MANAGING COST ACCOUNTING IMPLEMENTATION THROUGH DISCOURSE

A SINGLE CASE STUDY OF PEC MODEL IMPLEMENTATION IN REGION HALLAND

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Abstract:

This paper examines accounting and organizational change process and its institutional background by conducting a case study of the implementation process of a simplified Time-Driven Activity-Based Costing system in a Swedish Healthcare Region. Using a framework adapted from Zbaracki (1998), separating reality and rhetoric along a process-view, the paper examines how institutional forces enter the implementation process and how the arising tensions are managed along the process. The paper finds that authoritative professional institutions, such as literature, shape the design of the costing system, the utilization of which is shaped by professional groups. In order to manage potential conflicts from professional groups, the management is found to handle their influence by translating the accounting language of the costing model into operationally understandable instructions and guidelines, maintaining the control of the process by utilizing the language of the medical professionals and emphasizing common values to create room for both professional logic and economic logic. These findings contribute to literature on healthcare accounting and implementation of costing models in complex organizations by demonstrating how the discourse related to the implementation process impacts the reality of the implemented model and its use. The findings also confirm the central role of top management commitment in leading the implementation process.

Keywords: Hospitals, Accounting and organizational change, Process analysis, Time-driven activity-based costing, Implementation of new system.

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1. Introduction

Continuing a long-running trend, the growth of healthcare costs is projected to outpace the economic growth in OECD countries (OECD, 2019). This has led governments and healthcare organizations to try and ensure sustainability of their funding. Since the 1980s, New Public Management (NPM) has attempted to solve the issue of public spending outpacing the growth of the economy (Hood, 1991), which has also led to a multitude of applications in the healthcare sector (see e.g. Cairney, 2002). Implementation of costing systems for improved cost control has been one of the solutions in the healthcare industry, with numerous examples of governmentally imposed, such as reference costing systems (see e.g. Northcott & Llewellyn, 2003), and business-driven costing systems, such as Activity-Based Costing (ABC), and Time-Driven Activity-Based Costing (TDABC) (Kaplan & Anderson, 2007). These developments show the healthcare industry is also subject to management fashions (Barley & Kunda, 1992), influencing managerial rhetoric and focusing it on improving the efficiency of resource allocation (see e.g. Kaplan & Porter, 2011).

There is a long line of accounting-based healthcare management fashions, stretching from NPM-inspired funding models based on diagnosis related groups (DRG), and attempts to align the costing models after them (Chapman, Kern, & Laguecir, 2014), to reference costing systems utilizing benchmarks to inspire mimicking of best-practices (Northcott & Llewellyn, 2003) and ABC (Ramsey, 1994). Motivated by Porter's (2010) value conception and the notion of value-based healthcare, TDABC systems have recently gained popularity, being implemented in many different hospital settings (Keel, Savage, Rafiq, & Mazzocato, 2017), thus presenting the latest trend in healthcare accounting. However, the implementation of new costing systems is not a straightforward task. The decision to implement a new system is accompanied by many considerations, such as cost, data management and commitment to change that have been seen as obstacles to implementation of ABC systems (Lawson, 2005). The process is also impacted by cultural acceptance and willingness for change, alongside more technical requirements (Shields & Young, 1989), as well as the presence of non-accountants whose involvement in the implementation process may reduce conflicts (Abernethy & Stoelwinder, 1995). The significance of different professionals has also been highlighted in recent TDABC research, where the involvement of medical staff has been highlighted as an important factor in successful implementation of such systems, alongside management commitment and sufficient data-systems to support the system (Campanale, Cinquini, & Tenucci, 2014). While there is a lot of research into the factors impacting the implementation of costing systems, the management of these pressures remains a gap in the literature.

The influence of professional groups, management fashions and regulatory frameworks can be conceived of institutional forces that shape the way organizations work (DiMaggio & Powell, 1983). Zbaracki (1998), studying how institutional pressures impact

management systems, has found that communication shapes the way those systems are conceived, sometimes developing overly optimistic views. The broader process of sense-making during implementation may also impact the results of organizational change, the results of which may vary from shallow formal systems that change little but appearance (Smith, 1982) to profound change in the organizational culture system, depending on the pathway of change (Laughlin, 1991).

Based on the above, this paper aims to shed light on the role of management functions in the implementation process of novel costing technologies in facilitating organizational change, more particularly focusing on the finance function, as their role is particularly pronounced in the context of costing systems. Hence, the paper aims to answer the research question:

How does the finance function manage the influence of professional groups in the implementation process of a costing system?

To examine this question, this paper will conduct a case study in Region Halland (RH), a Swedish Healthcare district which has implemented a new costing model called Patient Encounter Costing (PEC), a simplified version of TDABC that uses compilations of already existing care, human resource and financial information in attempt to improve the accuracy of the costing information (Slutzman, 2017). The influence of institutional influences is apparent in the Swedish healthcare sector, where management practices, including costing systems, are impacted by regulatory frameworks such as Swedish cost per patient (KPP, kostnad per patient) principles that set general guidelines for costing of activities in hospital care (SKR, 2015). Manifestations of NPM have also entered into the healthcare sector in Sweden with lean production methods (Trägårdh & Lindberg, 2004) and activity-based financing (Kastberg & Siverbo, 2007). In this context, this paper embarks on a review of the institutional pressures and their management in RH to provide more nuanced understanding of the pressures and their rhetorical management in the implementation process.

To conduct this investigation, the paper adopts a methodological approach arising from institutional theory. Theoretical framework adapted from Mark Zbaracki's (1998) research into how institutional forces shape management fashions, based on institutional theory, will be utilized, allowing the paper to examine not only the reality but also the rhetoric of the PEC model. The approach examines the social construction of PEC by separating the two perspectives along a process view of the implementation. This should allow for examination of how institutional pressures, such as regulatory framework, best-practice cases and the consideration of different professional logics shape the implementation process, and ultimately the form the costing model takes in practice. By doing this, the paper contributes to the healthcare accounting literature by highlighting the social construction of costing systems in the process of their implementation.

Particularly, the tensions during the implementation system, and how they are managed through rhetoric, and how that rhetoric shapes the system.

The paper will continue in section 2 with a review of the domain theory of healthcare accounting and costing methods, followed by an outline of the method theory of institutional theory and the adaption of a theoretical framework. Section 3 will outline the methods used for analysis. In section 4 the paper will then present the empirical findings, before analysis in section 5. Finally, in section 6, the findings will be discussed and set in the context of previous literature, before concluding the paper, discussing the limitations and proposing future research suggestions in section 7.

2. Literature Review

In this section the paper will review the literature on the domain and the method theory. The review will first cover, focusing first on healthcare accounting and costing, then shifting focus to the process of accounting change and its complications in complex organizations, particularly medical institutions. This review will help to theoretically contextualize this paper and help define the key research priorities for our case study. After domain theory, the method theory will be reviewed, building the theoretical basis for the research based on the previous literature.

After reviewing the previous literature, a theoretical framework will be drawn to create the lenses, through which the research question shall be addressed.

2.1. Domain theory

2.1.1. Accounting in Healthcare Management

The growth of healthcare costs has outpaced the economic growth in OECD countries, leading to increasing cost sustainability concerns as the costs are projected to outgrow the GDP even under increased cost control (OECD, 2019). This growth in healthcare spending has been fueled by a multitude of factors like ageing population and new technological advancements. More than ever, every tenth worker in the OECD countries is now employed in the health and social care sector. The increasing costs put a lot of pressure on governments, as well as individual healthcare organizations to adopt cost-control control measures. The ageing population and increased demands for quality care, and the increased cost-control pressures place the healthcare sector in a tight spot, where they are required to either add money into the system, or to improve efficiency to serve more people while controlling the cost increases, reflecting the one of the key tenets of NPM, the control of the growth of public sector spending (Hood, 1991). To enable these difficult efficiency and effectiveness improvements, many scholars and practitioners have turned to accounting and control technologies as a tool for reaching these goals. Better resource allocation and management could enable healthcare organizations to free up their precious resources, and to direct them where they yield most impact.

There are a multitude of complex goals in healthcare, such as the patient-focused goal of health outcome, as well as more financially driven goals, i.e. cost-control. These form the basis for the notion of value in healthcare (Porter, 2010) which generalizes the idea of measuring bang-for-the-buck of providing healthcare by conceptualizing value as health outcomes per the unit of money spent producing it. This implies that the value the healthcare organizations provide can be improved by either improving the health outcomes or by decreasing the cost of reaching those outcomes. Consequently, that means the two broad areas where performance measurement can provide most is in measuring

these two variables. There are numerous other objectives healthcare organizations have, such as the perceived quality of care, patient satisfaction, access to care, and equity in healthcare (Porter, 2010). However, these, Porter argues, do not factor into the value, even if they are otherwise important objectives to tackle. The concept of value, when applied to individual processes and procedures, can make it also possible to improve the performance of healthcare delivery by eliminating steps that don't add any value. However, the major problem is that only a very few providers today—clinics or hospitals—have valid measures of the outcomes they achieve or the costs they incur to treat individual patients for specific medical conditions. The uncertainty of cause effect relations which is a consequence of the fragmented way in which healthcare is delivered, with each provider entity responsible for only a component of the patient's complete care experience, increasing the difficulty of reaching valid outcome information.

The cost side of the function has seen many innovations over the years. Traditionally, the costs of providing healthcare have been measured at either department or unit level. When costs are measured at a unit level, based on cost centers, disaggregating the data to assess the value of healthcare becomes. This has led to implementation of accounting tools to measure the costs on more appropriate levels. One such innovation came from the sphere of NPM with the implementation of a prospective payment system (casemix funding) based on DRG, a calculative system used for reimbursement in many health systems, that based reimbursements hospitals would receive on the diagnostic groups of the patients cared. This has created an incentive for healthcare providers to align their objectives with the reimbursement they receive for certain DRGs, necessitating - sometimes even regulatorily - costing models to calculate the costs in relation to DRGs (Chapman et al., 2014). DRGs, despite their popularity, have been criticized for being inadequate for measuring the costs of complex diagnoses, such as chronic heart failure which can be classified under different DRGs (Chapman et al., 2014). Since the cost data is not available on a patient-level, measuring the value of healthcare remains a difficult task under costing systems aimed to match the DRG-based funding, and the soundness of the DRG costing has been questioned, particularly due to its ability to only capture 50% of the variation in actual healthcare costs (Abernethy, Chua, Grafton, & Mahama, 2006). Countries such as Germany and the Netherlands, however, are trying to implement a bottom-up approach based on activity-based costing (ABC) to match the DRG-funding more closely to actual patient-level costs (Chapman et al., 2014).

Activity-based funding (ABF) has also been done in Sweden, with results indicating increased productivity and decreased wait times, albeit without reducing the total costs (Kastberg & Siverbo, 2007). Kastberg and Siverbo found ABF to increase the financial consciousness but this did not lead to control over the total costs of healthcare, delegitimizing the model, despite many attempts to adjust the ABF through ceilings and discounts.

2.1.2. Costing in healthcare

In addition to its use in improving DRG-based funding systems, ABC has seen wider use in healthcare cost management, as it allows for more granular measurement of costs based on activities performed. A successful costing model should promote cost efficiency, allow for optimization of resource use, and highlight opportunities for continued improvement (Ramsey, 1994). Ramsey argues ABC fulfils these requirements and should thus be implemented at healthcare organizations. However, in a pair of US surveys in 1994 and 2004, few organizations had implemented such models, mostly citing cost concerns and difficulty of implementing new models (Lawson, 2005). Between the surveys, organizations became more worried about accounting systems' ability to account for costs of various activities, an objective ABC should be able to tackle. Despite wide-scale agreement that ABC could help organizations with these issues, the hurdle of implementation has slowed the willingness of organizations to implement these models and systems.

There are also critical remarks from practitioners (Demeere, Stouthuysen, & Roodhooft, 2009; Öker & Adigüzel, 2010) who argue that ABC is costly for costing complex activities, and thus unsuitable for highly variable activities, where every variation requires forming a new task for which the cost can be determined. In ABC costs are assigned into cost pools, which are then assigned to activities, and consequently products and services created by those activities (Campanale et al., 2014). This contrasts with an alternative costing model that has been gaining popularity recently (Keel et al., 2017), Time-Driven Activity-Based Costing (TDABC) (Kaplan & Anderson, 2007), where there is only one composite stage, forming the capacity cost that is then used to allocate the costs to activities based on the time spent using the resources, in effect moving the focus from activities to resources. Both models still have in common that they require mapping out the process of healthcare delivery to understand how the resources are used, but instead of using that information to form distinct activities that account for the variation in service delivery, as the ABC does, TDABC uses that mapping to calculate the capacity cost for using the healthcare personnel and other resources to deliver care, thus circumventing the need to create unique activities to account for all the variations in the process.

Unlike ABC, where costs are assigned from the cost pools onto the activities, TDABC allocates the costs onto the resources or capacity (Hoozée & Hansen, 2014), thus allowing for costing not only the used capacity, and used services, but also the unused capacity, by combining the capacity cost and the information on the use of resources (Kaplan et al., 2014). This means the cost of delivering a service in half the time and idling for an equal time reduces the TDABC cost of the task performed, while also underlining the cost of the idle time, i.e. the unused capacity. This brings out one of the advantages of TDABC, its ability to highlight and analyze the use and non-use of resources along the care journey, making it easier for TDABC cost information to be used as a basis for resource reallocation.

Comparing the costing errors between the two models shows that TDABC is more accurate than ABC when resources are more traceable to activities, ABC is more accurate than TDABC when activities are more traceable to products or both resources and activities are more traceable to activities and products, and if each type of traceability is equally likely, then ABC may be the more robust approach (Hoozée & Hansen, 2014). TDABC may work well in hospitals when one group works on tasks that are much different than another group. However, the model may face difficulties when one person performs tasks from multiple processes (such as nurse practitioners). In that setting, the wage cost of that person will have to be arbitrarily split across processes in order to determine capacity cost rates. The arbitrary nature of the allocation means that ABC may be a better model in those settings (Hoozée & Hansen, 2014).

There are large variations in the processes and staffing used by clinical organizations to perform the same procedure on comparable patients. Even within a single clinical organization, individual doctors may use different processes, clinical support personnel, and equipment and supplies for exactly the same condition, imposing variations on the cost of treatment (Kaplan & Porter, 2011). While this can lead to difficulty of estimating patient-level costs, cost can still be estimated on patient group level, in a manner similar to, or perhaps utilizing, DRG for forming the relevant patient groups, this being consistent with the preferred unit of measurement of Porter (2010).

As a whole, TDABC has some advantages. It simplifies the costing of complex processes by allowing higher coherence between resources and activities (Kaplan et al., 2014) making it easier for hospitals to compare the costs incurred to the reimbursements they receive. TDABC also simplifies the identification of opportunities for improvement (Hoozée & Hansen, 2014). TDABC has some limitations too, including the arbitrariness and difficulty of cost allocation when personnel work in different, separate processes, and the relatively high cost of data collection to support the model (Hoozée & Hansen, 2014).

2.1.3. Implementation of a new accounting system

In the implementing cost management system literature, a wide range of implementation processes is described. These processes have been developed both jointly and separately, from theory and practice, by both academics and practitioners. Some have remained as theoretical models whereas others have been extensively tried and tested through application in commerce and industry. The most common procedure is the needs led procedure, a top down procedure which is designed to jointly identify customer, business and stakeholder needs as well as monitor the business's progress towards achievement of these needs (Kaplan & Norton, 1996) And the process for implementing new system involves facilitating the senior management team through a review of their situation by asking two questions: *what are the targets to be achieved* and *how do we achieve these targets* (Jeanes, 1996)?

In addition, many articles focus on critical factors for successful implementations. For example, Campanale et al. (2014) emphasize the significance of top management commitment and the involvement of different professionals, as well as the integration of data-systems to ensure a successful implementation of a TDABC system.

Shields and Young (1989) identify that top management support and non-accounting ownership play a vital role in implementation. In addition to these two factors, Nah and Lau and Kuang also consider the effective communication, business plan and version as well as the organizational culture as important factors for implementation. The reason why these factors are important is that they determine the coordination and communication between the implementation partners and partner trust could present during the whole implementation process.

As with other administrative innovations, top management support for implementing new system is crucial because they can focus resources (e.g., money, time, talent), goals, and strategies on initiatives and business objectives they deem worthwhile since the consensus about and clarity of the objectives of new system among system designers and users are necessary to ensure that the new system and information are produced efficiently and are effectively used. In the meantime, top management could also help to share project missions and track goals, activities and benefits through effective communication with other team members to admit change will occur (Shields, 1995) as well as motivate or push aside individuals and coalitions who resist the innovation .

There are three methods to create non accounting ownership, in other words, increase acceptance level for other stakeholders within the organization (Shields, 1995). First, the strong culture is conducive to success, which could share values and common aims to people, second, management could create linkage to performance evaluation and compensation in order to motivate and reward other people to appropriately focus on and use information from the new system to improve organizational competitive position and profits. Third, the training, education and support should be available and highly encouraged. management should provide enough resources for such formal education and training to help other people understand the mechanism and impacts of the new system provides a mechanism for employees to understand and accept the new system as well as to feel comfortable with it. Furthermore, it is also important to have a cross-functional core team to invite other professionals to join in the design and implementation processes of the new system (Nah, Lau, & Kuang, 2001).

Shields and Young (1989) also argue that the successful implementation of a cost management system does not depend on technical resources, implementation success will be increased when different kinds of behavioral and organizational variables are used in concert, as part of an integrated implementation strategy. Instead of using these variables in an isolated manner, the combination of these, for example, top management commitment, common value and linkage to performance evaluation and compensation

provide a powerful and coherent package to indicate to employees that information provided by a new system is important to their own and their firm's benefits.

2.1.4. Accounting and organizational change

Accounting plays an important role in the organizational changes process. The first role is creating visibility in the organization, as accounting is powerful enough to influence perceptions, change organizational language and impact dialogue, and thereby determine what should be priorities, concerns and worries (Hopwood, 1990). Alternatively, the use of accounting information could be seen as a way of smoothing organizational frictions (Lukka, 2007). Besides having the great power of calculation, accounting is involved in objectification of phenomena, making what would otherwise exist in the abstract realm appear real and precise (Hopwood, 1990).

There are two definitions about accounting change. On the one hand, management accounting change can be understood as the introduction of new management accounting techniques such as ABC or the Balanced Scorecard (BSC) (Lukka, 2007). On the other hand, management accounting change can be viewed as the changing behaviors about how to use the traditional and/or new techniques. Many studies have been dedicated to the identification of the causes for change in accounting and support the view that management accounting is shaped by both the internal and external organizational environment (Moll et al., 2006). For example, Cobb et al. (1995) conducted an in-depth longitudinal case study of a division which took place in a large multinational bank by studying changes in management accounting reports. They looked at the drivers of accounting change which motivate decision makers to initiate and permit change. These drivers include changes in the broader external environment, such as market competition, innovation in digitalization, and changes in product costs. It also includes internal organizational demands, such as poor financial performance, loss of market share, new managers and accountants, and other organizational changes. In addition, they found that management agreed that environmental pressures were the primary reasons for most accounting changes but several of the change initiatives failed or encountered severe implementation problems due to internal barriers, such as changing priorities, accounting staff turnover and resistant attitudes to change. The influence of individuals as change agents is also particularly significant in his case.

2.1.5. Tensions and resistance to accounting change

Conflict and resistance to change has always been conceived as a significant obstacle for organizations that need to shift their direction and it is usually tried to be handled by tactics that perceive issues of change and resistance from a managerial point of view. Under these conditions the accounting change will fail to achieve its intended objectives. Regular consultation with subordinates, open communication between organizational levels, joint problem-solving meetings and objective management from top manage are

all effective measures to detect the existence of role conflict especially in highly stable organization (Rizzo, House, & Lirtzman, 1970) and many researchers suggest that managers could adopt various measures to manage a change process and to deal with resistance.

One option for managing those conflicts is to invite non-accountant to participate in the development of the new accounting change as well as the implementation process (Abernethy & Stoelwinder, 1995; Eldenburg et al., 2010). Coch and French (1948) have composed four different groups which were having different levels of participation in the change process and drew the conclusion that Individuals and groups who have the opportunity to participate in the creation and development of changes are less likely to resist the process of implementation than those who stay away from it. Therefore, the involvement of clinical staff can help ensure the costing model is clinically orientated which is generally required for the clinical staff to support accounting tools (see e.g. Coombs, 1987) Related, management could also hire cross professional as the intermediary agent to encourage professionals to forego some of the expectations of the professional role and accept the values and norms which underlie control systems. For example, France and Germany adopt a new position called medical controllers who are originally trained as a doctor and then specialize in cost control and financial management of medical institutions (Kurunmäki, 1999). Kurunmäki also describes in detail how cost management and performance measurement are fully involved by doctors and nurses who develop their own understanding about cost and performance management from daily work in the Finnish hospitals she studied.

Another way to clean obstacles to implementation of the proposed changes and minimize clinicians' resistance is increasing trust. the absence of trust is one of sources of conflicts and can have negative consequences for the performance of the organization such a cynicism towards change (Laschinger, Finegan, Shamian, & Casier, 2000) and also lead to the situation that people who distrust the system are compelled to resist (Culbert & McDonough, 1986, p. 187). Effective communication and establishment of common value has been shown to enhance trust significantly (Podsakoff, MacKenzie, & Bommer, 1996). By sharing information about the new system, interpretation of changes and common values with different groups, people could grasp the meaning and the necessity of change and accept it. Robbins (2007) has already found that development of trust, a development of information systems – including financial information systems – and, a sharing of this information is critical to the successful implementation for his case hospital.

In addition, building the same culture and shifting values of professionals in order to steadily pressure professions to move towards new legitimacy bases or accept erosion of power of accounting change (Abbott, 1988) could also reduce resistance. Besides, the lingering prevalence of bureaucratic practices is a serious problem that causes failure after implementation. The future and transformation of public organizations, such as the

medical establishment, depends on their ability to move beyond the obstructions imposed by traditional bureaucratic routines (Maddock & Morgan, 1998). Sometime, for reform efforts to be sustained, the development of a new organizational structure to support the changes and new system may be required (Robbins, 2007).

However, the nature of conflicts changes have varied depending on different point of view, some researchers such as Waddell and Sohal (1998) argue that the actual issue that the people resist is the uncertainties of the change rather than the change it self, According to this idea, Waddell and Sohal suggest management to view resistance and conflicts as important warning signals to fix its defects that are ignored initially instead of seeing them as solely a problem that need to be eliminated. Litterer (1973) also thinks that conflict and resistance can be desirable in terms of providing organization with energy and motivation during the change process. From a psychological perspective, conflict has usually represented dissatisfaction with the current state which has been an important source for growth and development for the organization (Waddell & Sohal, 1998). However, neither of them denies the perniciousness of excessive conflicts.

2.1.6. Resistance to accounting change and organizational support

From another perspective, accounting change sometimes also brings about resistance and conflict. Zander (1950) considers that resistance is a behavior which is intended to protect an individual from the effects of real or imagined change. According to Lewin (1951), there are two different groups that show opposed and favored attitudes and different types of forces are embedded in an organization when facing changes. In medical institutions, professionals and bureaucratic organizations always experience conflicts when facing changes, and several barriers could be identified which are seen to give rise to professional/bureaucratic conflict.

First, Zander (1950) argues that ambiguity in the mind of those who will be affected by change about the nature of change and existence of diverse interpretations about the change and its impact are two reasons that cause the resistance. Such ambiguity and diverse interpretations could exist due to the specific environment of hospitals where they have been said to be characterized by deep-rooted and *contesting* professional values and goal-incongruence between *economic logics* and *medical logics* (see Bourn & Ezzamel, 1986). A professional, once employed in an organization, maintains a high professional orientation or shifts their orientation towards the values and norms of the organization, therefore for medical staff, their primary loyalty belongs to their profession rather than to their employing organizations (Nyland, Morland, & Burns, 2017). In that case, many professionals held strong political, medical and ethical views that are always in conflict with the notion of accounting reforms(Broadbent, Jacobs, & Laughlin, 2001) and result in different perceptions of priority when making decisions. In other words, organizations always face an obvious tension between managerial (economic oriented) goals and the professional (medical-grounded) values amongst doctors and nurses in the accounting

change process. For instance, under the pressure of limited medical resources, the management will prefer to focus on financial control to reach the goal of cost reduction. However, professionals will feel that the treatment decision should not be affected by financial numbers. Some professionals will reject the accounting control in clinical organizations because they feel these financial and cost issues will reduce their department budgets and pose a great harm to the patient's treatment (Abernethy, 1996).

Furthermore, the barrier of accounting change could be the struggle of authority from the group of professionals. Lawrence (1969) mentions that one major reason for employees to perform poorly and to resist change was about the loss of social status within the organization and the ignorance of their skills in the previous setting. In hospitals, the core production activities: treatment for patients are dominated by professionals, these individuals often gain considerable autonomy within the organization. However, power and authority has continued to shift from medical professionals to administrators and financiers in certain health care jurisdictions by accounting change and control. Some clinicians consider accounting change as the redistribution of power and the gradual shift in control from professional clinicians to bureaucratic organizations as well as treat it as a subversion of professional judgement and as an unnecessary incursion into their jurisdiction which finally becomes strong resistance to, and covert circumvention of accounting change in hospitals (Chua, 1995; Coombs, 1987; Ezzamel & Willmot, 1993; Preston, 1992), Jones and Dewing (1997) and Preston et al. (1992) report of tensions between clinicians and technocrabudgets in the context of the implementation of UK NHS, the National Health Service reforms increased administrators' visibility over medical practices and thus enabled them to exercise government over clinical organization. Clinicians tried to defend their *territory* by limiting the legitimacy of accounting interventions since they thought accounting change distorted the exercise of professional judgment. During this power struggle, clinicians have questioned the validity of accounting information and insisted that medical activities be determined by the progress of medical techniques and clinical judgement.

Some researchers, however, argue that those conflicts and resistance should not be viewed as the absolute existence- that means conflict be seen as one of degree rather than as an absolute (Barley & Tolbert, 1991; Davies, 1983). Besides, those conflicts and resistance should be viewed in both positive and negative terms (Ezzamel & Willmot, 1993). Conflicts may potentially provide a negative impact on health care delivery and may even undermine the objectives of health care reforms, for example, clinicians might be distracted by power struggle activities. However, in the case of GP fundholding, these conflicts increased the interface between GPs and consultants as well as improved the processes of case management at the hospital interface.

2.1.7. Gap in knowledge

Driven by prominent ideas in the field, such as Porter's (2010) conception of value, giving rise to notion of value-driven healthcare and the development of the TDABC model in the first place by Kaplan and Anderson (2007), resource-focused costing models have come into prominence in the field of healthcare accounting, and more particularly healthcare costing, having been implemented in various different healthcare settings (Keel et al., 2017). Given the various factors that complicate the successful implementation of a costing system (Shields & Young, 1989), the process requires far more than just the decision of the management, being subject to influences from non-accountant professionals (Nah et al., 2001), prominently medical professionals (Campanale et al., 2014), the involvement of whom could reduce the resistance (Abernethy & Stoelwinder, 1995). Given the importance of communication in the implementation, the impact of the communication during the process has seen little research, and is thus an area of interest for this paper. The process and method of examination will be further reviewed in the Method theory, as well as the method and methodology section.

2.2. Method theory

This section will review the background of institutional theory, and to the extent necessary, considerations arising from organizational change literature, to construct an analytical framework based mostly on Zbaracki's (1998) framework to examine the research question.

2.2.1. Institutional pressures and organizational change processes

The key argument of institutionalism is that institutions matter, meaning the environment shapes organizations, which in turn shapes the environment it exists in (Moll, Burns, & Major, 2006). The approach has also been extended to the research of accounting, where different schools of institutional theory take slightly different approaches to the categorization of institutions, offering also distinct rationalizations for what are the institutional factors impacting accounting. For example, New Institutional Economics (NIE) tends to argue that accounting is configured to minimize costs or improve efficiency, whereas New Institutional Sociology (NIS) contests the idea, claiming there are external factors, not only a logic of efficiency improvement, that impact the role of accounting (Moll et al., 2006). An idea arising from the sociologically oriented institutional theory is that the societal institutions impact the actors within the society in three analytically distinct ways, known as institutional isomorphisms: *coercive, mimetic,* and *normative* (DiMaggio & Powell, 1983). Coercive isomorphism is a process where through formal and informal means, influence of other actors and cultural expectations is exerted on an organization, the mimetic isomorphism contends that the influence comes

through organizations' attempts to model themselves after organizations that are deemed successful, and the normative isomorphism describes organizational change as arising from professionalization (DiMaggio & Powell, 1983). What all these processes have in common is that they highlight an external influence that drives change in organizations, instead of the change being solely a result of a strive for efficiency, as NIE theorists would contend to be the goal in accounting. As a result of the motivations, change is not solely a response to a technical need but reflects the motivations and the symbolic value that created it, and in institutionalizing, values are infused to the organization (Selznick, 1957).

With regard to costing systems, researchers have used institutional theory to explain the motivations behind the implementation of costing systems, such as in the case of Portuguese telecommunications companies and their adoption of ABC (Major & Hopper, 2004) where in addition to seeking improvements in efficiency and competitiveness, the implementation was also an isomorphic response to multiple institutions, such as regulators and corporate stakeholders. Isomorphic responses have similarly been found to be a factor in governmental transformations, such as the adoption of ABC in Scottish local governments, where in some settings local governments adopted ABC, showing an isomorphic response, mainly seeking legitimation through the implementation, though the degree to which ABC was adopted varied greatly, as did the rhetoric on its usefulness (Arnaboldi & Lapsley, 2003).

Laughlin (Laughlin, 1991, p. 210) suggests, organizations will tend to maintain the current situation and only change when they are forced or disturbed into doing something, whether by the *environment* or *change agents*. Organizational change could happen in a situation where stakeholders in the organization deliberately try to disturb the current inert situation for some kinds of reasons to *correct* or *mold* organizational behavior (Broadbent, 1992). Laughlin (1991) develops the concept of *pathways* as the possible routes the disturbance can travel through an organization to make definition of accounting change. The pathway followed could be seen as developments over time. involving a variety of interactive discursive practices from stakeholders. Equally the pathway is not necessarily linear, it may be a circuitous travel without end destination. Laughlin (1991) argues that there are two types of organizational change, called morphostatic, or first order change and morphogenetic, or second order change. In a first order change the disturbance which causes organizational change may change the organizational structure, decision processes and communication systems, but core values remain the same (Levy, 1986), *making things to look different while remaining basically as they have always been* (Smith, 1982, p. 318), whereas in second order change the disturbance also changes the values and the culture of organizations replacing one belief system with another and thereby change the fundamental rules and assumptions about why events happen and how things should be done (Laughlin, 1991). This could be exemplified by accountingization in Finland, leading doctors to embrace accounting practices and incorporate them into

their routines, by for instance preparing budgets, as accounting has become a language for non-financial decision-making for non-accountant (Kurunmäki et al., 2003).

According to Laughlin (1991) there are two pathways for second order change, called *colonization* and *evolution*. The *colonization* pathway describes the situation where the disturbance is imposed onto the structures and systems of the design archetype with a clear intention of not just shifting the tangible subsystems but also to lead to major shifts in the very heart of what constitutes the organization. This means the change does not only extend to decision processes and communication systems, but also the core value systems, thereby altering fundamental assumptions about why events happen as they do and how people should react. The *colonization* pathway is very aggressive which is led by those who have power over the design archetype and relevant resources. Other people who disagree with such changes tend show resistance to reverse the change. Conversely, the *evolution* pathways emphasize the core of absorption instead of direct invasion.

2.2.2. Zbaracki's framework

Mark Zbaracki (1998), studying institutional forces and their management in the context of total quality management (TQM) in five organizations, developed a framework to figure out the relationship between the rhetoric of TQM use and the reality of its use. The division of the material to rhetoric and reality is based on the research of Barley and Kunda (1992) who studied management rhetoric, finding variations in the tenor depending on prevailing management ideologies in the United States. In this context, Mark Zbaracki defined rhetoric as the managers' stated claims and accounts of system use, especially in the context of ongoing organizational life, which could be represented as what people say for the system, and he have defined reality as the specific elements of system when come into use which could be presented as what people do in practice. According to his description, Zbaracki developed the relevant model of the evolving rhetoric and reality.

The model of the evolving rhetoric and reality has two major components. The first component is the description about how the system changes an organization. That evolutionary model follows work on adaptation from both an organizational (Miner, 1994) and a social psychological (Webb & Weick, 1979) perspective and the whole process could be separated into three stages: variation, selection, and retention. The cycles of variation, selection, and retention are nested because-sub-cycles occur within each cycle.

At an organizational level, at first the organizational members encounter problems or issues which motivate them to change the organization, so the system starts to introduce variation to organizational procedures. Various managers and different experts start to determine the rhetoric of the system to simultaneously shape the action of people and sustains their belief to make people understand the goals and mechanisms of the system,

and then Selection stage occurs when people encounter specific practices of the system and they could face two situations: system works well or not. Retention follows when organizational members alter their routines and rhetoric to optimize their system, people will select specific elements of it for their models and start the practice cycle again to observe the results and re-modify their ideas. by setting up a variety of selections and observing the results. They then use those results as they begin a new cycle by setting up different teams, again watching the results, and modifying their ideas. Therefore, the cycles of variation, selection, and retention are nested because-sub-cycles occur within each cycle and the system finally goes back out of the organization as rhetoric: success stories from those practices. The second component of the process model is the combination of rhetoric and reality at each stage of variation, selection, and retention. The combination of rhetoric and reality varies over time. During the evolutionary process some forces encourage rhetoric, while other forces drive out the reality. Zbaracki (1998) visualizes these three stages respectively to show how institutional forces can distort the technical reality of the system.

2.3. Adapted framework

We use Zbaracki's (1998) framework as general structure, adapting the model slightly for our analysis and evaluation of how the interplay of different groups of people and internal forces shape the whole process from institutional theory perspective. While Zbaracki's model uses different stages of sense-making process, we deemed it to be clearer to organize the process-view using more concrete stages of implementation that fit the case of PEC implementation. This analysis will be complemented by bringing in the consideration of accounting change pathways from Laughlin (1991).

Zbaracki's framework divides the whole procedure of introduction of a new system into different stages and explores the organizational objectives (rhetoric) and related strategy and effect of strategy (reality). Based on this, we develop a suitable evolving rhetoric and reality model for our case study. We divide the evolutionary process of the PEC system into three steps: design, implementation and utilization, using more concrete stages as the procedural element of the framework. Design is the beginning of the project of the PEC system, outlining the considerations and motivations taken into account in deciding what is needed from the system. Implementation covers considerations of the way the adoption is conducted, and the utilization step considers the early use of the PEC model to create and utilize information.

Zbaracki's approach will also be slightly modified, by examining the rhetoric regarding each step in the process in two distinct parts where apt, by examining the managerial sense-making process and the communication of information and decision. The first of these parts focuses on how the intra-managerial discourse and sense-making process considers each step in the process, and the latter part allows for focus on how the sense-

making process is projected forward through communication to the operational staff. Separating the rhetorical component into two thus allows for more nuanced examination of the interplay between different rhetorical elements. This distinction is also partially drawn from the distinct elements that were encountered during the data collection process, to have a more formal framework for making sense of the rhetoric. It should also allow for differentiating between a change that only impacts how management considers issues, and broader change that permeates throughout the organization, mirroring the distinction between first- and second- order organizational change.

To examine the first stage of the process, the design, we will study the institutional factors and forces that impacted the implementation of PEC, as well as the response of managers. During the review of the implementation process of the PEC system, managers who accept and believe the value and mechanism of the PEC system begin to take actions, generate rhetoric and turn rhetoric into reality to make it work effectively. We will try to find the impacts for different levels of people and discuss the pathway of the whole accounting change. In examination of the utilization phase, we will discuss how the PEC system interplays with other factors in the decision-making process. Throughout the analysis, the relationship of reality, and rhetoric, consisting of both managerial sense-making and communication, will be discussed. The consideration of reality will be drawn from people who have worked closely on the implementation and use of the model, as well as documents outlining the theoretical foundation and the technical nature of the PEC model.

DESIGN	IMPLEMENTATION	UTILIZATION
Rhetoric		
Reality		

Figure 1. The adapted Zbaracki framework.

In addition, during the whole analysis process, we will study interaction of different internal and external forces during each stage as well as summarize the form of accounting change of the PEC system based on Laughlin's (1991) concept.

3. Method and methodology

In this section the methodology and method of the paper are discussed. First, the research design will be discussed, followed by description of the data collection process. This is followed by an outline for the process of data analysis.

3.1. Research design: a simple case study

The main objective of this study is to seek to understand the impact of the PEC model on the human processes of decision-making, organizational relationships, and discourse, to gain insights into the implications and impacts of the model. Therefore, an interpretive epistemology was deemed appropriate for the study, leading to a qualitative research design.

The topic for this study was conceived of as an exploration of a costing system and the discourse surrounding its use in the adopting organization. This makes case study an apt research strategy for examining the PEC model, as a case study focuses on understanding the dynamics present within a single setting (Eisenhardt, 1989). Case studies could provide unique means of developing theory by utilizing in-depth insights of empirical phenomena and their contexts. Dubois and Gadde (2002) give us inspiration about how to conduct research based on the case study design. Case study is not a linear process. Instead it is an integrated approach, a nonlinear, path-dependent process of combining efforts with the ultimate objective of matching theory and reality, which enables this study to handle the interrelatedness of the various elements about the PEC system and decision making in this research work. By constantly going back and forth from one type of research activity to another and between empirical observations and theory, we can expand understanding of both theory and empirical phenomena to interpret the PEC system and decision-making in medical institutions.

Therefore, we consider the in-depth single case study as a suitable method for our thesis which enables the careful investigation of the implementation process of the PEC system and dynamic changes of decision making and management for resource allocation over time.

3.2. Data collection

To examine the PEC model and its use, we opted to conduct interviews and collect and examine documents pertaining to the use of the PEC model. The interviews were semi-structured in nature, allowing for gathering structured information, while also allowing for unexpected information arising from the discussions to be followed up. The relevant documents were collected by asking interviewees for documents they deemed relevant, as well as documents that came up in the interviews. Multiple sources could contribute to

reveal unknown aspects of the studied phenomenon, allowing us to discover new dimensions of the research problem (Dubois & Gadde, 2002).

3.2.1. Primary data

In total 10 semi-structured interviews were conducted. The length of the interviews varied between 30 and 100 minutes, the average being about 60 minutes. The interviewees were the CFO of the region, three controllers, a divisional manager and a doctor. The financing staff were interviewed to gain insights into the model, and the manager and the doctor were interviewed to gain insights into the use of the costing model, as well as the communication and transformation of the information it provides.

The initial intention was to conduct the interviews in person by visiting RH and interview more care personnel. The first three interviews were conducted in person in March, and we met with the divisional manager, a controller, and a doctor. However, the circumstances regarding the coronavirus prevented further safe travel between Stockholm and Halmstad soon after our return from the first trip. Therefore, the rest of the interviews were conducted over Skype. The initial plan was to interview people along the care chain, akin to previous research, to showcase the differences the new costing model makes for the care and resource management of a certain condition, but the circumstances made interviewing doctors and other medical staff difficult. As the preparations and caring for patients took the priority in the region, we deemed it to be appropriate to shift our focus to staff who are not working directly to care for patients, thus focusing on accounting staff, the CFO and a manager for the latter interviews, as well as shifting the analytical approach.

All the interviews were recorded with the consent of the interviewees to ensure accurate representation of their thoughts. The recordings were then transcribed, ensuring the themes discussed were fairly represented and all the direct quotes were accurate.

We attempted to conduct the interviewees in a relaxed way, without pressure, allowing for the discussions to develop organically, should they stray away from the main questions. If that happened, we came back to the main questions later to ensure we got the answers to the questions we planned to ask. When conducting the interviews, we attempted to remain neutral and refrained expressing our opinion, in order to avoid influences on interviewees. Where possible, we tried to confirm we understood the interviewees' arguments by summarizing their main points, and allowing them to respond and clarify, should they not agree with our characterizations. By attempting to ensure we do not misrepresent the interviewees' arguments we attempted to minimize the problem raised by Miles (1979) that some informants may disagree with case study reports.

3.2.2. Secondary data

During, and even before the interviews, we asked the interviewees to provide us with relevant documents pertaining to the use of PEC and KPP in the region. Additionally, publicly available documents on these themes were also collected. The documents collected include:

- Documents explaining the new costing algorithm for different care settings;
- A report on the initial results of cooperation with BWPO;
- An internally used presentation of the use of PEC;
- A list of the main KPIs used in the Region;
- Documents relating to the national KPP Principles.

These documents were examined to gain a picture of the formal processes against which the discourse and views of the interviewees could be contrasted.

3.3. Data analysis

Analyzing data is the heart of building theory from case studies. Data analysis processes often alternate with the data collection process in an iterative process of an abductive research approach. Content analyses help reveal themes and issues that recur and need further exploration and therefore theoretical categories emerge from evidence and shape further data collection (Eisenhardt, 1989; Glaser & Strauss, 1967).

In this analytic journey, both the organization of qualitative data into coherent stories of experience and sensemaking processes are essential analytic activities (Edmondson & Mcmanus, 2007).

Because one key point of within case analysis is that investigators should have a rich familiarity with each case, we try to collect information as much as possible to support our analysis and then build explanations based on our empirical findings from interviews and official documents together with the literature and try to offer a conceptual perspective that will then be discussed to develop explanations for the current status of management and accounting at our case institution.

The analysis itself is conducted by first coding and organizing the qualitative material along the empirical themes of design, implementation and utilization of the PEC model. Then, the data is further fit into the theoretical framework that is adapted to expand on these empirical themes with the separation of rhetoric and reality, as detailed in the method theory section.

4. Empirical Findings

In this chapter, the paper will outline the empirical findings. After some background of the case, the order of analysis will follow the process-view of the theoretical framework, first outlining the design considerations, then examining the implementation process, and lastly reviewing the early utilization experience of PEC.

4.1. Background

> Well we started 2012 with, when we had really bad economical [sic] status in the hospital. And then we started [integration the data-system]. And then we have been taking steps, and then we had the data lake first, the first data lake. (Divisional manager)

The initiator of RH's need to adapt the tools for decision-making came from the poor economic situation in the early 2010s. The response to the situation began with the consideration of how to improve the resource utilization, and as a response, the region implemented what they called the *data-lake* version 1.0, the first iteration of a system that combined data from the different units, allowing for more centralized process of data analysis in the region. Over the years, the digitized system was elaborated on to consolidate more healthcare data, and with the cooperation with BWPO, the data-system was imported to Microsoft SQL to combat the previous slowness and difficulty of working with the data (Region Halland, 2019a), enabling easier use of the data, also facilitating the eventual implementation of the PEC model.

4.2. Design

4.2.1. Factors influencing design

Upgrading the costing system is seen by some in RH as a part of the broader evolution in management. Much of the management sees Porter's (2010) value conception as an influential force behind much of their decisions. Measurements of performance and cost have become important parts of the decision-making process in RH, where at the operational level, issues that are dealt with - at least in periods of regular operations - based on analysis of KPIs (Divisional manager). There are, however, limits to how much of the decision-making process, and particularly the communication of decisions can rely on those measurements, as there is the CFO and the divisional manager both consider it critical any decisions are communicated to the operational level in operational terms, not based on accounting figures. The need to ensure the decisions are understood and accepted frames the decision-making process in RH. The CFO worries about the communication of cost having the potential to cause resistance towards the tools used to come up with them. Accounting-based management decisions, if communicated as such,

could be interpreted as NPM, which is seen as having a negative connotation in public management.

> There is the general discussion in Sweden on the issue of New Public Management. Of course, it could be interpreted as a way of NPM if the finance department suddenly came up with the PEC data and said 'you are not very efficient'. (CFO)

Both the management and the finance function see place a lot of consideration on how, thus, the financial information and decisions arising from it are communicated, where the CFO sees visualization tools as a possible way to ensure their message is understood, and the divisional manager frames decisions in terms of what way should the patients be cared for.

The clinically oriented perspective was also influential in the design of the PEC model, since having the cost-information accurately reflect the medical realities would make it easier to link the costs to medical operations, thus facilitating the transformation of that information to operational terms. Having costs information that is more reflective of the medical realities, particularly resource utilization, as highlighted by Porter and Kaplan (Kaplan & Porter, 2011), could also make for better discussions relating to service reorganization and resource reallocation (Controller A).

There are certain institutional bound setting limits to how RH could approach achieving the ambitions set for the new costing model. The Swedish national framework for costing procedures is set out in KPP Principles (SKR, 2015). The principles, mainly based on ABC (Controller A), set general guidelines for costing without, however, defining the exact way the costs should be calculated. This leaves a lot of room for how the KPP system is implemented, calculated, and how the information is utilized in different healthcare regions in Sweden.

Additional boundaries and guidance for the costing model were introduced by the setting of the healthcare system. As a single-payer system, the requirements for a costing system are different from a setting where every patient or their insurance company is billed on an individual basis. The Swedish single-payer system does not necessarily require the same identification of activities conducted to each individual patient, as the activities are not billed to those people, with the exception of out-of-region care, where the costing model gives the reimbursement amount that is paid by the region where the patient is the resident, to the region where the patient receives care. The focus on patient groups should allow for the management of costs according to the needs of those groups. Patient group level should be sufficient for studying the different costs between patient cohorts according to what kind of care they receive, or what other conditions they have. Similarly, the costs could be reviewed according to patients' compliance taking their prescribed medicine (CFO). While the costs are not identifiable to the level of each individual patient, the control of the costs can be conducted at a level which still allows for linking

them to operational realities, unlike a focus on cost units, which tend to combine the care of multiple different conditions.

Literature in healthcare costing has a big impact on the design and choice of the PEC model. This is seen from the explicit reference to Kaplan and Porter (Kaplan & Porter, 2011; Porter, 2010) in explaining the background of the PEC model in RH (Region Halland, 2019b). The ability to implement the key characteristics of TDABC permeates the rhetoric and communication of regarding the costing model, with a focus on the ability of the PEC model to be used to identify the patient groups with high costs (CFO) without the artefact of artificially inflated costs from underutilization of medical resources that could lead to higher apparent costs, despite this being a result of reduction in the need for care (Controller A). This is due to the calculation process considering the unutilized capacity and its cost as the costs are allocated onto the capacity to act, not the actions themselves, as a more ABC-like system would. A lot of management's optimism was centered around their potentially improved ability to make decisions based on more-nuanced cost information that reflects the actual resource utilization more closely, and thus makes it more meaningful to conduct cost-benefit analyses of investments (Region Halland, 2019b).

To implement the PEC model, there was a project group, including professionals from different settings, including the interviewed doctor. He, however, did not see his role as integral to the work of the project group, pointing toward management considerations being in the forefront of the design process, lesser importance being given to the direct professional influence of the doctors and other medical staff. He did, however, receive the PEC cost information for research after it was available.

There were also technical focus areas, such as the ability to cost certain services not covered by the old version of KPP. One such aspiration was the ability to include the cost of prescribed medication, an area that is left out of the national KPP principles (Controller A; SKR, 2015). The main problem the KPP principles presented was that the lack of this information could lead to a situation where a costlier treatment using medication is prescribed to a patients, since it shows up as a lower cost in the reported KPP figures, while the plausibly more affordable treatment option that requires a non-medicine alternative could be dismissed due if it is seen as costlier due to an incomplete costing methodology.

4.2.2. The PEC System

While the distinction is drawn when discussing the PEC model and the previous versions of KPP, PEC is still functionally a version of KPP. PEC can thus be seen as just an updated algorithm (CFO). The main difference where the PEC concept departs from the former version of KPP is that costs that are not-directly-attributable to patients are not divided between patients based on averages, but by conducting a simple calculation based on

resource usage, based on time used to provide the care. This resource usage is determined slightly differently for the different care settings, but to exemplify the situation with the inpatient care setting, the total costs that are not directly attributable to individual patients, such as laboratory tests and imaging, are divided to available bed-days, i.e. the capacity, and the per-patient costs are determined based on the individually attributable costs and the patient's length of stay, with administrative cost additions for the first and last day of the patient's stay to account for the costs of admission and discharge (Region Halland, n.d.). In other areas, the key resource being tracked varies depending on what is deemed most suitable, and what data is easily available, person-hours the main alternative to bed-days.

Since the KPP allows for variations in regions' KPP methodology, the PEC is compliant with the national guidelines, being Halland's version of KPP (CFO). This also means the PEC could generally function similarly to the old model when compiled. However, the PEC also adds the possibility of adding costs not allowed in the officially reported cost figures, such as the cost of prescribed medicine, for internal use (Controller A). This makes the tool more flexible for intra-regional use taking into account costs that hit the region, thus allowing for more holistic perspective of the total costs, which, however, comes at the expense of decoupling the most accurate cost data from the officially reported cost data, thus requiring more complexity in form of internally utilized and externally reported costs being separate.

PEC system is a simplified TDABC model designed, and both TDABC and PEC algorithms use time as major cost driver but use different ways to calculate the medical cost, for example, in the outpatient department, the TDABC model will record the time spend by patients in different care phase as the time driven factor and then sum the costs of all care phases, but PEC just record the total visit time for patients and separately multiple the time driven factors to sum the costs, and PEC classifies the time driven into clinic hours and physicians hours, which are all measured form angle of physicians instead of patients. On the one hand, PEC could be installed and utilized based on existing systems and data sources in Halland, which require relatively little cost of implementation, on the other hand, the drawback of the existing system such as the HR system which cannot record the clinic working hour in real time could affect the accuracy of the result of cost calculation. All in all, while the PEC system would not be perfect, the ability to provide more accurate data compared to the KPP was received optimistically, which was reflected by comments of the divisional manager that the use of the system could be valuable even before all the data used for it is fully accurate.

4.3. Implementation

Between 2016 and 2018 RH in cooperation with Brigham Women's Physicians' Organization, developed and implemented a data-system integration project to combine

clinical, human resource, and financial data into a data-inventory, with the goal of using this data research and operational development purposes (Region Halland, 2019a). The project also gave rise to an improvement in its accounting systems by enabling the use of an improved costing model, PEC. To implement the new costing model, a project group developed an algorithm for costing in five separate care settings: inpatient care, emergency department, outpatient specialty clinics, primary care, and ambulance services (Region Halland, n.d.)

The implementation of PEC happened stepwise, starting from the emergency department, and being implemented to other care areas later, with the latest additions onto the list in primary care and psychiatric treatment. The implementation has not always been communicated as PEC, and is sometimes considered just *continuous improvements in the system* (Controller C)

The implementation of the PEC model was widely understood to be connected to the broader data-system integration efforts, which was evident from the model arising from the BWPO cooperation which focused on improving data management and use of the integrated data-systems. Prior to the creation of the so-called *data lake*, the different hospitals, departments and clinics collected their own data using their own definitions. To collect all the data together, there was a need to create common standards for the form of the data, as well as the process of collecting it.

> Before this, everyone had their own way of definition. Their own way of collecting data. But now we're collecting the same data, the same way, the same minute, the same day, or month. -- [I]t was very, very big work of making definitions … [we moved] the work of collecting data from officers to professional data collectors. They do all the collecting of data for the hospital at the same time. We [previously] had every officer collect their own data, and it was pears and apples and bananas, and you could never put them together. And that was big, big work in the beginning. And then we've been taking big steps from there. (Divisional manager)

The process of implementation was thus a process of standardization, making sure there was a level of comparability in the data across RH and its units, which would be necessary to make use of the data from different sources within the organization.

Running the PEC model requires the supporting data-systems to provide the costing model with the necessary information to allocate the costs according to capacity usage. However, some of the tools providing that supplemental information are not fully accurate, and particularly the HR systems have been closely considered by the management, who decided to conduct a survey to update the costing keys that indicate how the doctors use their time in their work. As the wages of the medical staff make up roughly 60% of the total costs in the region, it is important for a costing system to allocate the staffing costs in an accurate manner, and the management is looking into getting slightly more up-to-date information from the scheduling tools, making this a key worry of both the CFO and the divisional manager. There are tools that could be used to provide

even more accurate time usage data, such as implementation of tracking equipment via new technologies, but there is a worry it would not be well received if the time usage of the personnel were constantly tracked. While better time-keeping could produce more accurate cost information, there is a worry of bringing back the time study man (Controller A). This presents one of the perceived differences between PEC and what a full-fledged TDABC system would be.

> …[W]e have the … principle that 80% when we start to use the new data, that's good enough. But we don't make any big decisions on that 80% of data, but we start to use them. We start to look at them. We start to see if they show us anything, something new. We ask questions. And we can tell this is not right, and okay, what's wrong? Tell us when we start to use the data, we can finally have, we have missed something. And we also, every year, we adjust the system, like this. Adjust, adjust, adjust, adjust. (Divisional manager)

Even without the support of a more accurate HR system to support it, the PEC model is seen as a *good enough* simplified TDABC model (Region Halland, 2019b), supporting the idea that PEC is not seen as an end goal but a step in the gradual improvement process. It supports decision-making by being slightly more accurate than the previous version of KPP utilized in the region, and to be a success, there isn't a requirement for the PEC system to be perfect, just that the changes provide some improvements to the former system.

To make the PEC more accurate, some new data was also required. A particular issue was making sure the doctors' time would be accurately allocated to make sure the total costs of each of the base resources, such as non-individually allocable cost per bed-day, would accurately incorporate the time doctors spent participating in care activities. Thus, RH *did a survey for doctors on how they spent their time, and [] used that to update the keys on how they divide up their time in the hospital* (CFO). This was used as the basis for updating the costing keys, and thus as a necessary piece of information for calculating costs for use in the PEC.

4.4. Utilization

The main utility of the cost information is in aiding the decision-making process, particularly by facilitating productive discussion regarding resource allocation decisions. To claim benefits from more efficient resource utilization regarding a condition in one department over the other, the responsibility of care must be transferred, along with enough resources to conduct the responsibilities in the new unit. This discussion, however, often tends to follow a traditional budgeting process, where units attempt to defend the resources they already have, and which can make transferring resources difficult (Controller A). Here, the use of the PEC model and the decisions derived using it have run into pushback and resistance, not from medical professionals, but from accountants who still maintain the traditional budgeting approach and are unwilling to

reallocate resources based on PEC calculations. Nevertheless, some limited benefits have also been drawn from PEC.

A success story of PEC is its use in the heart failure study (Yasin et al., 2020) which utilized the new costing model to provide the cost information for the two groups in the study, showing patients who receive appropriate care cost about two thirds of what patients receiving non-appropriate care, the assessment of which would not have been possible without making assumptions, was it not for PEC (Doctor). PEC has also helped in identifying other patient cohorts with higher costs, such as diabetes patients with mental health diagnosis, a group whose costs are three times higher than those of typical patients in the healthcare system (CFO). Once a problem area has been identified, PEC functions as a part of a 9-step methodology (see figure 2) aimed to provide a pathway for strategic decision-making (Controller A; Region Halland, 2019b). This is one of the main ways for utilizing PEC. The methodology combines the assessment of the intervention and its implementation costs, which are then presented to the decision-makers as a cost-impact matrix, implicitly allowing for the management to examine the value of the proposals, or multiple proposal, if you have conducted the same analysis for different interventions. This methodology is one of the main paths the costs assessments are communicated to the management. There is a desire among some controllers to adopt this methodology as a regular tool, both in internal resource allocations discussions, and maybe even in discussions with politicians, but this has not become a regular practice (Controller A).

1	Identify a problem and proposed solution to evaluate
2	Define cohort
3	Choose metrics of interest
4	Perform current state analysis
5	Model the intervention
6	Quantify implementation costs
7	Determine future state impact of the new process
8	Present the analysis to decision-makers
9	Monitor implementation to find and fix problems

Figure 2. The 9-step methodology for strategic decision-making. (Region Halland, 2019b).

The role of the PEC in this methodology is in estimating the current state and future state cost of the proposed intervention, enabling for an estimation of the return on investment of the proposed solution by combining the projected cost impact on the operational costs, and the cost of implementation which can then be presented to the decision-makers, which should make for better-informed decision-making (Region Halland, 2019b).

However, whether that solution is acceptable to different actors may still vary. Additionally, if the solution saves resources, it is still far from clear whether these savings are actually incurred, or if the resources once gained are sticky and remain in someone's budget which could lead to a situation where resources for a specific purpose are used more efficiently, but the saved resources are used for other issues, not because of allocation by design, but by almost an accident (Controller A).

While the PEC required additional information, such as the human resource and clinical data, it has also given new opportunities for using the cost information. The broader availability of data from the newly integrated data systems has made cost information more widely available throughout the organization. As an example, as a part of the cooperation, A KPP calculation was developed for primary healthcare, a part of the healthcare operations that was not required to be reported (CFO), and thus was not collected previously. The cost calculations were also done for ambulance services. However, since they are not a part of the core organization of the region, and are purchased from other care providers, the project was a one-off event, and there has not been further interest to develop the measure on a more continuous basis.

In addition to data-availability, some see potential in the PEC aiding in diagnosing operational issues in the region. While currently when problems in operations arise, they are identified based on operational KPIs, but there is some optimism in costs being used to identify areas of improvement.

> Our KPP is not so enough developed so we could make decisions that way [by looking at the costs first]. But we are working on our systems, so we think we will reach that level where we can go into costs, and say, okay, we have big cost problem that leads to bad quality and start that way. -- we should be able to see costs, for instance, stroke patients in Halmstad and see costs in stroke patients in Varberg. Is there any difference? And okay, this hospital has better cost profile – why? (Divisional manager)

While there are some successes and a lot of optimism regarding what the PEC might be able to provide, there is also skepticism about how much impact the PEC itself has. Since the model is very interconnected to the data-systems, while not being the only use for the data, the skepticism manifests in doubt of what degree of any operational improvement is attributable to the new costing model.

> I will not attribute anything to the PEC model alone […] The PEC model maybe improves something one percent because the question is how the first 99%. I cannot see how the PEC model by itself does any difference in how you are going to use information. It's more like a steadily continuously improvement of the model. We do it all the time. (CFO)

Instead of arising from cost-consciousness per se, the CFO sees a lot of the efficiency improvements arising from a philosophy of keeping the patients in the hospitals for as little time as possible, since care in the hospital is more expensive than other forms of

care. *[I]t's always better not to be in the hospital* (CFO). While this could be counterproductive to achieving high quality if patients are discharged too early, there seems to be a self-balancing mechanism to this philosophy. If patients are not getting high enough quality care while in the hospital, their conditions tend to get worse, requiring readmission, and thus this philosophy, at least theoretically, should not incentivize discharging patients earlier than what is medically sensible. The CFO also sees this as a possible way to free medical resources to care for the growing population in the Region, or to even reduce beds, which RH has been able to do, an achievement the CFO partially attributes to the push of soft control by requiring doctors to set plans for the date for discharge should everything go to plan (CFO).

> By making people from day one making a plan for when they are going to send home the patient, then something happened with the mentality, like okay, put the goals we think is reasonable, that this patient can go home in four days, now let's work on that. Of course, that can change if something happens, but if you don't put it, there's a lot of, oh let's see, oh let's see, oh let's see. (CFO)

The cliché of what gets measured gets done is understood to be part how the management can control the work. This, however, is not a sufficient strategy for communicating decisions in the first place. The proper communication is seen as paramount for ensuring the decisions are understood.

> You need to use language and words that they can understand … The translation is very important … We use money, we talk about the cost per patient and we also make calculations about the potential of change when we are on a high level, but the further down we get in the organization and when we doing the work, we lean on quality measurements…..when in management level, we have both angles for quality and costs ... but in operational level, we focus on quality of healthcare and concern about the suffering of the patients … For example, don't say costs are too high which is not understandable, doctors just think we ask for more money, you could say we have to shorten the time for treatment or we can't get the nurses needed, so the language is understandable. (Divisional manager)

The PEC, while improving the cost information, has not provided the management with a magic bullet that could be used for communicating financial information, but the transformation of that information to operational terms remains a key part of the decision-making process.

5. Analysis

In this section, the empirical material will be reviewed through the lenses of the theoretical framework. Along the three-step process of design, implementation and utilization. For each step, the institutional pressures and their communication shall be reviewed according to the reality of the system, the managerial rhetoric and the communication of the information to the clinical staff.

5.1. Design

5.1.1. Institutional forces leading to a modified TDABC model

The main considerations concerning the design of the costing system come from existing literature and tendencies within the institutional sector, with a *jolt* (Laughlin, 1991), an environmental push to change. To this effect, there are multiple institutional powers present that influenced how the PEC came about. Following the three *isomorphisms* (DiMaggio & Powell, 1983), there were coercive factors, mainly in the form of the national healthcare costing guidelines, the KPP principles, whose role, however, was limited to setting boundaries for what could be done, and even then, this only applied to externally reportable figures. This was apparent in the adoption of the costing model to processes that are explicitly excluded from the KPP principles, most notable the costing of prescription medicine. Thus, the impact of the directly applicable regulatory framework on costing was somewhat muted in the design process of PEC.

Mimetic and normative pressures presented more prominent influences on the design of the through the impact of the BWPO cooperation, which is where the main considerations arose. The concept of PEC, being developed by BWPO together with Robert Kaplan, a prominent figure in management accounting and costing methods, as well as the literature on TDABC, spearheaded by Kaplan (Kaplan & Anderson, 2004, 2007) present a mimetic pressure to adopt a system aligned with their authoritative status. It is, however, important to note that the influence of Kaplan was not solely institutional pressure to adapt to these trends and arose also from their proximity to the cooperation. TDABC, and by extension PEC, also responded to the pressures posed by management's understanding of the communication priorities as it relates to transforming the information into actionable decisions that can be undertaken on the operational level. Accounting information, if not aligned with the operational realities, has been difficult to communicate to medical professionals without resistance and tensions arising in the process. Understandability of the accounting information being one of the key concerns of the finance function, the more clinically oriented the costing tools are, more readily the information is transformable into usable form for decisions, thus giving a reason for the finance function to align its costing tools with the operational reality.

There is also a longer-running undercurrent impacting measurements and diagnostic control systems as a prominent control tool, popularized in public management by NPM (Hood, 1991). The empirical understanding of the concept in RH reflects the broadly negative connotation of NPM as resulting in control by top-down measures. Avoiding this connotation presents a challenge the management wanted to avoid, impacting the amount of consideration that has been given to the communication of the information in a way that avoids recreating this message.

In summary, institutional forces impacted the design of the costing system through an authoritative approach for costing and the related literature (Kaplan & Anderson, 2007; Kaplan & Porter, 2011; Porter, 2010) and internally recognized need to respond to the requirements needs of the professional core of the organization by accounting for how the costing information is communicated to them via the decision-making process. Additionally, the regulatory framework set boundaries to which the costing system would need to adhere to, but due to not being the origin of the system reform, the direct impact of the coercive isomorphism was limited.

5.1.2. The model of the evolving rhetoric and reality

The pressure of limited medical resources, public finance and high cost of some patients forces Halland need to into actions, which tentatively break the current balance in the organization, facing such external adverse financial situation and internal demands for improve calculation accuracy of medical cost, management in Halland research through documents and past cases that had similar circumstances through frequent discussion of management groups in order to develop an improved accounting cost measurement system, which finally comes to the PEC algorithm and will put it into the next stage-implementation.

Motivated to improve the existing integrated data-system, the initial data-lake and taking advantage of the cooperation with BWPO, RH responded to the pressures leading to the decision of implementing PEC. While there were independent motivators and influences that could have led to the implementation of the costing, being developed as a part of a broader improvement in integrated data-management systems makes sense due to the requirements of the costing system. The data gathered and consolidated in the *data-lake*, having its own use for data-driven healthcare, also provided an opportunity to take advantage of the data by using it to improve the costing systems. While the motivations for an improved data-system were aplenty, and institutional forces, particularly mimetic isomorphism provided push toward a TDABC system, the *jolt* came in form of the BWPO cooperation project.

Despite the optimism about PEC as a method for improving the costing model in Halland, the design was mostly influenced by the BWPO cooperation, as it was a method of improving the utilization of the data gathered in the integrated data-system. While the

push toward TDABC was motivated as a response to the development in costing technologies, the process generally followed the BWPO cooperation project, providing a path for gradual improvement in the finance function's practices.

Management sense-making

Through the lenses of management's use of Porter's value conception, the improvement of the costing system was a natural continuum of the improving decision-making in the organization. While some in the finance function saw big potential in the PEC model, CFO's view of PEC being mainly a rebranding of the existing system is also indicative of PEC only providing limited advances, and thus, the change it the system would have could be expected to be limited. Nevertheless, an improved costing model and the opportunity of using it is also seen as a plausible method for improving the accuracy of decision-making by providing more representative cost information for assessment of possible reform proposals, by making assessment of costs throughout the care journey more accurate, and thus facilitating making resource-allocation decisions.

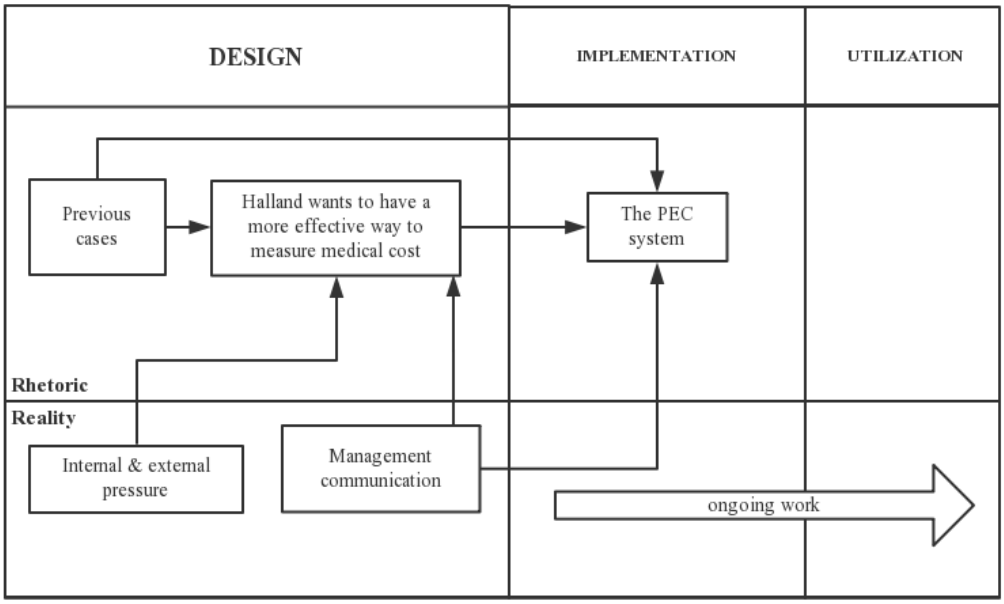

Figure 3. The model of the evolving rhetoric and reality in the Design stage.

5.2. Implementation

5.2.1. Impact cycle in the stage of implementation

After the design of the PEC system, management needs to implement the PEC system into the whole organization successfully in order to obtain information with higher quality to support the analysis and decision making, However, the relationship between accounting change - the implementation of the PEC system - and the organization is a

complex network, which is composed of many kinds of connections and mutual influences, and is constantly evolving over time. To make sense of this, the impact of the PEC system was pictured (See Figure 4) to separate out the complex interacting forces for the sake of a clearer exposition of how they are related. Each of these relations is discussed separately. This impact cycle which is founded during the implementation stage and completed during the utilization stage also shows the influence and role of the PEC system to different levels of people.

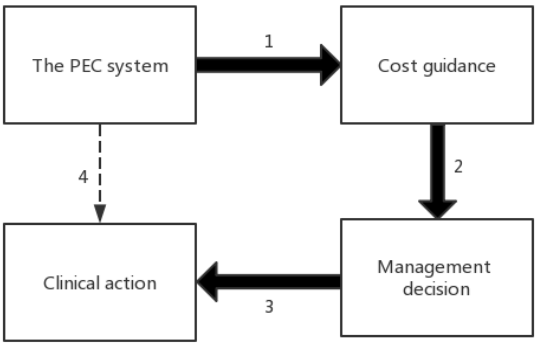

Figure 4. The impact cycle.

Relation 1 represents the link between the PEC model and costing guidance. More precisely, the relationship between accounting change and the organization is a complex network, which is composed of many kinds of connections and mutual influences and is constantly evolving over time. The PEC model not only changes the old cost measurement system, creating and providing new accounting figures to management, but also provides a new cost guidance. i.e., how to calculate actual costs and measure the performance effectively and correctly.

Relation 2 reflects that cost guidance could directly affect decision-making at management level. PEC systems added a new cost evaluation dimension to the decision, making process, inherently linking medical practice with economic performance. When the PEC system accurately judges the causes of cost and the actual number of resources consumption and expenses and provide this data to management, different managers will utilize this data and information to understand the current situation and judge the problem according to the information, and then make relevant decisions

There is a classic case we found in while researching that explains the relation 1 and 2. Managers in RH have recognized that optimizing the cost structure of health care, in particular making the effective allocation of medical resources among different departments in order to avoid the most costly and inefficient parts of the treatment process, is the key to improving the quality of care, which is also the major challenge at present, and this pressure has been passed directly to managers. Due to the complex hospital environment characteristics which lead to the problem of uncertainty of cause effect relations (Thompson & Tuden, 1959), it is difficult to reasonably calculate the

resources used by each patient and track all expenses related to specific medical services. Hence managements want to seek ways of measuring cost-effectiveness more frequently and more accurately, and to use this information to make resource allocation decisions more explicit and transparent, which was an important part of the sense-making process that was partially behind the implementation of the PEC system. In fact, PEC system could provide detailed cost information and the linkage between costs and activities, and it could thus be considered a *clinically oriented costing tool* (Campanale et al., 2014), being able to provide a transparent representation of the reason for costs (activities) to better support the distribution of available resources.

The introduction of PEC did not only come as an impact to the costing figures, but it was a part of a broader change in management philosophy. After introducing the PEC, for example, the number of beds became a more important KPI to measure the medical cost and performance. The decreasing number of beds means was a result of on average shorter hospital admissions. The PEC made it easier to assess the high cost of patient cohorts, making the identification of such groups more accessible. Knowing the cost of distinct patient groups should make it easier to assess where the medical staff can do the most good and provide the most value. Correspondingly, managers can formulate the control strategies to avoid long patient stay in the hospital when shorter stays would be sufficient, therefore freeing resource to be reallocated elsewhere in order to reduce the average patients costs but achieve the same or better treatment results, implying an increase in the value of healthcare.

Compared to the old KPP, the PEC adjusts the cost guidance by giving managers a new point of view that emphasizes time as the key driving factor to determine the individually unidentifiable medical cost and resource consumption, thereby helping move the managements' attention to time-driven indicators of medical performance, such as bed-days and discharge time. This attention is also reflected in the subsequent decisions determining which medical interventions should be prioritized in being provided to patients and how the resources are allocated. Because of the PEC model, the management could have a clearer understanding about the link between costs and medical activities in order to evaluate the resource utilization and performance of clinical department in to take actions to reduce the number of inefficient medical activities, such as excess hospitalization, while emphasizing the importance of resource allocation to improve the resource utilization efficiency of medical activities in effect leading to better cost control.

During the implementation stage, interaction between the PEC system and management in Halland have successfully consolidated relation 1 and relation 2 as well as the foundation of the whole impact cycle, and we found the next step is to manage the problems for establishing relation 3 and relation 4. Many researchers studying accounting changes in medical institutions will mention that there is a struggle to decipher who has control of resources and costs in the hospital and to measure the degree of authority

between management and clinicians. Clinicians control medical activity and therefore the direct consumption of resources. Yet the management oversees making and taking responsibility for resource allocation decisions. We found that Halland has its own strategy to manage such tension and we will discuss it in the utilization stage.

5.2.2. Institutional pressures during implementation

The implementation of a costing system is impacted by the institutional reality it happens in. Particularly the influence of different professionals is seen during the implementation process as a form of normative isomorphism (DiMaggio & Powell, 1983), where the educational and professional expertise of these professional groups impacts the implementation of the system. The operational core of the organization, i.e. the clinicians, presents a key group to which the system has to appear as legitimate should resistance want to be avoided. Additionally, the part of the organization where the new costing system has the most tangible impact, the finance function and the accountants, have a great influence over how exactly the new systems functions.

5.2.3. The model of the evolving rhetoric and reality

In this part, the implementation process will be reviewed in accordance with the theoretical framework (see figure 5).

When Halland management prepare to implement the PEC system into the operation, they consider potential opposition power from non-accountants (i.e. medical professionals) who might hold suspicion for the PEC system, and show resistance to any kind of accounting change itself if such change could impact their daily work or invade their medical professional territory, so management in Halland are committed with their involvement and wiliness to legitimate the goals and objectives of the PEC system for professionals who know PEC system through effective communication in order to build strong commitment with professionals that using this system could achieve the same aim for both management and clinicians. This stage is totally at the discretion of management level in order to limit the direct impact in clinical organization and therefore avoid conflicts. This also indirectly reflects the actual authority structure in the organization. Additionally, during the whole process of the implementation stage, management got a new point of view to measure the medical cost more accurately to figure out the actual reason for the high cost in the department, helping with the next step of decision-making based on this cost guidance, which is also a critical factor in the next utilization stage.

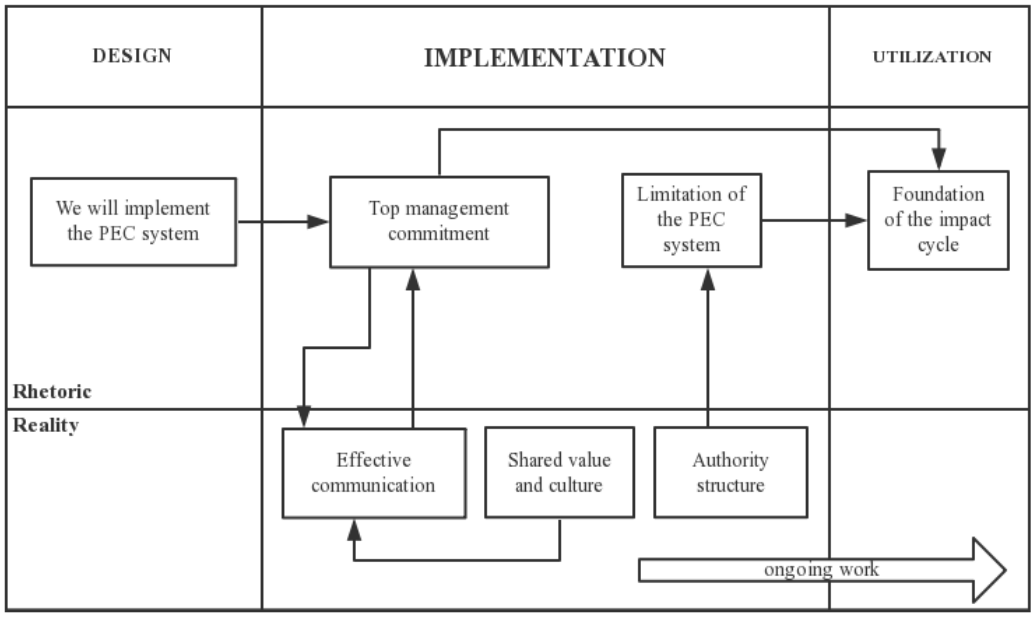

Figure 5: The model of the evolving rhetoric and reality in the Implementation stage

Management sense-making

In the process of implementation, Halland's management are the project leaders of the PEC system and there are two forms of rhetoric that managers generate as the advocates of the PEC system.

One form of rhetoric simply performs as the top management commitment to the PEC system. For example, the project group of the PEC system is controlled and managed by decision makers in management level throughout the whole process. This project group will hold internal meetings to discuss and determine how to introduce and utilize the PEC system and ensure all the management accept and have the same understanding and expectations for the PEC system. This rhetoric reflects the commitment of the top management that the PEC system could receive approval and resources from top management and align with strategic goals. In Halland, top management explicitly identify the priority and key points of the implementation procedure and legitimize goals and objectives to other management functions, such as controllers and accountants, who are committed with their involvement and willingness to allocate valuable resources to the implementation efforts, which fosters and ensures better teamwork and cooperation, and influences implementation success (Abernethy & Stoelwinder, 1995; Eldenburg, Soderstrom, Willis, & Wu, 2010). For example, management of the PEC project group establishes uniform definitions for figures, indicators and information provided by the PEC system and shares those definitions to the organization. Therefore, strengthening the relation 1 of the impact cycle.

Communication

The level of rhetoric communicated to the operational staff has to consider the limitations of the PEC system. The emphasis is on managing the impacts of introducing the PEC model within the particular areas in hospital. From the management's point of view, the new accounting cost calculation system seems to affect little on apparent changes for organization, as well as having little influence on the basic structure of organization and the decision-making, implying little to no second order change, as it relates to accounting and organizational change literature. This seems to indicate that while there is change, its deeper cultural impact is limited. The CFO in Halland also downplays the impact of the PEC model, saying it does not cause fundamental changes, being just a step on a continuous path of gradual improvements and thus the PEC does not challenge the existing accounting paradigm.

The tangible changes to daily work from PEC are seemingly minor, but the intangible change actually happens just as we mentioned before, as compared with the old KPP model, PEC is able to give managers a new angle to the form of medical cost and resource consumption which is based on time driven factor, and thus determine what types of medical service and how much medical resource should be received by patients . However, such intangible change has limited impact, and being possibly difficult to attribute to PEC.

In addition, according to our empirical findings. Management, as advocates of PEC, held most of the control in the cross-functional PEC implementation project group, giving a limited role to the medical professionals, contrasting with the implementation processes in previous literatures (see e.g. Campanale et al., 2014), where many researchers argue that the participation of medical professionals is necessary, and encourage them to involve in cost and financial management is essential for successful accounting change in medical institutions which could also could avoid potential conflicts and make implementation go more smoothly. However, in RH, non-accountant stakeholders such as clinicians can acquire only some data from the PEC system and therefore minimize the direct influence level. Additionally, management is the main intermediary agent constructing the relations 2, 3 and 4 in the impact cycle to subtly diffuse influence indirectly without causing conflicts.

During the implementation process, the whole management level expressed a high level of acceptance and support to the PEC system, however, there also emerged a certain amount of resistance in the clinical organization to this rhetoric. For example, doctors' representatives who could contact part of the PEC system showing his skepticism for PEC's effectiveness, by saying he did not completely understand the model, and that he was only given the figures, being told they would be more correct. But this sort of skepticism was quite modest, as the doctor also indicated that the PEC model was able to provide information that was not available with the old KPP or would have required doing

additional assumptions and was thus valuable for research purposes. The management also created a number of forces to manage the relevant tension. First, the authority structure and position of management in Halland removed most of the obstacles during the implementation process, which is also the foundation of these fours relations as well as ensuring the impact cycle could work well. If we compare Halland hospital a sailing ship, clinicians are engines which have their professional standard and operating mode thus any improper interference could spill over into confusion. The management are the helmsman of the ship who deliver instruction to engines to determine the destination and essentially control the whole organization. However, it doesn't mean Halland has vertical organizational structure, and the management tries to get involved in the work, not by controlling the medical professionals, but by cooperating with them (Divisional manager).

In other words, the relationship between management group and clinical organization is friendly cooperation, management tries to use effective communication to involve into the daily work of clinicians and show enough respect as well as maintain enough autonomy to these medical professionals in the meantime in order to keep such delicate balance of authority in Halland.

Secondly, management and clinical organizations establish the same idea of human centeredness, focusing on the patient perspective. A culture with shared values and common goals plays a vital role in successful implementation of new system. As we mentioned before, most professionals did not care about financial issues. They also didn't have comprehensive understanding about concept, algorithm and mechanism of the PEC system, but they always abide by professional ethics, wanting to do the best they can for their patients, management also have the same mission but they just realize and approve Porter's concept of value (Porter, 2010). The interviewed doctor also saw the same issue, pointing out that poor care quality and high resource usage were usually connected.

Thus, when medical professionals expressed their opposition. They were naturally reluctant to the control and uncertainty from the management instead of PEC itself, and a culture of Shared values and goals that is conducive to success, as well as cross-group and cross-disciplinary communication, which are useful tools for management to make effective communication with these professionals to manage such tension. Effective communication combined with common culture and values is an effective tool for management to mediate between parties in the time of conflicts. Usually management will focus on communicating importance of the PEC system to legitimize new goals and objectives about using the PEC system with the strong commitment that using the PEC system could help the hospital achieve its goal: improve patients' healthcare situation.

All in all, there were few if any conflicts arising from the implementation of PEC in the hospital. The management commitment under the authority structure and effective

communication with common goals was sufficient to facilitate the implementation of the PEC model in Halland.

5.3. Utilization

5.3.1. Impact cycle in the stage of utilization

In the design and implementation process of the PEC system, Management have played a leading role to establish the cycle impact and have implemented PEC into the whole organization successfully, The PEC system is able to provide more accurate information to measure the cost and performance in the clinical department to figure out the causes of cost. These information and analysis results initiate the establishment of relation 3 and relation 4 in the figure of the whole impact cycle. Management proposes the subsequent decisions with the support of the PEC system to solve the problem of improve the current healthcare situation, thus the priority for the next step as well as the rhetoric of the utilization process is to ensure the decisions could be implemented promptly without delay and to ensure the PEC system-accounting change could bring substantive impact on clinical behavior, which help the whole medical institution achieve the final aim: increase the value of healthcare based on the Porter's value concept.

Relation 3 in the impact cycle (figure 4) illustrates how to implement management decisions to clinical organization and thereby change the clinical actions to achieve the specific target, Through interviews with managers and doctors, we found that clinicians see their role as only having a professional dimension without any intersection with an administrative dimension such as financial or cost management. They tend to accept accounting changes or financial decisions with little resistance, and they know only a little about financial issues. While they could have access to some of the financial information, their work does not require them to take the initiative to learn anything about accounting, and thus even if there was better access, doctors would likely have little use for the cost information. Therefore, the PEC system does not provide a direct impact on clinicians to guide their activities. The adjustments of clinical actions were not caused by the PEC system itself, which reflected the limitation of the PEC system as well as requiring the management to use other kinds of control levers to manage it. We will discuss this with relation 4.

Relation 4 captures the indirect influence of the PEC system on clinical practice. This arises as the PEC model is expected to change the treatment decisions of doctors with limited opposition, by combining specific management control systems and identifying best practice in terms of both quality and efficiency. While for clinicians, identifying best practice in terms of clinical quality has always been the most important part in medical discipline, management already understands the criteria that higher costs tend to represent bad healthcare performance, meaning the management has linked financial factors with the medical quality and want to improve the present situation. However, the management

clearly understands that directly inputting such criteria will create unnecessary authority conflicts and contradictions with the clinical organization under the background that few medical professionals participated in the whole process of implementing the PEC system. The management does not think they can communicate the cost information in the language of accounting, and therefore, they try to express their consideration and decision from the patients' point of view in order to have the same frame of reference as the clinicians, based on the common value and principles. In Halland, management interacts with the clinical leadership who could directly control and affect clinical activities in their departments. The management avoids talking about costs or any financial indexes to clinical leadership, trying to relate their decisions to other types of KPIs instead. For example, the management focuses on operational indicators such as numbers of beds or length of stay of visits and link them to medical results and explain the potential relationship with the operational indicators.

The chain of logic behind such explanations is to make clinicians change their current treatment decisions to avoid hospitalization in order to reduce the costs and increase general resource utilization. Management uses relevant information from the PEC system in a package and discusses everything from the same core belief perspective (do everything better for patients) to minimize the direct impact of accounting. In doing so, the PEC model indirectly impacts clinical activities although clinicians, even if this is not recognized by the clinical staff.

5.3.2. The model of the evolving rhetoric and reality

Generally speaking, the purpose of the utilization stage is to make sure that the decision-making process could progress smoothly, and the financial decisions guided by the PEC system could be implemented successfully. However, most clinicians will not easily accept to adjust their clinical behavior because of accounting and cost issues. Therefore, controllers and accountants perform as facilitators of coordination to manage the goal-incongruence between economic logics and medical logics, which aids in achieving full and effective implementation of management decisions in clinical organization but also transfers the indirect impact of the PEC system to clinicians.

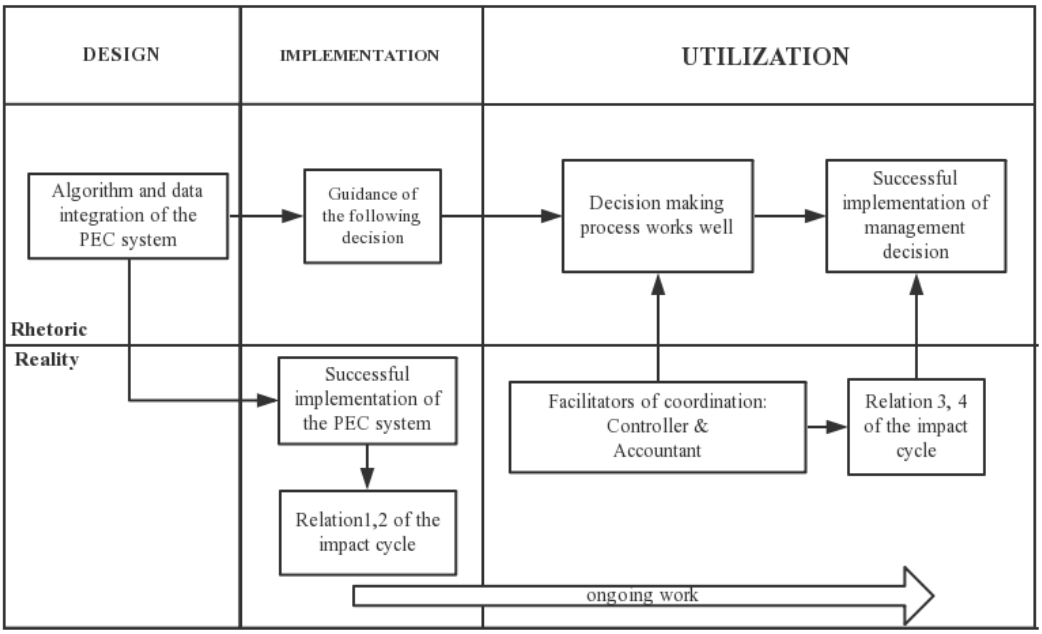

Figure 6: The model of the evolving rhetoric and reality in the Utilization stage

After the implementation stage, the PEC system completed the calculation of the cost of medical service and made analysis to draw the conclusion that fewer hospitalizations, lower medical cost, so the management wanted the clinicians to adjust their treatment decision to reduce times of hospitalization but also ensure the quality of medical treatment at the same time, which could decrease the average medical cost for each patient, increase the utilization of medical resources In other words, this decision could allow Halland hospital treat more patients with limited resources.

However, the limitation of the PEC system lets management and clinical departments have different expertise and understanding of PEC, which causes the decoupling between the medical professionals and economic logics. Our empirical findings argue that Halland Hospital has been said to be characterized by deep-rooted and contesting professional values and goal-incongruence between economic logics and medical logics. In Halland, financial responsibility is not directly assigned to clinical departments, and doctors and nurses do not need to take cost and other accounting factors into consideration when making treatment decisions. Since clinicians lack the financial knowledge to guide its measurement of medical value, they only use the medical results as the only index to evaluate their performance and guide their medical behaviors, that is to say, the clinical departments neither understand Porter's value concept or the relationship between the cost and medical quality. However, management has this economic logic and tries to make decisions to change clinical actions. Therefore, an obvious issue is that hospitals always have a contest between managerial objectives and the primary objectives of doctors and nurses (Bourn and Ezzamel, 1986). That is, in Halland, there is potential for tension

between managerial goals guided by the PEC system and the medical-grounded values amongst doctors and nurses in this professional-oriented organization.

Traditional views would purport that management tend to adopt vertically oriented managerial controls to ensure successful implementation of the management decisions at lower practical level, such control strategy are rules or policy-based mechanisms which managers intentionally use to influence employees (Abernethy & Chua, 1996; Carlsson-Wall, Kraus, & Lind, 2011), aimed either at control over behavior or control of outcomes. However, many previous literatures suggest when activity levels are characterized by high dependence, complexity and continuous change, it is difficult to use vertically oriented managerial controls (Nyland et al., 2017). Especially when management's objective is to increase control over the behavior of the professionals who have traditionally dominated decision making in hospitals (Chua & Degeling, 1991) medical professionals will take actions to engage in protecting their own autonomy, and hospitals might run the risk of becoming trapped in what (Crozier, 1964, p.187) refers to as a *bureaucratic vicious circle*. Some professionals try to evade these controls, which is then countered by a new round of standardizing regulations and finally the organization becomes *frozen into a completely inflexible structure* (Young & Saltman, 1985, p. 36), which not only threaten implementation of decisions, but also has adverse effects on organizational operation and survival. Therefore, Halland needs to find a way to ensure successful implementation of management decisions at the clinical level under these complex settings without significant resistance and conflict.

In our case study, we discovered that the facilitator (i.e. The controllers, accountants) and have a critical role in terms of implementation of decisions. They performed as supporting actors helping the discourse between top management and the clinical organization during the whole decision-making process to facilitate coordination across different groups. In fact, facilitators build strong inter-connectedness between management and clinical organization in hospital , they collect and use data from the PEC system and discuss financial numbers with top management to make decisions, then they are expected to communicate the signals and demands from these decisions to clinical organizations by using another special mode of presentation, take responsibility for actual performance, and then communicate results back to the management groups. For example, when the management wants to decrease the expense in a clinical department, facilitators will discuss with the clinical leadership who control the medical behavior, however, they will not discuss anything related to cost or financial management, they will try to use different language and talk about everything based on the patient's point of view. For example, accountants will translate financial indicators to operational or medical indicators, such as fewer hospitalization is beneficial for patients' therapeutic outcome and persuade clinical to adjust their relevant treatment plan. The management also emphasizes the importance of not talking money with the clinical organization in order to avoid potential problems of misunderstanding.

> When in management level, we have both angles for quality and costs ... but in operational level, we focus on quality of healthcare and concern about the suffering of the patients … For example, don't say costs are too high which is not understandable, doctors just think we ask for more money, you could say we have to shorten the time for treatment or we can't get the nurses needed, so the language is understandable. (Divisional manager)

During the decision-making process and relevant information transfer process, some clinicians in Halland realize the link between costs and healthcare quality similarly to how the management understands it, and they understand that saving resources can help provide better care overall. The management, however, is not inclined to disseminate such value and financial awareness directly when making communication with clinical organizations especially in the step 9 of the decision-making process (see figure 2). Therefore, such economic logic arises just automatically and naturally without any resistance.

Therefore, Key features of the facilitators' function included close and continuous dialogue to make clinicians understand and believe every management decision is aimed to improve medical quality instead of economic benefit and let clinical organizations accept and follow the management instructions to adjust their medical behavior. Such kind of interaction between different groups can assist in the development of shared norms and values, thereby fostering coordination across organizational boundaries.

It is also important that facilitators deliberately create sufficient autonomy and decision space for doctors and nurses in their daily work to intentionally buffer doctors and nurses from the direct effects of the PEC system and financial awareness for management level. All decision-making and framework built on the patient-centered value and organizational culture, we observed how medical logics remained intact as for instance patient treatment outcome clearly still mattered significantly to clinicians, as well as maintaining their clinical freedom, which let the clinical departments continue to do what they wanted most – that is, treating patients who are ready to be treated and thus, in practice, there was little day-to-day change for doctors and nurses at the patient level.

Therefore, even when the management level essentially increases the accounting control in the clinical department and indirectly makes clinicians change their treatment decisions to achieve the goal of reducing cost. Clinical organizations will not disagree and struggle and are willing to follow management instructions since they are communicated in their terms, appealing to the main medical goals, creating space for the continuation and coexistence of different logics which also strengthens the relations 3 in the impact cycle.

5.3.3. Institutional professional resistance from accountants

While a lot of consideration has focused on how the accountants facilitate the process, their role is not automatically supportive of change, and they present a force that also influences how the PEC is utilized. One of the key utilities of PEC being allowing for

better conversations regarding resource utilization, the acceptance of the accountants, or lack of it, impacts how these conversations and decision-making processes happen. Many accountants tend to work according to the old paradigm of annual budgeting, where decisions over the budgets are struggled over, most people aiming to get the most they can. If a new system threatens this, the willingness of the accountants to utilize the new system is reduced. The institutionalized process thus imposes conservatism to the full implementation of the PEC, which has also been recognized by some controllers in the finance function as a more significant resistance than that of the medical professionals.

Relatedly, the budgeting framework is also partly imposed by public management and its budgeting process which also plays a role in the management of RH, as the funding for the region is determined through annual budgets. Thus, while the PEC could guide resource allocation more regularly, it is difficult to work around that system. More frequent decision-making utilizing PEC to its full effect is thus made difficult by the institutional reliance on the annual budgeting process.

5.4. Accounting change for the PEC system

Based on the impact cycle we could conclude that Halland experienced the second level of accounting change that the mechanism and theory of the PEC system influence different groups of people in Halland through various ways and indirectly change the management's thinking mode as well as clinical behaviors. All The three stages could be seen as an evaluation accounting change process based on classification of Laughlin (1991), being different from the *colonization* pathway which describes the situation that the new accounting system not only directly changes the tangible elements such as organizational structure, processes of operation communication, but also the core value systems, thereby altering fundamental assumptions about why events happen as they do and how people should react, which could easily cause the resistance and dissatisfaction of some stakeholders, especially in the hospital environment, the conflict of rights and objectives between clinicians and management often leads to the deadlock of accounting reform. The evolution pathway is a *normal* and s*oft* change process, and according to our empirical findings, we think Halland adopted the evolution pathway to achieve successful implementation of the PEC system. The PEC model does not direct changes to the intangible organizational elements such as core value, culture or mission, and even the impact on the most tangible organizational elements such as organizational structure and decision processes is limited. Instead, it provides a set of common accounting metaphors and ideas, which are first absorbed and understood by the management and then gradually permeated into the daily work of the clinical organization, through communication that does not, however, use the language of accounting. Instead, the management attempts to link the same idea to the communication of operational messages by focusing the attention of clinicians on time use in healthcare, which implicitly has cost implications, without explicitly focusing the message on the accounting figures.

6. Discussion

In recent years the global economic and financial crisis in Sweden has heavily affected the medical institutions, which causes increasing pressure on cost control and resources constraints. Moreover, old cost measurement system tools argued that they are unable to face this challenge because of their inability to provide detailed and insightful cost information and to make clearer the reasons for costs sustainment. In this context, this paper investigated the whole process of introducing a new accounting cost measurement system called patient encounter costing system in Halland region and divide this process into three stages: design, implementation and utilization, and analyze it according to an adapted Zbaracki's (1998) framework to analyze how the Halland develop the PEC system to provide a transparent and accurate representation of the reasons for cost and to support healthcare departments in managing efficiently limited resources despite the increasing medical demand.

The results of the case analysis reveal that the Halland's accounting change went through an evaluation accounting change pathway, with impact for the group of members of the management and the group of professionals of clinical organization. The results of the study indicate that new cost measurement system has been effectively installed and accepted and converted into new guidance of making analysis and decisions to increase the value of healthcare in Halland. The results of the study reveal that the management group led the whole accounting change process and took proactive strategy to reduce the direct impact of the PEC system on clinical level. However, the management group is highly impacted by the important concepts and understanding of the PEC system and when evaluating cost and making decisions. Despite little resistance in accepting the PEC system, in general the PEC system is successfully introduced in Halland. Of course, in each stage management uses a specific strategy to manage the potential tension.

At the beginning of the design stage, people in management level organize a project group without involvement of medical professionals in the core phase to design the PEC system which uses the framework of TDABC recently proposed by Kaplan and Anderson (2007). The PEC is a modification of time-driven activity-based costing TDABC, which is not as complex as TDABC, but instead collecting and analyzing costs for each activity in hospitals, which is hard for people to track and make statistical analysis. PEC uses easily traceable data which is already available from existing healthcare systems to calculate the cost of major healthcare services. Halland has demonstrated that the PEC system is able to identify the activities that drove the overhead and to support the identification of improvement opportunities.

Compared with TDABC, PEC did not analyze all medical activities and corresponding costs, Halland use PEC to calculate five main medical service departments according to the whole treatment process, and only determined can calculated the major medical

resources, in other words, the cost drivers for each departments and use the calculation results to estimate the capacity and utilization rate in order to help decision makers pay attention to the true cost and resource usage of each sector and thus adjust current resource allocation strategies to avoid using resources for the high-cost and inefficient medical services. Which also potentially provides a new angle of measuring medical costs when making cost control and resource allocation decisions.

However, we also find that the PEC system is not a perfect and mature system right now, being still in the process of being fully implemented in the region; It only has a limited range of applications without detailed plans for future expansion.

After completing suitable cost measurement system with data integration, management need to consider how to implement this system smoothly and they still choice to control everything in management level instead of organizing the cross-functional group during the implementation process as the previous literatures suggested for two reasons, first of all it's not necessary to invite medical professional to join in the process, in some respects, the PEC system is just a replacement of old cost calculation model which should not cause too much change in the organization. Second, there is evidence that integrating professionals into management groups might create the potential for a *clash of cultures* when most medical professionals in Halland has no financial background (Preston, 1992). Halland's management want to carefully handle the implementation and utilization of the PEC system to avoid clinicians' resistance while also stimulate the use of cost information as well as to ensure smooth accounting change. Managements hope that the PEC system will reduce its direct impact in a way that will reduce opposition to the accounting changes within the whole organization, So the PEC system is fully controlled and managed by people in the management level of Halland, and most doctors don't know any details about the PEC system, and while some doctors could reach part of data source from the PEC system, even this part of medical professionals hardly ever uses the information from the system. The involved senior organizational managers use communication as a powerful tool for to build shared value and emphasize common values indicating that accepting the PEC system is beneficial for the development of the organization because it could provide more accurate data to help hospital improve healthcare quality for patient, which is also the goal of the medical professionals.

Therefore, top management facilitates a common organizational vision based on shared values (Dunphy & Stace, 1988) and sustains the accounting change from the PEC system. The top management commitment is identified as an important driver of accounting change in our case study. The management does not introduce mechanism and theory of the PEC system to medical professionals in order to create space and distance with financial and cost issues for clinical organizations. All these control strategies build the foundation of impact cycle as well as lay the basis for the next stage of utilization.

Under the guidance of PEC system, management find some medical services with high cost and low efficiency is the culprits of high cost of patients, for example the hospitalization of congestive heart failure patients (Yasin et al., 2020), so in the utilization stage, the management make the cost control and resource allocation decisions for example, to have fewer hospitalizations in clinical department. However, they face the challenges of effective implementation of these decisions. One obvious question for implementing this decision is that there is decoupling between the medical professionals and economic logics/financial awareness. Most clinicians do not know or understand the porter's value or the theory of the PEC system as the management do and do not want to take cost factors into consideration when making treatment decisions, since, in order to defend their own autonomy, clinicians don't want their treatment actions to be controlled by the management level, which could lead to potential resistance and failure of decision implementation .

In Halland, the view of management in Halland is that the implementation of management decisions is not at the expense of an individual's commitment to the values and goals of the profession. Their attitude is that administrators could understand medical arguments and link them to the content of decisions and make explanations to doctors rather than making doctors learn the financial knowledge to understand why management makes such decisions. Controllers and doctors have a critical role in implementing management decisions in clinical organization, who build a bridge between management and clinical groups and thereby facilitate cross-groups coordination. On the one hand, they show that goals of management and those of the profession are compatible, doing everything for the benefit of the patients, and therefore, the achievement of the goals of the management are compatible with fulfillment of individuals' professional goals. On the other hand, they encourage medical professionals to maintain their professional orientation and allow them to act *in accordance with their professional judgement* and *rely on the informal controls associated with professional membership* (Aranya & Ferris, 1994).

Our case exploration also exposed that teamwork and composition in the organization is the key factor for successful accounting change (i.e. implementation of a new system). This concern in the hospital is linked with trust. Which means management need the establishment of organizational trust/ relationship with other hospital staff during the accounting reform process and therefore, however, the combination of a medical resistance to managerialism and the medical establishment's traditional codes of practice in clinical organization is a major obstacle to bringing medical professionals and management together (Chua, 1995; Coombs, 1987; Ezzamel & Willmot, 1993; Preston, 1992). Through a comprehensive review of previous literatures, we find most cases suggest management could seek to draw clinicians into the active management of financial resources at the hospital combined with implementing socialization and training policies to encourage professionals to forego some of the expectations of the medical professional role and accept the economic logics, in other word, integrate medical

professionals into bureaucratic systems, for example, let clinicians design the new accounting system with management together, study the financial knowledge as well as take the financial responsibility such as control cost in clinical department to manage or reduce tension between clinicians and management level during the accounting change process (Abernethy & Stoelwinder, 1995; Eldenburg et al., 2010).

However, in Halland, use communication from top management and facilitators (i.e. controller and accountant) as the replacement to achieve the same effect, Through the communication, management encourage medical professionals in clinical organization to maintain their professional orientation and keep direct financial change and cost control issues far from their daily work to ensure that they are able to act in accordance with their professional judgement without control from management level (Robbins, 2007), which essentially reinforced managerial economic objectives but also concurrently maintained a degree of clinical freedom (Bourn & Ezzamel, 1986) by integrate the management into clinical groups and emphasized the importance of creation of an appropriate organizational culture where values and goals in both management and clinical level are essentially the same. Indeed, professionals may perceive that the best way to achieve their own goals is to follow the instructions from management.

7. Conclusion

This study set out to examine the management of the various pressures faced during the implementation process of a new cost accounting system, by examining the implementation of a simplified TDABC (Kaplan & Anderson, 2004, 2007) system in Region Halland. The process of implementation has been documented to be subject to various considerations, from technical ones, such as the having the necessary data and resources, to having top management support, as well as acceptance of other professional groups (Shields & Young, 1989). To shed light into how the process of implementation is conducted, and the arising tensions managed, this paper asked attempted to answer the research question: *How does the finance function manage the influence of professional groups in the implementation process of a costing system?*

Our main finding was that communication plays a major role how finance function and the management more generally attempt to make the new costing model acceptable to the medical organization. In Region Halland, this is mainly seen as a change in the language of the information and the decisions derived from it, by all the accounting information being transformed into language of the medical professionals by drawing onto patient groups, their care, and operationally relevant variables, such as bed-days or personnel-hours, instead of focusing on costs per unit or other medically abstract concepts. This is facilitated by the finance function and the PEC model by costing activities in terms of key resources (i.e. bed-days and personnel-hours), aiding the management's transformation of the information.

Contributing to the literature, these findings highlight an alternative solution to accountingization of the medical profession (Kurunmäki et al., 2003), as Region Halland maintains the long-held medical-management decoupling and does not closely involve the medical professional to the use of the costing system, opting to translate the information derived from it to the medical language instead, and giving the medical professionals space for their medical logics and management of their own care decisions. This decoupling of accounting information and medical practice is accompanied by a push to provide the care in as efficient manner as possible in the region, by focusing on the philosophy of minimizing the time the patients stay in hospital, which the management communicates as both a measure to improve patients' care quality by avoiding unnecessary stays, as well as being an implicit focus on reducing resource usage, and thus the cost of providing care.

By not resorting to tougher top-down management practices to create cost control in Region Halland, the management of the region avoids resistance against the new costing model by emphasizing the trust in the medical organization to conduct itself. This process is facilitated by the accountants and controllers who facilitate the utilization of operationally driven KPIs to in managing the care organization instead.

From a practical perspective, we hope our study can give organizations in complex environments some inspiration about how to successfully introduce a new accounting system with a smooth changing process. However, there are limits to the generalization of our study. First, our paper offers only one example of the implementation of the accounting system processes within a certain situation and department to which we had access. Our findings are not necessarily generalizable for different kinds of accounting change, nor for different kinds of medical institutions.

Based on the findings of this paper, we also suggest the future research to examine how the complexity of a new costing system impacts the tensions and resistance during the implementation, and whether there is a significant difference in the tensions between the implementation of simplified and full-fledged TDABC systems. Relatedly further investigation is warranted by the difference of these simplified and full-fledged TDABC systems in providing information, and how the differing depth of information impacts the use of the cost information and its communication. In addition, we propose for future research to assess the relationship between characteristics of accounting change and the effectiveness of management communication to see how effective different management communication strategies are in handling conflict related to the implementation of costing systems, or broader management control systems.

From the institutional perspective, an intriguing issue is also posed by how the implementation process of costing system is impacted by different institutional pressures, particularly if the accounting change is a result of regulatory changes instead of best practice mimicking and professional expertise, or if the management's communication efforts would be significantly impacted by this difference in setting.

8. Appendices

8.1. Appendix A: Interviews

Interviewee title	Date	Length of interview
Strategy developer	14-Feb-2020	30 min
Divisional Manager	12-Mar-2020	85 min
Controller A	12-Mar-2020	105 min
Doctor	13-Mar-2020	80 min
CFO	2-April-2020	70 min
CFO	8-April-2020	80 min
Controller B	8-April-2020	40 min
Divisional Manager	22-April-2020	45 min
Controller A	4-May-2020	55 min
Controller C	11-May-2020	30 min

8.2. Appendix B: Internal documents

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