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MANAGEMENT
ACCOUNTING CHANGE
IN PUBLIC HEALTH CARE

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CHANGE IN PUBLIC HEALTH CARE**

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Abstract

The aim of this dissertation is to analyse the process of change in management accounting in public-sector health care. The change is examined through the implementation of a nationally homogeneous Diagnosis Related Grouping (DRG) system. The DRG system is used to classify health-care diagnoses into groups for service productisation and pricing. The system has been proposed as a solution for cost accounting and budgeting. The practical motivation of the dissertation is to analyse the embedding of change in organisations' practises. The theoretical motivation of the dissertation is to extend the investigation of change by analysing the process of implementation of a nationally homogeneous system.

The research data comprise 39 interviews conducted between 2006 and 2011 with hospital district representatives, the representatives of the company managing the DRG system, the DRG system supplier, and the representatives of the National Institute for Health and Welfare and the Association of Finnish Local and Regional Authorities. In addition to interviews, the data consists of participative observations, telephone inquiries, and newspaper articles. This dissertation consists of four essays that analyse the data through the lens of two theories: the Actor Network (ANT) and Institutional theory (NIS).

The results indicate how the use of multiple theories (ANT ja NIS) as a methodology enriches and extends the insight into the change process in management accounting. For instance, the analysis of the homogeneous use of the DRG system, without investigating the practices of actors by making use of the ANT, the results could have been different in this respect. Especially, this dissertation indicates how important it is that actors' actions are also examined in the processes of change in the implementation of public-sector management accounting systems. The idea for the DRG system was introduced to Finland almost twenty years ago. However, the results indicate that it has spread very slowly. According to earlier research, an institutional environment is considered to exercise pressure on organisations in order to make them adopt new practices that are homogeneous with other institutional practices. There is indirect pressure in decentralised health care in Finland, though its power for change is weak. This dissertation shows how the decentralisation of responsibilities in large-scale institutions, such as the health-care system in Finland, also slows down and decentralises reforms. As institutional power becomes weaker, the power of organisations to promote things seems to grow stronger, however.

Keywords: actor network theory (ANT), cost accounting, DRG, management accounting change, national harmonization, new institutional theory (NIS), public health care

Kantola, Hannele, Johdon laskentatoimen muutos julkisessa terveydenhoidossa.

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Tiivistelmä

Tämän väitöskirjatyön tarkoituksena on analysoida johdon laskentatoimen muutosprosessia julkisen sektorin terveydenhoidossa. Muutosta tarkastellaan kansallisesti yhtenäisen diagnoosiperustaisen ryhmittelyjärjestelmän (Diagnosis Related Grouping, DRG) käyttöönottoprosessin kautta. DRG on järjestelmä, jossa luokitellaan terveydenhoidon diagnoosit ryhmiin palvelujen tuotteistusta ja hinnoittelua varten. Järjestelmää on esitetty ratkaisuna kustannuslaskentaan ja budjetointiin. Väitöskirjatyön käytännön motivaationa on analysoida muutoksen asettamista organisaatioiden käytäntöihin. Väitöskirjatyön teoreettisena motivaationa on laajentaa muutos-tutkimusta tarkastelemalla kansallisesti yhtenäisen järjestelmän käyttöönottoa.

Tutkimuksen aineisto koostuu 39 haastattelusta, joita on kerätty vuosien 2006 ja 2011 välillä. Tutkimuksessa on haastateltu sairaanhoitopiirien henkilökuntaa, DRG-järjestelmän hallinnoivan yhtiön edustajia, järjestelmän toimittajaa, Terveyden ja hyvinvoinnin laitoksen sekä Kuntaliiton edustajia. Aineisto sisältää haastattelujen lisäksi osallistuvaa havainnointia, puhelinkyselyjä sekä lehtiartikkeleita. Tämä väitöskirjatyö koostuu neljästä esseestä, joissa analysoidaan aineistoa kahden eri teorian, toimijaverkostoteorian (ANT) ja institutionaalisen teorian (NIS), avulla.

Tulokset tuovat esille, kuinka kahden teorian (ANT ja NIS) metodologinen käyttö rikastuttaa ja laajentaa näkemystä johdon laskentatoimen muutosprosessista. Esimerkiksi analysoitaessa DRG-järjestelmän yhtenäistä käyttöä tutkimatta toimijoiden toimintaa toimijaverkostoteoriaa hyödyntäen, tulokset voisivat tältä osin olla erilaiset. Erityisesti tämä väitöskirjatyö osoittaa, kuinka tärkeää julkisen sektorin johdon laskentajärjestelmien käyttöönoton muutosprosessia tutkittaessa on tutkia myös toimijoiden toimintaa. Idea DRG-järjestelmästä esitettiin Suomessa melkein kaksikymmentä vuotta sitten. Tulokset osoittavat kuitenkin, että sen leviäminen on ollut hyvin hidasta. Aikaisempien tutkimusten mukaan institutionaalisen ympäristön katsotaan painostavan organisaatioita, jotta ne ottaisivat käyttöön uusia menetelmiä, jotka ovat yhdenmukaiset muiden institutionaalisten käytänteiden kanssa. Suomen hajautetussa terveydenhoidossa esitetään epäsuoraa painetta, mutta sen voima muutokseen ei ole vahva. Väitöskirjatyö tuo esille miten suurien instituutioiden, kuten Suomen terveydenhoidon, vastuun hajautuessa myös reformit hidastuvat ja hajautuvat. Institutionaalisten voimien heikentyessä organisaatioiden voimaa ajaa asioita näyttää kuitenkin vahvistuvan.

Asiasanat: DRG, johdon laskentatoimen muutos, julkinen terveydenhoito, kansallinen yhtenäistäminen, kustannuslaskenta, toimijaverkostoteoria (ANT), uusi institutionaalinen teoria (NIS)

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List of original essays

The dissertation is based on the introductory chapter and the following essays, which are referred throughout the text by their Roman numerals:

- I Kantola H (2014) Creating an Identity for a Heterogeneous System in Health Care. The article is forthcoming in *Qualitative Research in Accounting and Management*.
- II Kantola H (2014) Harmonization of Management Accounting in Health Care. The article is forthcoming in *Journal of Accounting & Organizational Change*, 10(3).
- III Kantola H & Järvinen J (2012) Analysing the Institutional Logic of late DRG adopters. *Financial Accountability & Management*, 28(3): 0267–4424.
- IV Kantola H (2013) Role of Management Accounting in a Decentralized Public Health Care. Manuscript.

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1 Introduction

Providers of public health-care services in Finland have various obligations. For the moment Finland is divided into 20 hospital districts that are responsible for regional specialised health care, outpatient services, disaster response capacity, other official duties, and the duties in their areas of special responsibility. There are currently 320 municipalities in Finland. According to Section 3(1) of the Act on Specialised Medical Care each of these municipalities must be part of a joint municipal authority through which they are also the owners of the hospital districts. However, the municipalities and hospital districts are separate in that they assess and plan their budgets separately. As a result, the municipalities are involved in hospital district operations both as customers and owners. Therefore, the municipalities as customers pay the costs incurred by the hospital district but are not involved in its planning and operation. The services provided by the hospital districts are currently based on a break-even cost principle. This principle means that the service provider does not generate profit but charges a price to the customer that matches the production costs.

Major changes have taken place in the public health-care sector of Finland over the last twenty years. After the state subsidy reform of 1993, the responsibility for health-care costs shifted from the state to the municipalities. From the point of view of the municipalities' steering role, it was important then that the specialised hospitals should adopt a more accurate service production and pricing system. Invoicing had been based on hospital-specific patient days; but this method was given up altogether, and hospitals were given more freedom to choose the invoicing model they wanted to use. Different hospital districts adopted various accounting methods and systems. The first hospital district adopted the DRG in 1997. The Ministry of Social Affairs and Health later appointed two administrators to analyse hospital invoicing. According to the survey, the comparison of prices between hospital districts was difficult because the production and pricing criteria varied according to the hospital district. Based on this finding, the administrators recommended that all hospital districts should change to DRG pricing at the beginning of 2005. (Punkari & Kaitokari, 2003).

Earlier research points out how innovation, such as the DRG, can be seen not only as an organization's accounting method (Quattrone & Hopper, 2001) but also as a visual presentation and a means of contact and practice (Quattrone, 2009). In the process of interaction between the actors, the allies determine their preferred goals over other goals (Chua, 1995) and the new system in part determines what

information is collected, produced, and utilized in the organization in the future. The system also determines how this process is implemented, which influences the behaviour of the users of the system and the management of the organisation (Dillard et al., 2005). The system itself provides a framework that in turn affects the operation, follow-up, and steering. Thus, the adoption of a new system means adaptation, which is the result of the attempts to establish the system jointly (Preston et al., 1992).

Earlier research also points out how a highly institutionalised environment exerts major pressures on organisations to adopt practices that are homogeneous with the environment (Greening and Gray, 1994). Later research also indicates diverse approaches and controversies, which show in the public sector reform (Lapsley, 2009). Therefore, we must choose from controversial alternatives and the results can then be random. According to earlier research, giving up the accounting system and choosing the DRG instead was controversial, especially when presenting the DRG as the only right system (Järvinen 2009). The reform can thus also be seen as inconsistent, which means that the question is not of a logical managerial discourse but perhaps of an internally controversial one (Lapsley, 2009). This analysis of the implementation of accounting systems through different theories shows how the ANT, by implementing an accounting system technique such as ABC, is more heterogeneous than the NIS as a strategic actor, as suggested by the recent research (Hopper & Major, 2007). The research shows that the NIS perspective in the analysis of the data broadly focuses on external pressure and constraints, whereas the ANT perspective helps researchers focus on actors who change and their relations with the subject of the investigated case city (Modell, 2009). Modell introduces the idea of possible compatibility between the ANT and NIS theories. Therefore, although Hopper and Major (2007) and Rautiainen and Scapens (2013) claim that if neither theory provides a satisfactory explanation, combining them may enable this dissertation to explain the change in accounting, especially the direction of the change. The purpose of this dissertation is to investigate through these two theories (NIS and ANT), using theory triangulations as a methodology, how the national homogeneous system adoption was embedded in organisations' practises in order to extend the investigation of change.

At the beginning of the research project, the observation of the ambivalence of the DRG concept directed the research to the various perspectives of management accounting. All the essays investigate the DRG as an information system for management accounting and emphasise different aspects of how the

DRG shows in the process of change. Management accounting perspectives, the correspondence of the essays with the change, and the theories used in the essays are indicated in Table 1 below.

Table 1. What does one talk about when talking about the DRG.

Essay	DRG investigation viewpoint and theory	Correspondence to the change
I	As a productisation and cost reporting for the system (ANT)	how different meanings are presented for the DRG at different times. The nature of the system as a metaphor between the actors in the process of change.
II	A nationally homogeneous productisation and pricing system (ANT)	actors' operations by monitoring how the change is managed as the DRG –system diffuses and is adopted.
III	As a decision-making mechanism and control system (NIS)	why the DRG system was implemented at different times and special attention is paid to the late adopters
IV	For measuring efficiency (NIS)	why the DRG system, which was to provide efficiency, was in the end put to another use.

The *first* essay investigates the process of change in the deployment of the DRG system as an interactive information process between different parties. Attention is paid to how the actors present the accounting method at different times and how these presentations are related to the technical artefacts of social interpretation. The *second* essay investigates the national deployment of the DRG and the mutual interaction between the actors in the process of change. More specific attention is paid here to how the organisation seeks to standardise the DRG-based method and how the change was managed. The *third* essay discusses the way in which the DRG was finally selected and adopted in specialised medical care in Finland. These decisions were interpreted over management control systems through different institutional logics. The *fourth* essay investigates why the DRG system, which was created in order to provide efficiency information, was ultimately put to another use.

The whole dissertation views the process of change through the lenses of the ANT and the NIS by using theory triangulations as a methodology when analysing the data from a variety of viewpoints (cf. Rautiainen & Scapens, 2013). The dissertation contributes to the earlier literature on management accounting by investigating how the change, a nationally homogeneous system, was embedded

in organisations' practices and in order to extend the investigation of change (Rautiainen & Scapens, 2013).

The remainder of the introductory chapter is organised as follows. The literature on the change in management accounting in specialised health care is presented in Section 2. Section 3 focuses on the adoption of the accounting system and the control of the change. The research design, including the research questions, theoretical underpinnings, methodology, and the contributions of the dissertation, is presented in Section 4. The main results of each essay are reported and their wider implications discussed in Section 5, which also concludes the dissertation.

2 Management Accounting Change in Specialised Health Care

2.1 Management Accounting Change

The concept of change has been investigated extensively since Hopwood (1987) pointed out that very little was known about the concept. For instance, detailed case studies have investigated the general patterns of change in accounting: the drivers of change, resistance, and the actions of defenders and influential representatives in the process of change (Briers and Chua, 2001; Chua, 1995; Dent, 1991). Recently, Quattrone & Hopper (2001) also point to how little the actual concept of change has been discussed in the research. The research usually assumes that change is engineered, that it involves the shift in the state of presence to another, and that the old and new states of presence can be determined. However, the research shows that change is not linear (Quattrone & Hopper, 2001) nor is it predictive (Baxter & Chua, 2003). Further, the research considers the adoption of the technology behind a new accounting system is not due to pressures to conform or processes but often to a complex chain of events (Hopper & Major, 2007). The continuous growth in health-care costs and the ever diminishing resources available in the near future have moved the public sector towards efficiency requirements that in turn have created opportunities for the use of political power (Lapsley, 2008). In Finland, the public sector's financial responsibility was decentralised in an attempt to ensure efficiency. Finnish health-care expenditures amounted to EUR 17,052 million in 2011, of which public financing made up 75.5%. More than half of municipal financing is invested in health-care costs (52%), and half of municipal revenue consists of taxes (45%) (Primary service budget / Association of Finnish Local and Regional Authorities). Consequently, efficiency was sought through systems and methods used in the private sector. The DRG is an example of a system that was originally developed in the United States for use in the private sector. The research shows that governments are often disappointed with private-sector methods because of overly ambitious goals that may be unrealistic (Lapsley, 2009).

Oliver (1991) was the first to present various strategies that organisations can draw on when they encounter pressures. When two hospitals face similar pressures, each might react to the pressure differently because their strategies may be very different. In their investigation based on Oliver's research, Abernethy and

Chua (1996) introduce the concept of strategic choice. This choice means that organisations do not simply accept institutional pressures but also come up with different strategies to react to these pressures. They also adopt the concept of active agency. These results also introduce a different perspective to innovation diffusion. The adoption of an innovation by an organisation is not self-evident. There are different strategies and active agencies that are connected with the adoption. Several authors argue for the role of the theoretical actor concept in the management accounting change. Carmona and Macias (2001) and Hyvönen et al (2009) refer to Oliver's (1991) idea that organisations exercise major power on strategic answers, and these answers are connected with a variety of tactics when facing the pressure exercised by the current institutional environment. In the same way, organisations in the field work actively in order to address institutional pressure that is bound to trigger change.

Lounsbury (2008) presents the trends of a new institutional theory in accounting called institutional logic. The theory of institutional logic was originally introduced in economics. The theory explains the power of rationality in connection with market forces when referring to situations in which companies have to make decisions based on limited information. When there is little information available, decision-making mechanisms can be very different from a situation in which ample information is available. On the other hand, decision-makers may differ in terms of their background and points of departure. They develop different types of mental structures and in part group behind these. Thus, in a sense, a change in accounting also involves competing institutional logics in which different types of institutional actors group behind different logics. At some point a particular institutional logic gains domination and perhaps attracts the greatest number of supporters after which the management accounting change is possible.

2.2 Diagnosis-Related Grouping System

The process of change investigated in this dissertation is related to the adoption of a health-care accounting and information system (DRG) in hospital districts. The DRG system divides health-care diagnoses into groups and was presented as a solution to hospital invoicing, cost accounting and budgeting. The process of adopting the system in specialised health care in Finland has lasted for almost twenty years. The adoption of the system is voluntary, and pressures to adopt it are not based on law, statutes, or other rules. The provision of services in hospital

districts is based on the break-even cost principle. This principle means that the service provider does not generate profit but charges the municipalities a break-even price. The DRG system facilitates the budgeting of health expenses by standardising product specifications and calculating service costs beforehand, thereby also facilitating comparison between hospital districts. The earlier research in accounting, based on Finnish data, indicates an opportunity for pricing and case-mix accounting and discusses the successful adoption of the system (Lehtonen, 2007).

The findings of international research indicate that the DRG implementation process differs according to country, such as in the United States, Australia, and the United Kingdom (Fetter and Freeman, 1986; Borden, 1988; Chua and Degelin, 1991). Earlier research has considered the DRG system as a solution contributing to cost efficiency, the containment of costs, comparability and the reform of financial management (Chua and Degeling, 1991; Doolin, 1999, Järvinen, 2009; Lawrence et al. 1994; Lehtonen, 2007). From an accounting point of view, the system has thus been linked with many types of issues. However, the research also points out how the various goals have changed in the course of the process. Lowe (2001) suggests that in New Zealand the original goals of the DRG system were patient classification and quality control. These goals were quickly replaced by cost control and compulsory funding. Chua (1995) also indicates that organisations have re-framed the DRG system using financial terms that have had a major impact on replacing costs with other viewpoints such as the opportunity to use the system in health care and the most important objectives of hospitals. In research on the interaction of the actor network, Chua (1995) shows that with regard to the adoption of the DRG system, the need for a DRG-based accounting and information system can also be generated by experts. Thus, the question is of a system that is used worldwide but whose use differs according to the country, and perhaps even changes along the way.

In almost all the countries using the DRG, the receiving of money by the hospital is somehow related with the DRG. In the U.K. for instance, national prices have been defined (Llewellyn and Northcott, 2005). The role of the service provider is to organise care so that the risk of losses can be reduced. In the decentralised health-care system used in Finland, hospital districts can be regarded as highly independent in international terms. The pricelist is used as the invoicing instrument in the negotiations between municipalities and hospital districts. The municipalities as clients cover the costs incurred by the hospital districts. The DRG does not include any profit but is based on customer-specific

costs, which means that costs are allocated and invoiced to municipalities on the basis of these costs. Formerly, most of the costs in hospital districts were divided and invoiced as a lump sum to the municipalities on a per capita basis. In this respect, the DRG system has improved the accuracy of cost accounting. It should be noted that the allocation of costs is also a social agreement as the actors agree among themselves how the costs will eventually be divided between the municipalities. The municipalities as owners also want the new system to improve comparability.

To allow exact comparison, the DRG should be capable of standardising treatment periods. There are three hospital levels in Finland, and the costs of comparing the same medical operations can be different, and it is therefore difficult to compare the costs of different operations. Some hospitals have specific obligations, such as those connected with providing outpatient services and maintaining other capabilities, which in turn increase costs. Some of them have a lot of costs of this kind, while some do not have them at all. In addition, it is usually the university hospitals that have to deal with the most severe cases or have agreed to do so, and it is difficult to eliminate these in the structure of the pricelist. The above means that even if the medical operation was the same, it might be priced differently. There are also other factors, such as basic capital interest payments, which some charge to outsiders and some do not and whose effect on prices can be a large percentage. The DRG pricing is thus based on grouping, not directly on standardised product-specific pricing.

Municipalities in Finland pay health-care invoices according to actual costs, not based on the standard DRG price or, for example, a previously defined price as in the United Kingdom. For instance, there is no central management in Finland that determines the prices of medical operations, but each hospital district invoices them on the basis of actual costs and the agreement negotiated with the municipality (Hyvönen & Järvinen, 2006). It has been impossible to present any proof of the superiority of the DRG over other systems, as superiority here depends on the viewpoint, that is, whether the issue is viewed from the point of view of a municipal decision maker or those in charge of a hospital. According to the data in Finland, the DRG has been used more as a means of developing internal operations and for comparison purposes, that is, more as a control tool than a financing instrument. However, there is no confidence in the comparative information provided by the DRG, so it is not used to support management decision making. However, according to research results, it rather serves as a contractual instrument between municipalities and hospital districts. The DRG is

incapable of measuring efficiency either, but the aim of the municipal sector is to use the system as a means of obtaining cost information on the services it has purchased and to ensure that homogeneity between different municipalities has been achieved. More extensive cost information can be considered to benefit both parties – municipalities and hospital districts.

3 Adoption of the Accounting System and Control of Change

3.1 Construction of the Accounting System

The research shows that innovations are adaptive (Czarniawska & Sevón, 2005) and can be applied to different types of social worlds (Star & Griesemer, 1989). The accounting system can also be perceived in different ways (Quattrone & Hopper, 2001; Quattrone, 2009). Once allies are persuaded to adopt the system, they can change the system to suit a completely new, different purpose. The coherent adoption of a new system calls for operational control (Latour, 1987). In the process of interaction between the actors, the allies determine their preferred goals (Chua, 1995) to direct the process in order to make it predictable (Lowe, 2000) so as to ensure that the accounting system is not changed from the original purpose. Thus, the adoption of a new system means an adaptation that is the result of attempts to establish the system jointly (Preston et al., 1992).

A new accounting system is not only a self-evident unchanging structure that is implemented, but also part of an actor network that interacts with other actors so that the system is approved and integrated into the network. In the process of change the system is presented to different people (Briers & Chua, 2001) and thus made real (Bloomfield & Vurdubakis, 1997). At the same time, the network shapes the national system according to its operational requirements. The existence of information systems alone does not construct behaviour, but the existence of the social sphere does shape the construction of the system. Representation is considered important in the process of turning ideas into reality (Bloomfield & Vurdubakis, 1997; Quattrone & Hopper, 2001). Earlier research has underlined its connection with the organization and the communication (Carruthers, 1998) and in this way, accounting can be adapted to meet the needs of its users (Quattrone, 2009).

Earlier research has investigated the diffusion of a new system and its early adopters by looking at the effect of the company's size and the diversity of the system on the adoption of the management accounting system (Bright et al., 1992; Drury & Tayles, 1994; Innes & Mitchell, 1995). There is also research on how the first adopters implement the new accounting system successfully (e.g. Lehtonen, 2007). This research emphasises the need to investigate change over time (Hopper

& Major, 2007) that makes it equally important to look adoption in different stages alike.

According to the administrator report conducted by Punkari and Kaitokari (2003), hospital invoicing systems should ensure quality and fairness between municipalities. They suggest that specialised medical care should adopt the DRG from the beginning of 2005. The idea behind the DRG reform was that municipalities should be able to budget their social and health expenditures better by standardising product specifications and by more accurate accounting beforehand on the basis of service costs and to compare the hospital district with other districts. This concept meant abandoning the existing cost systems and establishing a new system for mutual comparison (Järvinen, 2009). To ensure more accurate comparability and better availability of cost information, one method was sought that could promote these attempts, and the result was the DRG system. The Association of Finnish Local and Regional Authorities and the ministry issued a recommendation for the implementation of the DRG system as the basis for municipal invoicing.

3.2 Control of Change

Earlier ANT-based research has brought to the fore how a network object can also be fluid, in which case the object can be constructed in different ways (De Laet & Mol, 2000). The same object can be used successfully for some purposes but not necessarily for all. It may work well for one actor but fail to unite all of the actors. Similarly, the object may promote specific issues at some point in time but not at some other point in time. Actors make use of issues related to the object without changing its final purpose. Researchers find that it is practices rather than the object itself that determine the success of an object (Quattrone, 2004). For the adoption and construction of the accounting system, studies show how the goals set were not achieved and the object was not created (Quattrone & Hopper, 2006). And how the end point was not known beforehand but emerged during the implementation process (Hyvönen et al., 2008). Thus, the possibility exists that actors change the system for an entirely new, different purpose. Consequently the innovation adoption process is considered to require control over the actions of the allies so as to ensure, for example, that the system is adopted in a consistent manner (Latour, 1987). Those speaking in favour of the system must control the operation of the allies to make it predictable (Lowe, 2000) in order to ensure that the system and its use are not changed from the original purpose.

Control is also needed when the question is of a boundary object. A boundary object divides actors' interests but still calls for their joint action (Star & Griesemer, 1989) and is used when the key actors have shared interests in the object. The boundary object can be an accounting system (Quattrone and Hopper, 2006), such as the DRG. The DRG is used in different types of communities, such as in specialised health care, and satisfies the information needs of different actors. Boundary objects emerge through cooperation between communities and help them to adapt to abnormal situations without the need for outsiders to assign adaptation-related categories or standards. The object takes the form of a general simultaneous factor that acts on the boundary between different social worlds. When the actors from different worlds make proposals to each other, their differing dependencies and observations are reduced to the level of the proposals. Boundary objects are thus described as objects that construct the context to be dealt with jointly. Research into boundary objects has been conducted, for example, by Briers and Chua (2001) and Dechow and Mouritsen (2005).

The new accounting system can be an opportunity that offers benefits and generates new information on costs. In this sense, the system can be regarded as a single actor that participates in the operation of the organisation. The accounting system produces information for users and engages in interaction with them. It is thus necessary for the organisation to also adapt to the accounting system, that is, the organisation has to combine the system with its own actions in order to adopt the new system (Quattrone & Hopper, 2006). The adoption of the system with a view to achieving the goals and expectations set for the system guides the views on producing information. This production involves the question of whether the system will generate the information expected from it. The accounting system only becomes an object through the relations between different actors (Callon et al., 1986), which means that everything depends on the other actors, both human and non-human. Only when all of these actors act together does the object, such as an accounting system, work. According to the actor network theory, the accounting system can also be more broadly the producer of the information (Hyvönen et al., 2008; Andon et al., 2007; Quattrone & Hopper, 2005; Dechow & Mouritsen, 2005). The point of departure is that when the accounting system, or technical preconditions, is in order, then the system will produce consistent data. Inconsistency exists because as a whole, the actor network is still different from the network's social operation. The technical and social aspects interact with each other and their effectiveness can be enhanced through instructions and guidance.

The network always aspires towards stability and permanence but it needs controllability to be able to manage operation (Latour, 1987).

4 Research Design

4.1 Research Questions

The dissertation consists of four essays that focus on the implementation process of the DRG accounting and information system in public health care, which is undergoing a major change, and the specific features related to it from the point of view of management accounting. The *first* essay investigates the process of change in the implement of the DRG system as an interactive information exchange process between different parties. Attention is paid to how the actors present the accounting method at different times and how these presentations are related to the technical artefacts of social interpretation. It provides answer to the questions of why the system was selected and why it became a strong system. The *second* essay investigates the national implementation of the DRG and the mutual interaction between the actors in the process of change. More specifically, attention is here paid to how the organisation seeks to standardise the DRG-based accounting and how the change was managed (Alcouffe et al., 2009; Lowe, 2000). And what form that the accounting system takes when spreading and the type of information that it produces for the organisation and society. The *third* essay discusses the way in which the DRG was finally selected and adopted in specialised medical care in Finland. These decisions were interpreted over management control systems from the point of view of different institutional logics, the independence logic (management accounting serves hospital decision-making) and the municipal extension logic (management accounting serves the hospital's municipal owners). The reasons why the system was deployed in the field at different times are examined, and specially attention is paid to the late adopters. In the *fourth* essay, I investigate why the DRG system, which was created in order to provide efficiency information, was ultimately put to another use. A summary of the research questions is presented in Table 2.

Table 2. Research questions.

Essay	Question
I	Why was the DRG selected and why did it become a strong system?
II	What form does the accounting system take when spreading and what types of information does it produce for the organization and society?
III	How do the late adopters differ from the early adopters?
IV	Why was the DRG system, which was created in order to provide efficiency information, was in the end put to another use?

The purpose of the whole dissertation is to analyse, by using theory triangulations (NIS and ANT) as a methodology, how the national homogeneous DRG system was embedded in the organisations' practices in order to extend the investigation of change.

4.2 Theoretical underpinnings

The implementation of an accounting system is an adaptation process (Star & Griesemer, 1989; Czarniawsaka & Sevón, 2005) in which the accounting system is constructed. The accounting system is not only a self-evident unchanging structure that is to be implemented; it is constructed through a process in which it is presented to various people (Briers and Chua, 2001) before it becomes real (Bloomfield and Vurdubakis, 1997). Organisations today are considered to operate as extremely open systems, and the direction of rationality is considered to have changed so that organisations are seen as communities in which different actors have similar or differing aspirations (Scott, 2003). Therefore the theoretical discussion in this dissertation does not define the actors as fundamentally passive and adaptable to their environment. The role of human and non-human actors is taken up in the theoretical discussion. The research questions presented earlier indicate how the process of change has advanced and how the basic assumptions of the theoretical framework are used to describe interesting aspects of the subjective nature of management accounting. Therefore, all the frameworks, even those with the same basic assumptions, are shaped into different parts.

The four essays of this dissertation use theoretical guidelines already used in earlier accounting research, and broadly use (the) ANT (e.g. Hyvönen et al., 2008; Andon et al., 2007; Quattrone & Hopper, 2005; Dechow & Mouritsen, 2005) and the institutional theory of active agency (Hyvönen et al., 2009; Abernethy & Chua, 1996). These two viewpoints have converged and strengthen each other

according to recent research. Among other things, researchers have changed the concept of the imitation of rationality and the permanence of institutional rationality by focusing on the rationality instrument, bringing out the differences in motives and practices. This process introduces the new possibility of opening the institutional analysis of the imitation of rationality and permanence to an analysis of actors and practices. When examining differences between actors and practices, the new direction of this institutional theory also allows discussion of ANT (Lounsbury, 2008; Hopper & Major, 2007; Dillard et al., 2004).

Institutional theory approaches actors not by considering them as individuals but by suggesting that the actors compose a broader scale for arrangements and beliefs. In both statistical and qualitative research, data is also collected from individuals related to individuals and institutions. However, the individual is not the scientific object; the primary focus in research must be on the field and its operation (Bourdieu, 1977). This focus should be maintained even if the field consists of individuals (Lounsbury, 2008). With the multiple theory method, it is possible to look at things in more detail.

This thesis makes use of two ontologically different approaches. Essays III and IV, which are based on the institutional theory, utilize hermeneutical, interpretative research. In the hermeneutical paradigm, the object of research is real but the information derived from it is subjective. The idea in the hermeneutical approach is that the object of research is relatively stable, objective and real, but information on interesting issues related to it must be obtained through interviews and observations. The Actor Network Theory, which is utilized in Essays I and II, falls within the postmodern paradigm. Actions are investigated, which features a subjectivity approach linked with the philosophy of postmodern science (Puxty, 1998). These two research traditions have been combined in earlier accounting research by Rautiainen & Scapens (2013), Hopper & Major (2007) and Modell (2009).

4.3 Methodology

Between 1992 and 2008, Jacobs (2012) examined the use of theories in investigations by applying a wide range of theories to the complex public sector. Further, many researchers have combined theoretical approaches in order to assign more importance to complex public sector operations and to support the argumentation for theoretical pluralism. This literature on theoretical pluralism has made it possible to research change in management accounting. However,

according to Jacobs (2012), combining some theories might prove controversial and contrary. Therefore, the challenge for authors is to be more intentional in the use of the theory, to explain and to prove the use of each theoretical model, and to blend the theories into the research. The multiple theory approach has been utilised in the accounting research on the private (Vaivio, 2008; Hopper & Major, 2007; Ahrens & Chapman, 2006) and public sectors (e.g. Rautiainen & Scapens, 2013; Jacobs, 2012). Lounsbury (2008) has encouraged accounting researchers to make more extensive use of practice-based theories, such as ANT, in institutional analysis. Theory triangulations can be used as a methodology when analysing data from a variety of viewpoints (cf. Rautiainen and Scapens, 2013).

Rautiainen and Scapens (2013) agree with Jacobs (2012) in that when ANT and NIS are used together, caution is needed. According to Rautiainen and Scapens (2013), there is a danger of becoming too theoretical. Specifically, change might be easier to analyse by using either the ANT or the NIS concept because similar conclusions can be drawn from both. For instance, the authors find that the theories together can provide insights that might be useful in explaining both permanence and change. Rautiainen and Scapens (2013) introduce key concepts that include both ANT and NIS elements such as transformations, pressures and path-dependency. By utilising these concepts, they account for the change in accounting at all organisational levels.

Rautiainen and Scapens (2013) investigate the compatibility of ANT and NIS by analysing the change in accounting through public-sector case studies. Basically, Hopper and Major (2007) also make use of the two theories but at different organisational levels. Hopper and Major (2007) demonstrate how ANT shows that the adoption of accounting system technology, such as ABC, is more heterogeneous than suggested by the recent research on NIS as a strategic actor. Modell (2009) shows how the NIS perspective in the analysis of their subject city focuses largely on outside pressure and constraints; whereas the ANT perspective helps researchers to focus on actors, their change, and their relations with the subject. Modell brings to the fore the idea of the possible compatibility between the ANT and NIS theories. Thus, both Hopper and Major (2007) and Rautiainen and Scapens (2013) claim that if neither of the theories provides a satisfactory explanation, then in combination they might possibly explain the accounting change, especially the direction of the change. This dissertation also makes use of both the NIS and the ANT in order to extend the investigation of change. The various essays were analysed through different theories, but the entire dissertation

is viewed through these two lenses by using theory triangulations as a methodology when analysing the data.

The investigation into the reform of management accounting in specialised health care in the Finnish public sector entails a qualitative method. This method collects and utilises extensive data. The method then helps to describe the complex chain of adopting the accounting system and its connections (Yin, 2008). The description also answers the research questions. The research also involves utilising different types of versatile data, which were used as a source and acted as traces of events that were monitored in the course of the research process. The primary data of the whole dissertation consists of 39 interviews. The data also contains participatory observations, telephone interviews with representatives of hospital districts, and the examination of archived newspaper articles in order to supplement and confirm the information obtained through the interviews. This setting provides an interesting view of the research into the use of the DRG system.

The interviews were conducted with the key actors and took place between January 2006 and June 2011. The respondents were chosen by first verifying that they had contributed to the adoption of the system. During the interviews, the names of new people came up, some of whom were also interviewed. The selection of respondents was also affected by my participation in a DRG project meeting, the contacts established there, and the list of participants attending the meeting. The interviews were unstructured in the sense that the respondents could talk about what they knew and thought about topics important to them (Shank, 2002). The purpose of the interviews was to obtain a wide picture of the issues connected with the use and the spread of the DRG system. During the research process, interviews were conducted with the management, physicians, nurses, department secretaries and information system professionals of different hospital districts. Interviews were also conducted with people such as representatives of the company managing the system, the system supplier, actors at the organisational level, and representatives of the National Institute for Health and Welfare (THL) and the Association of Finnish Local and Regional Authorities. The interviews were recorded and transcribed, after which they were read and analysed before conducting a new interview (Atkinson and Shaffir, 1998).

The analysis of the interviews strengthened and widened the picture gained from earlier interviews. The interviews were triangulated (e.g., Seale, 1995, p. 53-61) with the help of the secondary data that was used to support the observations, and the conclusions drawn on the basis of the interviews. The same issues were

discussed later with different respondents, and some of the issues were further taken up with some respondents, thus creating a synchronic and diachronic triangulation. Wider access was also granted to one organisation, where it was possible to interview the personnel extensively. These interviews were conducted with the organisation's management, financial personnel, ward physicians and other medical personnel. All the respondents were somehow involved in matters connected with the use or control of the DRG system. These interviews also enabled me to become familiar with the use of the system and to make on-site observations. The operations of the organisation were monitored and interviews were carried out throughout the process of change from the adoption decision to the adoption of the system, and continued a couple of years after the adoption.

The participatory observations also took place at a national seminar arranged by a hospital district and the National Institute for Health and Welfare. The topic of the seminar was the productivity of health care and the planning and development work in the hospital district. The main topics of discussion were the DRG system and the related methods used by the hospital districts. Participatory observations were also conducted in a DRG development project meeting intended for the management of the hospital district. In addition, it was possible to attend DRG user events with personnel responsible for DRG issues. Written notes were made on the participatory observations. The secondary data also includes telephone interviews on the use of the system in hospital districts in order to find out how the system spread and how it was adopted. Further, the data includes newspaper articles and extracts on the decisions taken in the hospital districts. The extracts are public and are available on the Internet. All in all, a broad, rich sample of data was collected for the research. This sample allowed me to extend the research context to take into account the views of different actors on how and for what purpose the system was used and the form that it should take at the organisational level and in society.

At the beginning of the research, the DRG is an ambivalent concept. Therefore, the first essay set out to investigate the things that were proposed for the system and the concepts that were assigned to it as it spread. These preliminary results guided us to select the ANT by means of which we were able to take an in-depth look at the connections and operations of single actors. The results indicated that several different meanings were attached to the concept. The results directed me to investigate in the next paper how the DRG is used in practice and how homogeneous its use is; so the ANT offered me the opportunity to investigate and draw conclusions on the operations of single actors and

organisations. There were strong grounds for the use of the ANT at that point. Even though the actors reported that they were using the DRG, the research results illustrated how the same system was used in different ways and with different meanings in different organisations. The research indicated how important it was to investigate the practices and the operations of the actors. It also revealed results that could not have been derived through the institutional theory. The third essay investigates the strategic goals that the various institutional groups had set for the use of the system through institutional logics. It was observed that the presence of these competing logics in part delayed the implementation of the system. The fourth essay looked into the possibilities of the method to provide accurate information on costs for cost comparison purposes.

Epistemology means being aware of things, receiving information and recognising the problems involved. Researchers should think of a methodological grip, or how the topic under investigation could be best approached. Because the focus in this dissertation is on factors related to the adoption process of a management accounting system, approaching the matter is best done by interviewing the people involved in the change and by monitoring their actions. The essays describe the use made of interpretative case study methodology. The research is interpretative when the researcher interprets the matter under investigation and when the actions of the actors are investigated. A case study means that generalisations and general assumptions cannot be used to account for causes, and explanations can only be based on general, case-specific conditions. Even though the presentations are based on interviews and interview assumptions, it has endeavoured to support the findings and conclusions based on the interviews by means of interview triangulations and the extensive use of other data, which provides a relevant picture of the specific reality in the same way as subjective assumptions are based on collective understanding (Carruthers, 1995).

4.4 Contributions of the dissertation

The dissertation consists of four different essays and the essays contribute to the literature in four main respects. *Firstly*, the accounting system is not only a self-evident unchanging structure to be implemented, but part of an actor network that interacts with other actors. Implementation projects are not seen as linear stories in the sense that they have a distinct, predetermined objective that can be achieved. Instead, implementation can also be a complex process involving several actors whose interests in the object, such as the DRG system, might be

different. The nature of the system was taken up as a metaphor for the actors (Hyvönen et al., 2008) through which the process of change was investigated. In this process of change, the accounting system is presented to different people (Chua, 1995) through which the construction of the accounting information system is identified (Bloomfield & Vurdubakis, 1997). At the same time, the actors shape the national system to suit their operational requirements. The purpose for which the system was selected was investigated and also the reason why it became a stronger system. In this dissertation, a strong system refers to one that gains approval that then spreads over the network. The description of this process is the contribution this paper makes to the literature.

Secondly, because the actor network consists of human and non-human actors who interact with each other; technology, such as a new accounting system, can also be an actor in the network. Chua (1995) indicates that individual actors can arouse interest that commits other actors to the new accounting system. Once allies engage to adopt the system, they can change the system to suit a completely different purpose; and these allies may later be hard to control (Lowe, 2000). Therefore the adoption of a new system calls for operational control in order to construct the system in a coherent manner (Latour, 1987). When investigating the homogeneous and heterogeneous aspects of management accounting systems, the research shows that theoretically the actions of the members of the network ultimately determine which aspect prevails (Alcouffe *et al.*, 2008). This dissertation contributes to the earlier accounting literature by investigating issues that shape the construction of an accounting system when it disseminates throughout organisations and society (Alcouffe *et al.*, 2008) and how that change is managed (Lowe, 2000).

Thirdly, although there is already research available on how accounting changes in organisations because of the influence of the institutional field (Carruthers, 1995; Chua, 1995), we find that the subject is far from a final solution. Therefore, we open up the process of change by investigating institutional pressures and the timing of the adoption of the accounting system (Lounsbury, 2008; Hyvönen et al., 2009). The dissertation contributes to the earlier accounting literature by examining the complex process of change through the investigation of the diffusion of an innovation that results from the institutional logics assumed by the adopters of the management accounting system (Lounsbury, 2008; Ezzamel et al., 2007; Hyvönen et al., 2009) and the pressures exerted by the institutional field (Dillard et al., 2004; Hopper & Major, 2007).

Fourthly, earlier studies argue that a highly institutionalized environment is a major power that influences the organisation to adopt practices that are compatible with that environment (Greening & Gray, 1994). The implementation of a new method or system often encounters considerable opposition and might only yield marginal benefits or even fail. The investigation of the process of change is interesting to examine because of the dynamics between the triggering of a public-sector reform and how the institutional forces work in a decentralised health-care system. This contributes to the literature by describing a process of reform through which the government sought to improve the efficiency of the public health-care sector by selecting an accounting system conducive to those efforts (Lapsley, 2009; Myer & Rowan, 1997; Carruthers, 1995).

All in all the dissertation contributes to the literature on management accounting by investigating how the change, a nationally homogeneous system, was embedded in organisations' practices and extends the investigation of change (Rautiainen & Scapens, 2013).

5 Main Findings and Concluding Remarks

The *first essay* points out how the various proposals and purposes in the process of change proved important tools through which a common interest advanced to develop and improve visibility and to disseminate the DRG (Hyvönen et al., 2008). The process and the methods, presentations and representations used helped experts from different fields to understand the importance of accounting. This ensured time and space to target the adoption and approval of the accounting system (Bloomfield & Vurdubakis, 1997; Hyvönen et al., 2008). The system was presented using different arguments at different times, thus making it heterogeneous, which served to increase understanding and approval. The *second essay* in turn shows how following the actors' practices made it possible to locate and identify factors that can at least partly be considered to contribute to the similar or different adoptions of the system (Alcouffe et al. 2008). Even though the actors reported that they were using the DRG, monitoring their practices illustrated how the same system was used in different ways and for different purposes in different organisations. The variation in the use made of the method affects the original national comparability goal with the consequence that the goal has not been achieved. Among the most important factors here were differences in the practices of different actors and commitment to the consistent adoption of the method. It is important to note that if the research had focused on the technical aspect only, the results might have been different (Kantola, 2014). The *third essay* (Kantola & Järvinen, 2012) took up factors that have affected the late adoption of the DRG. The research shows that competing logics that had existed for two decades, a legislative change, and the financial change in which responsibility shifted from the state to the municipalities played an important role in balancing the competing logics. The adoption of a consistent rationality idea and even the superiority of the municipal extension logic contributed to the faster spreading of the new accounting method. The limits caused by the logics in the hospital decision-making mechanisms can be considered one of the reasons why it has taken almost twenty years to adopt and implement the DRG in Finland. The method cannot be used to measure efficiency, but the goal of the municipal sector to obtain cost information on the services it has purchased has been achieved, as indicated by the *fourth essay*. The DRG is nevertheless loosely connected with the process (Carruthers, 1995) because it does not provide information for management-level decision-making; that is, it is decoupled from hospital management, and the cost information is generated for purposes other than

decision-making aimed at organisational efficiency. In a decentralised health-care system, costs have to be considered at the points where they originate. There has been very strict local cost control because if there is no money, efficiency is already increased by the mere knowledge of what services cost.

The whole dissertation used two theories as a triangular methodology (Rautiainen & Scapens, 2013). This broad framework enables to analyse the embedding of the change in organisational practices and draw broader conclusions regarding the powers in the adoption of a national system. In light of the results of this investigation, it can be said that organisations encountered indirect pressure from other organisations that had adopted the DRG system. The organisations actively address indirect institutional pressure by adopting the DRG system, as a result of which the change was triggered (Greening and Gray, 1994). It is to be noted that the power and relevance of this institutional pressure could be indicated by investigating how the actors operated. The results indicated how the organisations reported that they used the DRG system, while a more detailed investigation of the operations of actors revealed that the system is used differently in different organisations. The analysis of the use of the DRG system, without investigating the practices of actors by making use of the ANT, the results could have been different in this respect. The dissertation shows how important is that actors' action are investigated in the processes of change in the implementation of public-sector management accounting systems.

This research also attested to the validity of the insight into the direction of the change (Rautiainen & Scapens (2013). An example of the global spreading of operative accounting over a very short period of time was earlier presented as proof of the power of ideology. The dissemination of the DRG is also related to ideology. Although the idea of the system was introduced to Finland nearly 20 years ago, the system has spread very slowly. Decentralised health care also exerts indirect pressure on organisations to adopt homogeneous methods. However, its power to bring about change is not strong. This dissertation shows how the disintegration of the responsibility for major institutions, such as the Finnish health-care system, slows down reforms and makes them scattered. No consistent institutional power of change is in sight that could forcefully push national reforms through, and this in turn slows down the adoption of new, nationally consistent methods. The power of institutions to promote reforms then weakens. This dissertation also shows how the power of organisations to promote things accumulates as institutional power declines.

In the decentralised specialized health-care system in use in Finland, the DRG mainly takes a different role than what was earlier set as the target for the DRG system. The system is used more as a base for productivity and invoicing than for purposes of national comparison or as the basis of management-level decision-making. This use indicates how important the investigation of the adoption of the invoicing method in different contexts is, and how much information is needed on the factors affecting implementation and the learning of the method. However, the concept can be transferred from one context to another, which is valuable. It is important to note how the transfer of the accounting method and its methods differ from transferring technology only. The main issue with the DRG discussed here is the grouping of the diagnoses, the cutoff point, and the DRG specification. Therefore, it is also important to remember when comparative cost information or support for management-level decision making is needed. When the method is used as a patient classification system, one can understand why it does not produce the desired results. The creation and transfer of large-scale accounting systems in organisations dealing with large-scale budgets is a financially important matter, so it is important that the public-sector accounting method, too, is investigated.

Finally, this dissertation also takes up questions that have been limited in this research and should be investigated in the future. Firstly, by extending the relevant research to health centres and regional hospitals, it gives a broader picture of the different uses of the DRG in different types of hospitals. The use of national data also enables the use of quantitative methods in investigating topics that could be generalised statistically. Secondly, this dissertation investigates the process of change over the medium to long term. Collecting data over a long period of time could allow conclusions to be drawn about the changing and unchanging elements connected with the actual process of change. In the future one could look at practices in more detail, paying attention to their origins, their connections with logics, and the path towards changes in the creation of new practices. This type of analysis could possibly introduce new elements to the existing management accounting practices in the public sector.

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Original essays

The dissertation is based on the introductory chapter and the following essays, which are referred throughout the text by their Roman numerals:

- I Kantola H (2014) Creating an Identity for a Heterogeneous System in Health Care. The article is forthcoming in *Qualitative Research in Accounting and Management*.
- II Kantola H (2014) Harmonization of Management Accounting in Health Care. The article is forthcoming in *Journal of Accounting & Organizational Change*, 10(3).
- III Kantola H & Järvinen J (2012) Analysing the Institutional Logic of late DRG adopters. *Financial Accountability & Management*, 28(3): 0267–4424.
- IV Kantola H (2013) Role of Management Accounting in a Decentralized Public Health Care. Manuscript.

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