 2005). Third, the IT PM- as well as the PPM literature benefit from more empirical grounded about IT PPM. Following section discusses how Control Theory as formulated by Kirsch (1997) is used to address the three mentioned gaps.

The paper is structured as follows: in the next chapter, chapter 2 provides a short introduction to the background literature regarding IT PPM. Chapter 3 provides a presentation of the paper's theoretical framing. Thereafter, chapter 4 provides a brief presentation of the case, and chapter 5 presents the findings of the analysis. Finally, Chapter 6 presents the conclusion remarks below here implication for research and practice.

## 2 BACKGROUND LITERTURE

Following brief introduction to what is written about IT PPM has the purpose to address how the research addresses a gab in the IS literature and to show how two strames of literature contribute to our research, a stream of literture we defined as Project Portfolio Management, and an Steam of literature we defines as IT Portfolio Mangement (IT PM), and the follwong provides an brief disription

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<sup>1</sup> Digital Service Integration through effective Management of IT in Danish Municipalities

### 2.1.1 Literature on PPM

Kumar et al. (2008) emphasize that literature in New Product Development (NPD), Research and Development (R&D), and Project Management (PM) Kumar et. al (2008) should be taken in consideration when discussion portfolio management. This literature can be defined as Project Portfolio Management (PPM) and is about: *Management of a group of projects carried out under the sponsorship and/or management of a particular organization*. The PPM literature has a strong emphasis on development of models providing guidelines for PPM in practice, vastly based upon theoretical- or experienced-based arguments (e.g.: Archer and Ghasemzadeh 1999, Kendall and Rollings 2005, Morris & Pinto, 2007). The PPM literature offers a rich amount of techniques and frameworks useful in practice and research. But despite the richness of the PPM literature when it comes to theoretical grounded research, calls are made for more empirical grounded PPM research, and only few contributions investigate how real life organizations conduct PPM and what problems they face (Blichfeldt and Eskerod 2008).

### 2.1.2 Literature on IT PM

IT PM is according Kumar et. al. (2008) defined as management of interrelated portfolios of IT applications, IT infrastructure and IT projects IT PM as *a continuous process to manage IT project, application, and infrastructure assets and their interdependencies, in order to maximize portfolio benefits, minimize risk and cost, and ensure alignment with organizational strategy over the long run*. (Kumar et. al. 2008). Notwithstanding, IT PM's prevalence in practice (Weill & Aral, 2006) the discipline is regarded as less mature compared to portfolio management in similar fields (Kumar et. al. 2008). IT PM owes its legacy from financial investments where the portfolio perspective is used to determine the most the optimal mix of stocks or bonds in companies' investments (Fitzpatrick, 2005). In the early-eighties the portfolio perspective entered IS (McFarlan 1981) and the literature in the early period mainly focused on development of models and tools to support optimal portfolio decisions (e.g. Mitri 1999; Ghasemzadeh and Acher 2000; Stmelos and Angelis 2001; Dickinson et. al. 2001; Loch and Kavadias 2002; Stummer and Heidenberger 2003; Bardhan and Sougstad 2004). Notwithstanding, the comprehensive amount of sophisticated models offered by the literature, research showed that IT PM often were difficult to do and implement in practice (Jeffery and Leviveld 2004, Singh et. al 2009). In recent years, IT PM research has expanded its focus, from its narrow focus upon how the right decisions is taken, to focus on why it is difficult to coordinate organizations' IT portfolio decisions and concrete IT activities (Fonstad and Robertson 2006, Weill and Aral 2006, Weill and Ross 2009). Despite the recent attention upon these organizational aspects in IT PM, there is call for more research putting light upon mechanism linking IT projects and organizational actors (Fonstad and Robertson 2006). On this background, following research question addresses a research gap in the IT PM literature and in the PPM literature: *how does a local government organization control IT PPM and what problems are caused by this control?*."

## 3 THEORETICAL FRAME

Control Theory has proven useful to describe the mechanisms of managing complex tasks in organizations and has been adopted by IS research to investigate: control of IS projects (Kirsch 1997); control of outsourced IS projects (Choudhury and Sabherwal 2003); control of virtual IS development teams (Piccoli and Ives, 21 2003); control of IS development projects in a global contexts (Kirsch 2004); control of IS off-shoring (Dibbern et. at 2008; Rai, 2009); control of geographically distributed IS projects performing risk management (Persson et al, 2009); control of IS vendors (Rustagi et. al 2008). Control Theory is based on the premise that the controller and the controllee have different interests. These different interests can according to control theory be overcome if a controller brings control in effect to manage the controllee (Tiwana and Keil 2009). We follow Kirsch (1997) and applies an broad definition of control by defining control as "*all attempts to ensure that individuals in organizations act in a way that is consistent with organizational goals and objectives*" (Kirsch 1997). Control can be distinguished between formal and informal modes of control. Formal modes of control are defined as Behavior control and Outcome control. Behavior control consists of articulated roles and procedures and rewards based upon those rules. Outcome control is mechanisms for assigning rewards based on articulated goals and outcomes. The informal modes of control are carried out by the

control modes labeled as Clan control and self control. Clan control are the mechanisms of a group sharing common values, beliefs, problems, and these mechanisms work through activities as hiring and training of staff, socialization etc. Self control are about individually defined goals and can be carried through the mechanisms of individual empowerment, self management, self set goals, etc. (Kirsch 1997)

Control mode	Key characteristics	Antecedents conditions	Examples of mechanisms
Behavior	Rules and procedures. Articulated rewards based on following rules & producers.	Knowledge of appropriate behaviors, behavior is observable	Job descriptions
Outcome	Outcomes and goals articulated. Rewards based on producing outcomes & goals.	Outcome measurability	Define target
Clan	Common values, beliefs & problem solving philosophy. Identification & reinforcement of acceptable behaviors.	Appropriate behavior. Unknown outcomes. Not measurable.	Socializations
Self	Individually defined task goals or producers. Individual monitoring, rewards partly based on the individual's self control and skills.	Complex or non-routine task. Performance evaluation ambiguity. Lack of required rules or procedures. Desire to exercise self control. Individual ability.	Self-set goals

Table 1. Four modes of control adopted from Kirsch (1997)

## 4 METHODOLOGY

This research adopts the principles from Engaged Scholarship (Van de Ven 2007) and applies a participative form of research including the views of key stakeholders in the effort to understand a complex problem (Van de Ven 2007). We follow the argument that Engaged Scholarship potentially provides knowledge that is more insightful than if researchers work detached from the empirical settings (Van de Ven 2007).

### 4.1 Research Design

As we investigate how control is conducted and what problems this courses, we design our research as a case study (Yin 2009). The unit of analysis is the organization's IT portfolio management level, and we define as suggested by Van de Ven (2007) our levels of observation(s), which are following three levels: (1) control between political organizations and administration organization, (2) control between directors and IT executives, and (3) Control between IT executives and IT projects. To produce enough data to provide empirical evidence and to capture the variation in the case as suggested by Yin (2009), we collect data from all the organization's (seven) units and include data from various hierarchical levels.

### 4.2 Data Collection

Our data was collected between November 2010 and Marts 2012 via 29 interviews, review of documents, and four observation studies. We interviewed eight IT project managers, six IT executives, one business executive, and three vice directors. During the interviews (and re-interviews), we used mainly open ended questions informed by literature regarding Control Theory (Kirsch 1997) and Work Design Theory (Sinha and Van de Ven 2005). The review of documents consisted of documents expected to put light on the control mechanisms between actors involved in IT PPM. These documents consisted of: IT project status rapports, IT budgets, minutes, process descriptions, documents for IT portfolio management. The observations studies were intended to be conducted as direct observation where as a passive observataor followed the meetings the organization's IT executives. But this

showed to be impossible because we were asked questions and involved in the meetings discussions. To increase reliability in data collection the interviews were recorded in the extent it was possible. But in some cases would recording have a negative impact on the interview, because respondents would be reluctant to provide relevant information, e.g. some of the respondents asked directly not to record the interview. In these interviews and in the observations studies extensive field notes were taken. Furthermore, the 11 most significant interviews were transcribed.

### 4.3 Analysis

Our analysis strategy was designed to answer a research question containing two parts, *how does a large public organization control IT PPM, and what problems are caused by this control*. The answer how control was conducted a matrix for each of the three levels of observation was build displaying the identified mechanisms. Mechanisms were classified by using a two step process as suggested by Kirsch (1997). First appropriate behavior was determined based on normative guidelines from the IT PPM literature. Second, the controlee's behavior or outcome was evaluated by the use of table 1. To answer what problems the organization's control mechanisms course, we was inspired by Engaged Scholarship's dual criterion to determining the relevance of identified problems. This means that identified problems should be defined as from a theoretical perspective and as problematic from a practical perspective to be defined as a relevant problem. The first mention is done by justifying the identified problems by normative guidelines from the IT PPM literature. The practical relevance was tested by presenting your finding to the host organization, and based on the organization's feedback we modified our results. In terms of generalization of our result, we follow Yin (2009) arguing that generalization can be made on the background of a single case, by utilizing the rationale from *representative/typical cases*. Such studies capture the features of every day situations in IT PPM and knowledge regarding a typical local Danish local government is provided. This knowledge can be utilized by similar local governments.

## 5 CASE PRESENTATION

The local government of Newport services a population of 200.000 citizens and Figure 1 below gives a brief overview of the organizational structures. The organization's highest authority is the political level. This level consists of Town Council governing all seven units, and seven committees are having the day-to-day responsibility of each of the seven units. The left most unit is the Central Unit governed by the "Magistrat", where the Mayor is the chairman. As the dotted red lines indicate have the Central Unit and the Magistrat the responsibility of coordinating between units. Each of the reaming seven units has different areas of responsibility including management of; roads, parks, childcare, eldercare, unemployment benefits, social welfare, public schools, culture events, libraries, utilities etc.. The administrative level is a mirror of organization meaning that this is similar divided in seven units, where each unit includes between 200 and 5000 employers. Data shows that executives rank in the hierarchical levels is defined by an number, where level 1 executive are the highest level, level 2 executives is the second highest ranked executives and so forth.

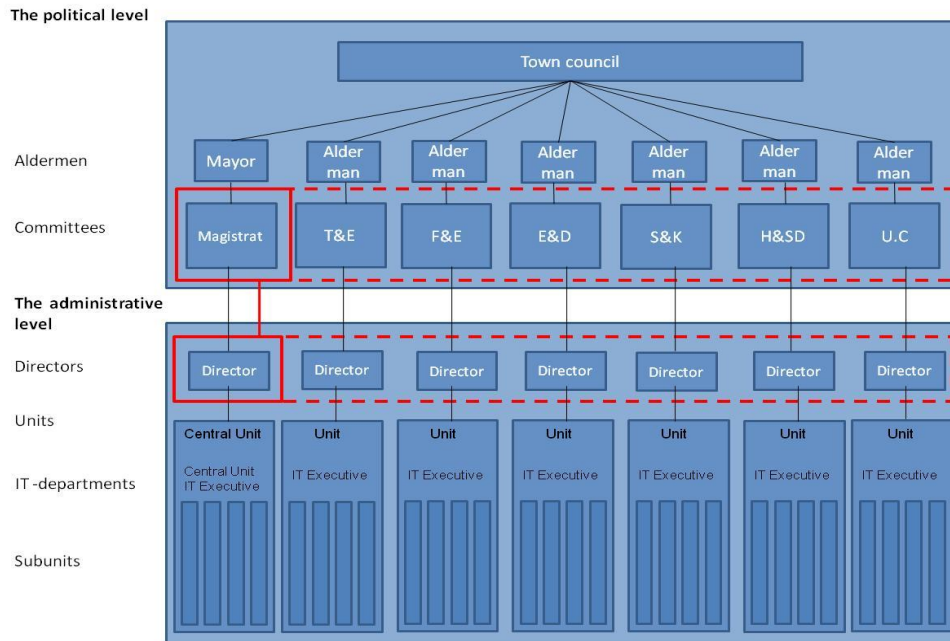


Figure 1. Local government of Newport

## 6 FINDINGS

By analyzing data four hierarchical levels is found especially important in IT PPM, because these levels holds the main authority, knowledge and resources in IT PPM<sup>2</sup>. This provides three hierarchal relations: (1) the relation between the political and the administrative organization, (2) the relation between the director level and IT executives, and (3) the relation between IT executives and IT projects. As described, control is defined by the following four modes: behavior control, outcome control, clan control, and self control. On this background it is analyzed where lack of control mechanisms constitutes a problems. Figure 2 below displays the structure of the following analysis.

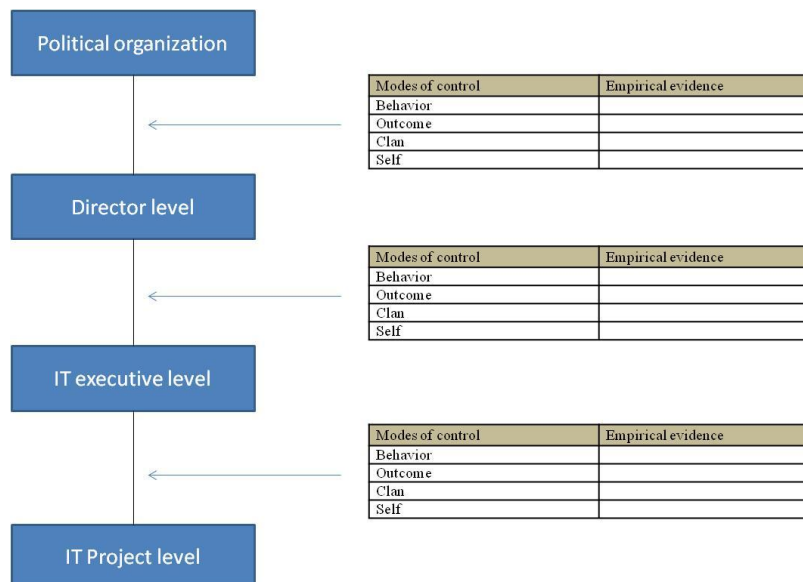


Figure 2. Control in three hierarchal relations

## 6.1 Control mechanisms between the political and the administrative organization

### 6.1.1 Behavior control

The relation between the political organization and the administrative organization is regulated by a comprehensive amount of laws, formal rules, and imperatives of an objective and impartial administrative organization, and the most important event is Town Council's yearly negotiation and fixation of next year's of budgets. The budget outlines expenses held by the organization, which is summed up in items and in units. Despite the budget contains detailed information regarding expenses to schools or roads etc. most IT expenses is included in the broad item defined as "administration", which includes a range of other items than IT. It seems likely that behavior control not is in effect in this relation, certainly not in the sense prescribed by the IT PPM literature, e.g. by having established specific rules for management of IT expenses.

### 6.1.2 Outcome control

Use of outcome control mechanisms regarding IT expenses in the yearly budget is scarce. Only few outcome measures regarding IT are articulated in the budget. The few mechanisms that have been identified involves control of the Central Unit. Furthermore, it difficult to get outcome control mechanisms in effect between the political and administrative organization, in terms of rewarding the administrative organization for reaching specified outcome targets regarding IT. Therefore, resources are taken in the first part of IT projects, otherwise the saving will, according to a top executive, not be materialize. But, from a Control Theory perspective this procedure has the downside that the controlee is not rewarded for reaching the outcome target (Kirsch 1997), which is to create more efficient process. Instead the controlee is rewarded by conducting cost cut which not necessary is appropriate.

### 6.1.3 Clan control

The daily face-to-face interaction controlling of the administrative organization's daily operations are vastly done by the aldermen, and data shows that they put a lot of trust on the effectiveness of clan control. This is due to different factors. Newport has in contrast to most other local governments, a system where the aldermen are fulltime employed and the aldermen are physically placed in administrative organization, often near the director of the unit. Thus, from a Control Theory perspective, the aldermen are in a position where long experience and long terms relationships making them able to internalize values and belief in the administrative organization's executives (Kirsch 1997). Some clan control mechanisms have proven to be in effect regarding management of IT, but the aldermen has a range of other issues that demands their attention. Therefore, use of clan control in this relation has the drawback that this is time-consuming (Ouchi 1979) and occupies scarce time resources of an organizational level occupied with political issues.

### 6.1.4 Self control

Self-control is about values and objectives held by individuals (Kirsch 1997), which in this case is values and objectives held by the levels of directors and initiatives to manage and improve IT PPM. Data shows that the values and objectives of the director level are an important precondition for development of IT PPM. The role of the director level regarding IT PPM is reactive, meaning that they may approve IT PPM initiatives, but is not taking the role of formulating new goals or improving performance for IT PPM. Data shows that the director level has values and beliefs that in some issues are in conflicting with key practices in IT PPM, such as values supporting organizational structure with great autonomy of the units which conflicts with the notion of a centralized overview and control in the IT PPM literature. On the other hand, data shows that the director level sees some potential benefits by centralization of management of IT.



Modes of control	Mechanisms
Behavior	Formal procedures for communication between the political organization and the administrative organization.
Outcome	The yearly budgets approved by the Town Council has some formal goals for IT management
Clan	Daily contact between the aldermen and the administrative organization
Self	Some incitement to keep an silo-divided organizational structure Acknowledgement among the director level that some IT PPM practices could be beneficial.

Table 2. *Modes and mechanisms of control between the political organization and the administrative organization*

#### 6.1.5 *The extent of control in effect*

In the relation between the political and the administrative organization only few formal control mechanisms have been identified. Behavior control is vastly conducted through general laws, rules and procedures and minor formal mechanisms reporting about the organization's IT investments have been found. In contrast, wide uses of informal control was identified, vastly in form of clan control mechanisms performed by the aldermen's day-to-day contact with the administrative organization. But data shows that informal mechanisms in some aspects are unsuitable, because bringing these control mechanisms in effect take a lot of time-resources from the political organization. Self control mechanisms, which are initiatives and values held by the director level, are in some ways conflicting with IT PPM. From a control theory perspective, it is considered as problematic that accountability processes in IT PPM between the political and administrative organization is vastly based upon clan control mechanisms. Evaluation of performance in IT PPM is difficult for the political organization. This is due to the political organization's skills and knowledge regarding IT PPM does not make them able to conduct an evaluation based on informal information. From a control theory perspective, use of outcome control can reduce the costs of evaluating performance, because this measure potential reduces complexity (Ouchi 1979). Data shows that the organization not utilizes the potential of outcome measures, for example where IT PPM performance can be expressed by prices or scores.

## 6.2 **Control mechanisms between the director level and the IT executives**

### 6.2.1 *Behaviour control*

This relation's most significant behavior control mechanisms are related to IT strategies and the organization's IT Groups. In some units the IT strategy serves as an agenda for on-going evaluation of the unit's IT PPM, and provides a formalized structure for evaluation. For example, in some unit's their IT group draws up a report on a yearly basis, which are sent to the director level's approval. Mostly the unit's IT Group's purpose, roles, and mechanisms are described in a remit, but there was large variation between units regarding how much activity the IT Groups conduct and the amount of formalized information they have. Thus, a great deal the unit's IT PPM activities were conducted outside the control of the unit's respective IT group. A significant behavior control mechanism dealing with issues not treated by the IT groups is informal meetings between the unit's vice director and the IT executive, typically held twice a month. In most units the vice director have the day to day responsibility of the unit's budget, finances, internal operations, and below here the unit's IT. Data shows that most IT PPM; is out-delegated to the unit's IT executives, is based on not articulated guidelines, and not uses formalized criteria to evaluate the IT executives' performance. By relying on informal control and dealing with problems *when* they emerge, the level of directors is precluded from some of the key behavior control mechanisms suggested by the IT PPM literature, e.g. matrixes showing status of status parameters in IT PPM making the able to act proactively. From a control theory perspective, it would be beneficial to bring behavior control mechanisms in effect by using explicit rules to define how content and status of IT PPM is presented to the director level. Data shows that lack of behavior control mechanisms is problematic because the IT executives have minor incitement to provide an intuitive and standardized overview of IT PPM. The director level above simply doesn't ask for this or appreciate it. In sum, from a control theory perspective, some behavior

mechanisms are conducted by the unit's IT Groups. But minor behavior control mechanisms between the vice directors and the IT executives can be identified, this despite the IT executives mostly have the vice director as their closest superior.

#### 6.2.2 Outcome control

The IT PPM literature suggests an range of goals for IT PPM suitable for performing outcome control, between the director level and the IT executives, e.g.: measuring the time used to complete projects (Kendall and Rollins 2003, Balaji 2011, Mitri 2011), measuring the amount of incidents in projects (De Reyck et. al. 2005), measuring the amount of resources used on maintaining IT and IT enabled development (Weill and Ross 2009), and measuring the value created from the IT portfolio (Jeffery and Leviveld 2004). But minor outcome control mechanisms as suggested by the IT PPM literature are identified in the case. For example, when the vice directors are asked to specify the criteria to evaluate how their IT executive is doing a good job, they do not use formalized criteria. Instead, the initiative to establish outcome control in IT PPM comes from the IT executives who are motivated by making their efforts more visible. Some of the IT executives explain that it is difficult to formalize IT PPM in a way relevant to the level of directors. It is found that the director level does not see major restraints in terms of starting new IT projects. However, data shows difference between the director level's notion of available resources and the lower levels notion of available resources. Some of the IT executive explains that one of the major challenges in IT PPM is that IT projects draws on the same specialists and key persons. Some of the IT executives have tried to create formalized measures of available and used resources in IT PPM, but data shows that this form of measurement is in contrast with the organization's culture.

#### 6.2.3 Clan control

There is great difference between the units in the amount of used clan control mechanisms they use between the directors and the IT executive. In one unit the IT executive does not have informal contact with the director level and formal control is neither in effect. Some IT executives experience this as problematic because the business part of the unit has too great expectations towards available resources of the IT department. This example serves to some extent as a contrast to the general picture, where the vice directors effect clan control via daily informal contact with the unit's IT executive. In some units the vice directors and the IT executives are placed in the neighboring offices. Data describes their frequent informal encounters and how long term working relationships evolve shared beliefs and goals. Data shows a great range of clan control mechanisms in effect and both IT executives and the director level consider these mechanisms as being efficient and crucial. From a control theory perspective, trust and informal relations can facilitate complex coordination in a non-bureaucratic way (Ouchi 1979) and data shows that this is the case in the relation between the IT executives and the director level. On the other hand, the control theory perspective emphasizes that clan control demands constant interaction between the controller and contolee, and data showed that this not is the case in all units.

#### 6.2.4 Self control

Self control in this relation is understood as self-monitored, self-rewarding, self-sanctioned mechanisms that IT executives perform on an individual level to conduct or improve IT PPM. As shown in the above, the general picture is that IT executives are trusted and have large autonomy in IT PPM practices, and there are few formal and clan control mechanisms encouraging IT executive to further develop of IT PPM. Various data shows that the IT executives have values and established self-sanctions mechanisms to improve IT PPM. The weakness of the self established initiatives by the IT executives is that the director level has to support these initiatives to bring them in full effect. An IT executive states about the IT executives' self-driven initiative to improve IT PPM, "*There is a lot of good intentions, a lot of good talk, a lot of rhetoric, a lot of good goals, but IT PPM without the support of the level of directors nothing happens*".

Modes of control	Mechanisms
Behavior	IT group meetings with formal procedures, routines and remits
Outcome	Only few weak mechanisms identified
Clan	Informal meeting between vice directors and the IT executives Shared objectives and beliefs gained through long term working relationship
Self	IT executive's self criticism drives improvement of IT PPM

Table 3. Modes and mechanisms of control between director level and IT executives

#### 6.2.5 The extent of control in effects

The identified behavior control mechanisms are mainly formal procedures conducted in the unit's IT Groups and seem to be in effect in units where IT Groups are used intensely and frequently. In general, only few formal control mechanisms are identified to support the director level's evaluation of IT PPM. Data shows that the director level's reliance on formal control mechanisms has some drawbacks. The used informal control mechanisms have as low information-carrying-ability, because the director level has minor knowledge about IT PPM and can not evaluate IT PPM on the background of complex informal information they receive. Data shows that the director level's evaluation of IT PPM could be more informed by adding formal mechanisms, in terms of quantified performance measures. Namely, it has been identified as problematic in various units that IT projects are established on incomplete information about available internal resources, which temp directors to start too many IT projects. One the other hand, the organization's extensive use of informal control has some advances and data shows that clan control mechanisms in some issues provide a non-bureaucratic coordination of complex tasks. Finally, data shows that self-control mechanisms established by the IT executives are important drivers in IT PPM. But these initiatives carried by the IT executives self control mechanisms have the weakness that they have to be supported by the director level to come in effect.

### 6.3 Control mechanisms between IT executives and IT projects

#### 6.3.1 Behaviour control

The most significant behavior control mechanism is procedures related to the use of a document called the Project Agreement. This document is decided by the director level to be mandatory in all the organization's IT project. The document is intended to be developed in the initial phase of the IT project, which mostly is carried out by the IT project manager, the IT project-owner, and the involved unit's IT executive. The Project Agreement provides an range of formalize guidelines at the IT project management level such as; how the IT project is organized, how the risk analysis is conducted, how the communication plan is conducted, how a quality plan is used, how new ideas are logged, how experiences are stored etc. Evidence shows that there is some variation between units in terms of how much the Project Agreement is used, but most of the interviewed respondents intend to use the document in future IT projects.

#### 6.3.2 Outcome control

The Project Agreement is also used as a mean to establish outcome control mechanisms, because the document makes it mandatory to formalize the IT project's outcomes by specifying what concrete products are created by the IT project, and the goal or goals of the IT projects. But data shows there is great variation between IT projects in which degree these outcome control mechanisms are used. From a control theory perspective, this operationalization of goal and products gives a quantified foundation to evaluate and reward the effort of the participants. From the perceptive of Control Theory could these quantified measures be defined as an unambiguous criterion for defining success or not success (Ouchi 1979). The advance of quantified measures is that the controller's administrative overhead is minimized, because the controller does not need to know the IT Project in detail, but can evaluate on a simple measures of the IT projects performance (Ouchi 1979). As mentioned, this use of outcome control mechanisms to measure performance of the projects results are not used in most IT projects.

### 6.3.3 *Clan control*

The IT executives explain that they have day-to day contact with the IT project managers employed in their IT department, and most IT department have a frequency of meeting with informal talks regarding the units' ongoing IT projects. When problems occurs the IT executives gets more involved in the IT project, which according to some of the IT executives is an efficient control mechanism. Similar, the IT project managers explain that they also sees informal control as an important a mean in their work of controlling the IT projects. However, clan control mechanism can be difficult to bring in effect, when there is physical distance and organizational boundaries. Data shows that IT project team members in different units or subunits often have different goals and beliefs. One example shows how this is problematic in an IT project with the purpose to providing a new and standardized IT application across units. Some of the units are satisfied with the existing IT application and therefore less motivated to contribute to its development and funding. In this project is the IT project manager's extensive use of clan control not sufficient to advance the project.

### 6.3.4 *Self control*

Self control mechanism in this relation is defined as the IT project manager's use of self-set standards in IT project management. Data shows that some IT project managers use project management standards that go beyond the standards set by their superior (the unit's IT executive). Data shows that self control mechanisms have large impact on the organization's use of IT project methods. Evidence shows that IT project mangers in the same unit's use IT project methods very different and this is despite the IT project managers are subordinated by the same IT executive.

Modes of control	Mechanisms
Behavior	Use of the document "Project Agreement" formalizing procedures in project management
Outcome	Use of measurable goals in IT projects is often difficult
Clan	Use of informal pressure to provide internal resources in IT Projects
Self	Self set goals for standards by IT project managers

Table 4. *Modes and mechanisms of control between IT executives and IT projects*

### 6.3.5 *The extent of control in effect*

Behavior control between the IT executive and IT projects are specified by the document called the Project Agreement, which formalizes a range of the procedures in the organization's IT Projects. In terms of outcome control, it is often found difficult to operationalize IT project goals to measurable outcomes, because the outcome is spread across different units and subunits. Second, the IT project's outcomes can have low value to the organization, because some IT projects are imposed by laws or actors outside the unit. Third, lack of IT project manager's time force them to give some IT management practices a lower priority, and data shows that leaving out operationalized goal not is sanctioned by controllers. Clan control mechanisms are important means in the organization's IT project management, but when IT projects are going across boundaries of units or subunits, this mode of control mechanism is difficult to bring in effect. Self control, understood as the IT project managers self set goals regarding use of standards for IT project management, has shown to be in effect, and some IT project managers apply high standards in IT project management despite they not are rewarded for this effort. It is found problematic that there is minor use of outcome control mechanisms in the relation between IT executives and IT projects. This is because the control mechanisms in effect not provide a sufficient foundation for the evaluating the benefits of the unit's IT projects. Second, data shows only few mechanisms controlling use of internal resources in IT Projects. The organization has minor tradition for accounting and allocating resources via IT projects. Instead, resources are vastly allocated to units and subunit via yearly budgets. From a control theory perspective, it is problematic that as long as the ongoing operations are conducted at an acceptable level, and the budgets are kept, the units and subunit are not sanctioned or rewarded on the background of the amount of resources used on IT projects.

## 7 CONCLUSION

The following section outlines the problems in the three investigated hierarchical relations. This is done by highlighting the extent of control in effect at each level, and highlighting identified problems coursed by lack of control. Figure 3 below show five identified control problems and the relation they emerge from.

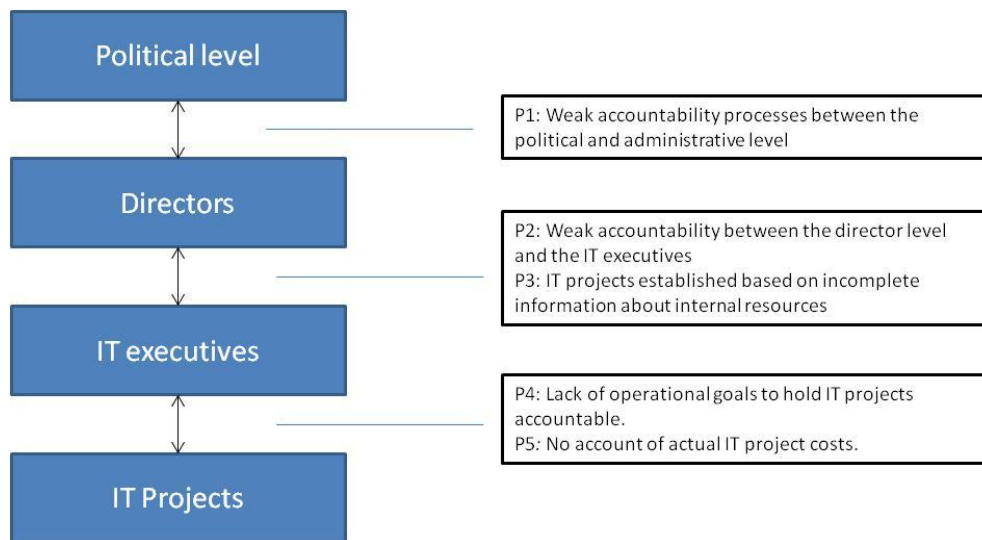


Figure 3. Five identified control problem.

### 7.1.1 Problems in the control between the Political and the administrative organization

It was found that this relation vastly relies upon behavior and clan control. Behavior control is exercised through bureaucratic procedures, organization rules, and laws determining appropriate behavior of the administrative organization. It is found that these formal control mechanisms are less in effect related to IT PPM. The most predominate form of control in this relation is the clan control conducted by the aldermen's daily involvement in the day-to-day operations. It is concluded that the political levels' use of clan control mechanisms are insufficient to control performance of IT PPM and are too time consuming. Thus, the first identified problem is defined as: *Weak accountability processes between the political and administrative level.*

### 7.1.2 Problems in control between directors and IT executives

Data shows that the relation between the vice director and the IT executive is important, because the vice director is responsible of the day-to-day operations of the organization. It is found that this relation mostly is based upon informal control. In some units is control of IT PPM successfully conducted by IT Groups, but support from high levels executives is essential to these IT groups' success, which in some units are lacking. On the background it is concluded that the second identified problem is *weak accountability between the director level and the IT executives.* Furthermore, lack of outcome control mechanisms in this relation means that the director level has in insufficient information to evaluate the amount of available of internal resources. This tempts the director level to start too many projects. Thus, the third problem is formulated as *IT projects established based on incomplete information about internal resources.*

### 7.1.3 Problems in control mechanisms between IT executives and IT projects

It is found that the organizations reliance on informal measures has the downside that it is difficult for stakeholders, not directly involved in IT projects, to evaluate in which degree IT project's goals are achieved. Thus, fourth problem is defined as: *Lack of operational goals to hold IT projects accountable.* Furthermore, data shows that evaluating the total cost of IT projects is difficult, because

a great deal of IT projects cost is based on internal resources. Thus, problem five is formulated as *No account of actual IT project costs*.

#### 7.1.4 Implications and limitations

Public executives may use these results to improve their management of e-Government projects. We find that a local government's reliance on informal control in IT PPM makes it difficult for stakeholders, not directly involved in IT PPM, to evaluate its performance. We suggested, based on Control theory, that more formal control mechanisms are added to the organizations informal mechanisms. These formal mechanisms must be adjusted to: task characteristics, role expectations, knowledge and skills of involved managers, executives and stakeholders (Kirsch 1997). In terms of implication research, this research contributes to the stream of IT PM literature, which calls for more empirical grounded PPM knowledge (Blichfeldt and Eskerod 2008), and the research contributes to the stream of IT PM literature, which calls for more knowledge regarding linkage mechanisms in IT PM (Fonstad and Robertson 2006). There are numerous limitations in our research. The local government that we investigated is governed by a "Magistrat", this is not uncommon, but most other Danish local government applies a different form of governance. This means that our results not can be generalized as typical or representative for Danish local governments. Furthermore, we found that control mechanisms not always could be isolated to one hierarchical relation. For example in problem 3, where we argue that *IT projects established based on incomplete information about internal resources* is an control problem between the directors and IT executives. This problem could also be considered as a problem between IT executives and IT projects, because these actors are involved in the the calculation of a IT project' feasibility. We encourage future research to development Control Theory by putting more light on how the interaction of multiple levels of control can be understood.

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