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“DEVELOPING AND IMPLEMENTING ICT INNOVATIONS FOR EFFICIENCY,
QUALITY AND EFFECTIVENESS IN COMPLEX ORGANIZATIONS: A
COMPARATIVE ANALYSIS OF HUMAN RESOURCE INFORMATION
SYSTEMS IN HEALTHCARE”

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Executive Summary

This interdisciplinary PhD lies at the intersection of three domains: Human Resource (HR) Management, Information Systems (IS) and Health Informatics, also known as eHealth. It focuses specifically on Human Resource Information Systems (HRIS) designed for or used in health organizations. The studies described used both secondary and empirical research methods to synthesize the existing body of evidence, generate new evidence and advance current theoretical models in this area.

Study 1: A methodologically rigorous Systematic Literature Review captured, critically appraised and synthesized the existing corpus of research pertinent to HRIS. It revealed that while some studies of HRIS implementation have differentiated between expected and realized benefits, none have compared both of these in the context of healthcare, and none have compared HRIS in different healthcare systems (Tursunbayeva et al., 2016).

Study 2: The empirical studies were aimed at addressing this knowledge gap by analysing the expected and realized benefits from HRIS projects for different stakeholders within healthcare organizations in two countries. They also set out to assess to what extent identified in the systematic review sociotechnical factors of influence affected implementation and outcomes in these projects.

The empirical research followed a qualitative embedded case study design, using both documentary analysis and stakeholder interviews. Two case examples were selected for analysis - a national and a regional HRIS development and implementation programmes in two different European countries. The same commercial HRIS system was procured under public tender and deployed in both

settings. Data were analyzed within and across both cases in order to identify their commonalities and differences.

The integrated analysis identified a wide range of expected benefits that had driven both projects for different actors. There was evidence of all the categories of expected benefit identified in previous HRIS research (see Parry & Tyson, 2011), except for improving Organizational image. Uniquely the results indicate that HRIS projects can be also driven by organizations' motivations to benchmark themselves against the sector leaders and by particular requirements of the health sector (e.g. improving patient care).

The comparative analysis of the two case studies also provided clear evidence that benefits realization takes place not only during the IS implementation process, but also through its use and can be affected by a wide range of sociotechnical factors. The two case studies analyzed in this thesis also demonstrate that there are strong interdependencies both across different categories of benefit and between different actors. Importantly, the analysis also revealed the variation between benefits expected at the outset of the project compared to the outcomes realised later on.

Study 3: In order to better understand this gap, further analysis was undertaken of the processes of HRIS development and implementation that had influenced each outcome. This used an Institutional Theory lens to explore how different (possibly competing) institutional pressures had shaped the development and implementation of this "IS innovation" within these organizational settings over time. The concepts of the "organizing vision" and "strategic responses" were invoked to understand how different organizational actors had interpreted the

nature and goals of the innovation and how they had chosen to respond to the various institutional pressures associated with them.

This analysis yielded a framework for describing the process through which social context shapes organizational IS innovations over time. This framework, and the taxonomy of expected and realized benefits from HRIS, contribute meaningfully to the development of theory in this area and can inform future HRIS research. Insights and recommendations from the studies are also valuable for managers planning, delivering or evaluating HRIS development and implementation projects, which can be complex and challenging.

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Table of Contents

1. Chapter 1: Introduction	1
1.1 Aims and benefits of this research	3
1.2 Structure of the thesis	5
2. Chapter 2. Overview of HRM, HRIS and HRIS in health	8
2.1 Introduction	8
2.2 HRM: Concepts and definitions	8
2.3 HRIS: Concepts and definitions	10
2.4 HRM and HRIS: origins and developments	12
2.4.1 Beginning of 20 th century (Pre-post World War I)	12
2.4.2 Middle of 20 th century (Pre-post World War II)	14
2.4.3 End of 20 th century	14
2.4.4 Millennium and Contemporary Period	15
2.5 Health context: overview	18
2.6 HRIS in Health context: overview	19
2.7 Conclusions	21
3. Chapter 3. A critical examination of interdisciplinary literature on HRIS in health	23
3.1 Introduction	23
3.2 Review objectives	25
3.3 Systematic literature review methodology	26
3.3.1 Search strategy	26
3.3.2 Article screening and selection	28
3.3.3 Data extraction and analysis	29
3.3.4 Critical appraisal techniques	30

3.4	HRIS in Health: literature synthesis	31
3.4.1	Review results	31
3.4.2	Analysis of previous studies	48
3.5	Summary of the results.....	60
3.6	Conclusions	63
4.	Chapter 4. Conceptual framework	65
4.1	Introduction	65
4.2	HRIS benefits and factors shaping IS innovations.....	67
4.2.1	Frameworks on HRIS benefits in health settings.....	67
4.2.2	Frameworks on factors shaping the outcome of IS innovations	71
4.2.3	Summary of conceptual frameworks for HRIS benefits and factors shaping the outcome of IS innovations	72
4.3	Institutional theory: Introduction	73
4.3.1	Institutional pressures in DiMaggio and Powell (1983)	75
4.3.2	Organizational actors' strategic responses to institutional pressures.....	78
4.3.3	Analysis of Institutional theory in IS research.....	79
4.4	Conclusion.....	84
5.	Chapter 5. Methodology	88
5.1	Introduction	88
5.2	Research questions	88
5.3	Research methodology	89
5.4	Selection of cases	92
5.4.1	Selection of country	92
5.4.2	Selection of sector	92
5.4.3	Selection of units of analysis	93

5.5	Data collection.....	94
5.6	Data analysis	99
5.7	Ethical considerations: Confidentiality and sensitivity	102
5.8	Critical reflections on my role as a researcher	103
5.9	Quality of the study	104
5.9.1	Credibility	105
5.10	Conclusions	107
6.	Chapter 6. A comparison of expected versus realized benefits in HRIS projects in different contexts.....	109
6.1	Introduction	109
6.2	National case study in Country 1	110
6.2.1	National case study setting: NHO and its HRIS strategy	110
6.2.2	The HRIS project	111
6.2.3	Expected and realized benefits from HRIS and recipients of HRIS benefits	114
6.2.4	Factors affecting realization of expected HRIS benefits	128
6.3	Regional case study in Country 2.....	139
6.3.1	Regional case study setting: NHO and its HRIS strategy.....	139
6.3.2	The HRIS project	141
6.3.3	Expected and realized benefits from HRIS and recipients of HRIS benefits	142
6.3.4	Factors affecting realization of expected HRIS benefits	153
6.4	Discussion	161
6.5	Conclusion.....	165
7.	Chapter 7. A comparative case study on the development and implementation processes of HRIS.....	166

7.1	Introduction	166
7.2	National case study in Country 1	167
7.2.1	Innovation Stage 1: Comprehension/Intention to adopt	167
7.2.2	Innovation Stage 2: Adoption	177
7.2.3	Innovation Stage 2: Implementation	186
7.2.4	Post (project) scriptum	198
7.3	Regional case study in Country 2.....	198
7.3.1	Innovation Stage 1: Comprehension/Intention to adopt	198
7.3.2	Innovation Stage 2: Adoption	207
7.3.3	Innovation Stage 3: Implementation	216
7.3.4	Post (project) scriptum	224
7.4	Discussion	225
7.5	Conclusion.....	230
8.	Chapter 8. Conclusion.....	231
8.1	Introduction	231
8.2	Synthesis of research objectives and research findings	231
8.3	Research limitations	236
8.4	Theoretical and practical contributions and implications for future research	238
8.4.1	Contribution to theory	239
8.4.2	Contribution to policy and practice.....	241
8.5	Conclusion.....	242
	References.....	244
	Appendices.....	264
	Appendix 1. Systematic literature review search strategy	264

Appendix 2. Study information sheet	268
Appendix 3. Interview guide.....	270
Appendix 4. Application for ethical approval.....	271
Appendix 5. Scientific outputs arising from the PhD (journal and conference papers).....	273

List of Figures

Figure 1. Thesis structure.....	5
Figure 2. The HR/Payroll process framework	10
Figure 3. HRM practices supported by HRIS	17
Figure 4. Analysis of existing literature reviews on HRIS	24
Figure 5. PRISMA flow diagram.....	32
Figure 6. Types of publications on HRIS by year	48
Figure 7. HRM practices examined in the included studies	53
Figure 8. Project timeline.....	114
Figure 9. Visual representation of the conceptual framework (national case)....	197
Figure 10. Visual representation of the conceptual framework (regional case) .	223

List of Tables

Table 1. Characteristics of the included studies.....	33
Table 2. Theoretical frameworks referred to in qualifying studies.....	51
Table 3. Innovation stages examined in the included studies	55
Table 4. Summary of influential factors mentioned in the included studies.....	58
Table 5. HRIS benefits and recipients of HRIS benefits	69

Table 6. Exemplary studies focusing on influence of institutional pressures on ICT innovations	81
Table 7. List of documentation collected and analyzed.....	95
Table 8. Interview respondents	97
Table 9. Factors of influence that shaped HRIS project (national case).....	128
Table 10. Main content of the HR Development Program	140
Table 11. Factors of influence that shaped HRIS Project (regional case)	153
Table 12. Comprehension (national case). Data structure & exemplary quotes.	168
Table 13. Adoption (national case). Data structure & exemplary quotes	177
Table 14. Implementation (national case). Data structure & exemplary quotes.	186
Table 15. Comprehension (regional case). Data structure & exemplary quotes.	199
Table 16. Adoption (regional case). Data structure & exemplary quotes.....	207
Table 17. Implementation (regional case). Data structure & exemplary quotes.	216

Abbreviations

CASP	Critical Appraisal Skills Programme
e-HRM	Electronic Human Resource Management
EFQM	European Foundation for Quality Management
ERP	Enterprise Resource Planning
EU	European Union
HR	Human Resources
HRM	Human Resource Management
HRIS	Human Resource Information System
ICT	Information and Communications Technology
IS	Information System
NHO	National Health Organization
RHO	Regional Health Organization
Scimagojr	Scimago Journal ranking portal
Web of Science CC	Web of Science Core Collection
WHO	World Health Organization

1. Chapter 1

INTRODUCTION

Only a few decades ago the management of HR was regarded as a purely administrative activity, of relatively little value to organizations (Ulrich, 1997). Today's knowledge-based organizations, however, recognize that their success depends "disproportionally on the performance of their HR" (Lippert & Swiercz, 2005, p. 341). This increased recognition of the importance of HR function has led to a significant shift in the role of HR professionals (SHRM, 2008). Over the years, their role has changed in focus from performing administrative tasks such as Payroll, to a more strategic focus on HR management (HRM) practices such as employee talent management or organizational development strategies. The application of ICT within organizations in the form of IS has been critical in supporting this transformation in the role of HR in organizations as they have allowed the automation of administrative tasks, freeing up time for more complex HR activities. Thus, a recent global survey of HRIS use found that nowadays most organizations worldwide use HRIS not only administratively (e.g. Payroll or Benefits), but also for more strategic functions. For example, about half of organizations reported using HRIS for their service delivery (e.g. HR Portal), workforce management (e.g. scheduling) and talent management (e.g. performance management) related activities (Harris & Spencer, 2015).

Consultancy firms were the first to investigate whether investment in HRIS implementation projects was justified by the realization of expected benefits (Ruel

& Bondarouk, 2008). However, although increasingly sophisticated HRIS are being procured and implemented in numerous organizations worldwide, often at high expense in terms of technology, support and change management, academic scholars became involved in studying HRIS only recently, and so there is a lack of theoretically sound and rigorous empirical studies (Parry & Tyson, 2011). Consequently, there are few systematic evaluations that compare envisaged versus realized benefits of HRIS, especially for different stakeholders, as well as little definite knowledge about the nature of the factors that influence the translation of expected benefits during development and implementation into realized outcomes of HRIS during use (Parry & Tyson, 2011). However, understanding whether and how the perceptions of HRIS benefits varies according to the type of stakeholder is important, for example, for an understanding of what kinds of expected benefits motivate different stakeholders to accept HRIS initiatives, and what kind of benefits and for whom these initiatives actually achieve.

Moreover, there is a lack of knowledge of HRIS in the field of health in general (Engbersen, 2010), as health research has prioritized the evaluation of IS for clinical over administrative functions (Kivinen & Lammintakanen, 2013). Nevertheless, these are essential enabling eHealth technologies for the business of healthcare, and underpin much of the drive towards greater health care quality and efficiency across the world (Thouin & Bardhan, 2009). HRIS in a healthcare context is particularly interesting to study due to the complexity of its governance, including issues regarding technological, and workforce structures (Bondarouk, Ruel, & van der Heijden, 2009; Evers, 2009); and its comparability with IS implementation in other complex public sector organizations (e.g. top down

implementation approaches, reactive attitudes towards innovation (Troshani, Jerram, & Hill, 2011) including “diffusion difficulties” (McGrath & Zell, 2001)). Finally, healthcare systems, particularly those in the public sector, are highly complex organizational settings characterized by multiple institutional demands (pressures), which vie for dominance and shape the adoption, implementation and use of IS innovations (Currie & Guah, 2007; Sherer, Meyerhoefer, & Peng, 2016). Healthcare settings therefore also provide fertile ground for investigating the processes through which institutional demands influence IS innovation.

1.1 Aims and benefits of this research

Building on previous research on the expected and realized benefits from HRIS, I aimed initially to analyse the expected and realized benefits from HRIS projects for different stakeholders in different contexts, as well as to empirically examine whether and how identified in the systematic review socio-technical factors of influence (Tursunbayeva, Bunduchi, Franco, & Pagliari, 2016) shaped affected these projects.

The following specific research questions were developed in order to achieve the aforementioned research objectives:

- *RQ1: What are the expected benefits, actual outcomes and unintended consequences of introducing a new technological innovation – HRIS?*
- *RQ2: What are the expected benefits and outcomes for diverse HRIS project stakeholders and/or user groups?*

- *RQ3: What are the factors that influence the transformation of expected HRIS benefits into realized benefits?*

However, as the results of this analysis showed a difference between expected benefits as opposed to realised outcomes during the implementation and early assimilation of HRIS in the studied projects, I therefore developed the further aim of exploring the processes of HRIS development and implementation in both the contexts that led to this outcome. Here I used institutional theory that conceptualises organizational behaviour as the product of the ideas, values and beliefs embedded in the institutional environments in which organizations operate, and this helped me to explore the processes through which institutional pressures shape the development and implementation of an ICT innovation within an organizational setting, particularly by examining such influences over time.

The following additional research question was posed to achieve this objective:

- *RQ4: How do institutional pressures shape the development and implementation of an ICT innovation within an organization's setting over time?*

This PhD research aimed to contribute to both to the research and practice of HRIS by:

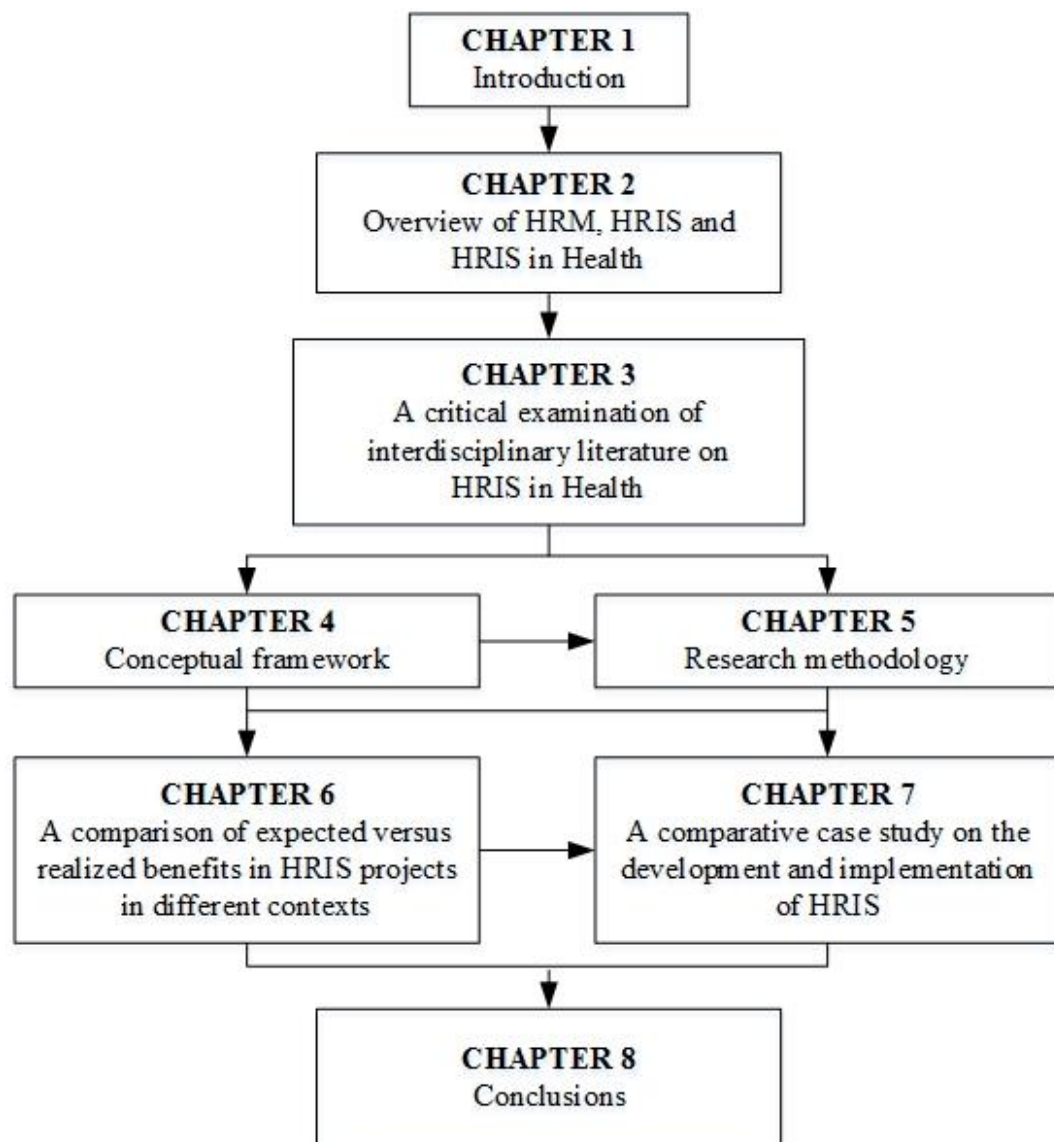
- Addressing an important gap in the interdisciplinary and international literature on the expected and realized benefits from HRIS for different stakeholders, as well as the processes of HRIS development and implementation that can cause these outcomes.

- Providing guidance to HRIS project's stakeholders on how to smooth the often challenging implementation processes, in order to ensure that these systems can yield the benefits they promise.

1.2 Structure of the thesis

This thesis consists of 8 chapters. The complete thesis structure is presented in Figure 1.

Figure 1. Thesis structure



Chapter 1 is an introduction and Chapter 2 offers a brief synopsis of the evolution of HRM and the role that HRIS has played in it. It also introduces the healthcare context which was chosen for this study. Chapter 3 provides an overview of the existing research on HRIS in health, what gaps there are in it, as well as discussing pertinent findings from the systematic literature review on HRIS in health that I conducted.

Chapter 4 introduces the conceptual (theoretical) framework for this study. It first describes generic frameworks for studying benefits from HRIS before moving on to the question of specific benefits from HRIS in health, and existing frameworks for studying factors shaping IS innovations. Moreover, it also describes three concepts derived from institutional theory used in this research (institutional pressures, organizing vision and strategic responses), and provides an overview of how institutional theory has been used in IS research so far. Thus, both Chapter 3 and 4 reveal gaps in the current literature and consequently justify the research questions identified.

Chapter 5 describes the research methodology used in this study. It starts from specifying how the research design and cases to study were chosen, as well as justifying the approaches to the data collection and analysis that have been adopted. It then describes data sources used in this study. Finally, it provides an overview of the ethical issues considered during this research, critical reflections on my role as a researcher, and on the quality of this study.

Chapter 6 presents findings flowing from a comparison of the expected versus the realized benefits in the national (Country 1) and regional (Country 2) case studies,

while Chapter 7 presents the results of the comparative analysis of the development and implementation of HRIS in the selected health organizations.

Chapter 8 discusses the significance of the findings of this research and the contribution it makes to the academic literature and to potential future practice.

Finally it identifies the limitations of the research undertaken, and on this basis suggests areas for further research in future.

2. Chapter 2

OVERVIEW OF HRM, HRIS AND HRIS IN HEALTH

2.1 Introduction

Organizations use three main types of resources - physical, organizational and human - in order to maximize their competitive advantage and achieve desired profitability (Thite, Kavanagh & Johnson, 2009). Many scholars have highlighted the importance that HR holds among these three. Thus, for example, Greer (1995, p.105) states that “In a growing number of organizations human resources are now viewed as a source of competitive advantage. There is greater recognition that distinctive competencies are obtained through highly developed employee skills, distinctive organizational cultures, management processes, and systems. This is in contrast to the traditional emphasis on transferable resources such as equipment... Increasingly, it is being recognized that competitive advantage can be obtained with a high-quality workforce that enables organizations to compete on the basis of market responsiveness, product and service quality, differentiated products, and technological innovation.”

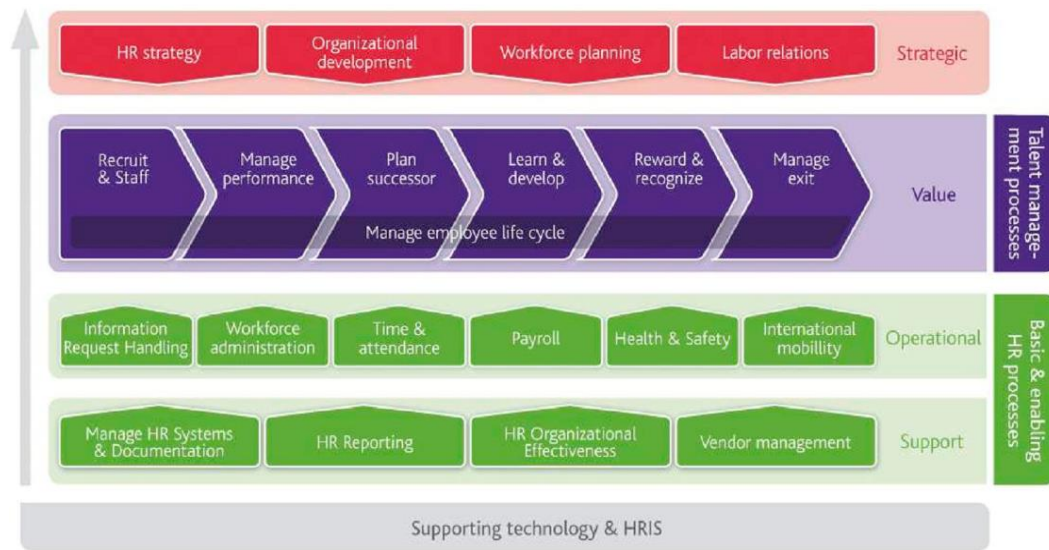
2.2 HRM: Concepts and definitions

Since HR are so important for organizations, management of HR has also been recognised as a critical priority. Scholars have provided various definitions of HRM. For example, Schuler and Jackson (1989) describe HRM practices as “a

system that attracts, develops, motivates, and retains employees to ensure the effective implementation and the survival of the organization and its members”, while Delery and Doty (1996) conceptualized it “as a set of internally consistent policies and practices designed and implemented to ensure that a firm’s human capital contribute to the achievement of its business objectives”. A more recent definition by Minbaeva (2005) refer to HRM practices “as a set of practices used by organization to manage human resources through facilitating the development of competencies that are firm specific, produce complex social relations and generate organizational knowledge to sustain competitive advantage”. In this thesis, I follow one of the most recent HRM definitions by Tan and Nasurdin (2011), whereby HRM amounts to “specific practices, formal policies, and philosophies that are designed to attract, develop, motivate, and retain employees who ensure the effective functioning and survival of the organization”.

HR managers pursue many organizational roles. Thus, for example, previous research has summarized contemporary HRM practices into sixteen operational, support and value processes that take their origin from four strategic objectives (see Figure 2 adopted from Foster, 2009).

Figure 2. The HR/Payroll process framework



Today efficient and effective HRM practices and policies also include the use of up-to-date and accurate employee data, which can be collected, maintained and reported by HRIS. Thus, HRIS plays a very important role in the management of organizational HR. However, as the role of HR managers has changed over time, so has the role HRIS plays in supporting it. The next section specifies the definition of HRIS used in this thesis, followed by a high-level overview of the evolution of HRM and the role that HRIS has had in it.

2.3 HRIS: Concepts and definitions

A wide variety of terminologies and definitions have been used in the literature to describe ICT aimed at supporting HRM (Strohmeier, 2007). A consequence of this is a lack of consistency and agreement in this area (Bondarouk & Ruel, 2009). Such systems have been explicitly referred to as:

- HRIS – “the composite of databases, computer applications, and hardware and software necessary to collect/record, store, manage, deliver, present,

and manipulate data for human resources” (Broderick & Boudreau, 1991, p.17) or the “system used to acquire, store, manipulate, analyse, retrieve, and distribute information regarding an organization’s human resources. An HRIS is not simply computer hardware and associated HR-related software. Although an HRIS includes hardware and software, it also includes people, forms, policies and procedures, and data” (Kavanagh, Gueutal & Tannenbaum, 1990, p. 29; Thite et al., 2009, p. 17).

- Electronic human resource or E-HR system - “created real-time, information-based, self-service, interactive work environment” (Lengnick-Hall & Moritz, 2003, p. 365);
- Electronic human resource management or e-HRM system - “a way of implementing HR strategies, policies, and practices in organizations through conscious and directed support of and/or with the full use of web-technology-based channels” (Ruel & Bondarouk, 2004, p.365-366); or
- Virtual HRM – technological mediated networks of different internal and external actors providing the firm with the HR services needed without the further existence of a conventional HR department (Strohmeier, 2007, p.20).

These terms can be used as to refer to standalone IS for HR, as for IS embedded within enterprise resource planning (ERP) systems (which is often the case in complex organizations) (Escobar-Pérez, Escobar-Rodríguez, & Monge-Lozano, 2010).

Due to the interdisciplinary nature of this research, in this thesis I refer to any ICT aimed at supporting the administration, management and development practices of HR as HRIS.

2.4 HRM and HRIS: origins and developments

HRM is a relatively new term, which only came into common use a few decades ago. A range of other terms have historically been used to describe HRM, reflecting both the role of HR managers and the economic and social environments in which they operated. For example, at the beginning of the 20th century HR professionals were often called welfare workers, while by the middle of the 20th century they were typically referred to as personnel managers.

The penetration of ICT into this HRM has made a significant contribution to the development of the field. The next section will review in detail the evolution of HRM and the role that HRIS played in it.

2.4.1 Beginning of 20th century (Pre-post World War I)

There were two major triggers for the birth of HRM departments within organizations. First was the appearance of industrial welfare work in the 1880s, when some organizations needed a new staff position to regulate and maintain records on employees' hours of work, health and safety issues and payroll (Thite et al., 2009). Thus in 1916 it became obligatory in many US factories to have a welfare worker (Kaufman, 2008). Second there was the establishment of separate employment offices that aimed to centralize and standardize such personnel administration functions as hiring or payroll (Kaufman, 2008). Thus Farnham

(1921) mentioned the existence of personnel administration staff in large-sized companies in both Germany and France already at the beginning of the 19th century (as cited in Kaufman, 2008).

In the meantime, supporting infrastructure began to emerge in addition to these practical developments in major organizations mostly in Europe, the US and Japan, in the form of the professional associations (e.g. the National Personnel Association), consulting firms (e.g. Industrial Relations Counsellors, Inc.), academic and industry journals (e.g. The Journal of Personnel Research), international conferences (e.g. the International Industrial Welfare (Personnel) Congress organized in the Netherlands in 1925) as well as academic research and teaching programs (e.g. the Industrial Relations Section launched in 1922 by Princeton University) (Kaufman, 2008).

Many contemporary scholars affirm the strategic importance of HRM functions (Ulrich, 1997). However, the first reference to the strategic mission of HRM was actually made back in 1920s. Thus, for example, in 1923 Harvard Business Review published an article about “Industrial Relations Management” (Hotchkiss, 1923) which stated that “When, however, we pass from tactics to the question of major strategy, industrial relations management is essentially functional rather than departmental. ... [It] deals with a subject matter which pervades all departments. ... [and] must to succeed exercise an integrating, not a segregating, force on the business as a whole.” (as cited in Kaufman, 2008, p. 5).

At this time in the history, these early HRM functions were keeping employee information in the form of paper records, as computer technologies were still not available (Thite et al., 2009).

2.4.2 Middle of 20th century (Pre-post World War II)

During the Second World War managers began to realize that employee motivation and productivity has a direct impact on organizational financial performance, and that employees are motivated not only by financial benefits, but also by diverse socio-psychological factors (Thite et al., 2009). Moreover, in that period the US government also introduced several employment laws that caused the creation of labour unions (Thite et al., 2009). Thus, HRM functions were established in most of the medium-large-size organizations, and the focus of HRM function shifted from only industrial welfare, staff recruitment and selection to also motivation and discipline, health and safety issues, as well as consultations regarding pay and collective issues (Kaufman, 2008). These changes found reflection in the volume and types of employee information that HRM function had to collect, store and report to the government. This was also about the time that the first computer technologies emerged, and were adopted by lead HRM functions from the US defence industry (e.g. US Air Force) to support employee data recording and retrieval, and the first HRM practice - payroll - was automated (Thite et al., 2009).

2.4.3 End of 20th century

In this period the U.S. government passed a great deal of employment related legislation such as employment taxes or stipulations regarding employee retirement benefits (Thite et al., 2009). This growing volume of legislative requirements affected the amount of administrative work associated with statutory reporting of HRM activities, and required HRM functions to provide up-to-date

and reliable data on their employees. Moreover, competition between companies increased during this period, and many international organizations aimed to cut costs while also improving operational efficiency and productivity. This generated a real need for automation of employee data gathering, analysis and retrieval, and forced HRM professionals to adopt ICT to automate their manual work in order to be able to focus on more complex practices (Thite et al., 2009). This is the point at which diverse HRIS vendors began to emerge (Thite et al., 2009).

In this period, the recognition also started to grow within organizations that “people are an asset and not a cost”, influenced by a growing acknowledgement that organizational success depends “disproportionally on the performance of their HR” (Lippert & Swiercz, 2005, p. 341).

2.4.4 Millennium and Contemporary Period

The last couple of decades witnessed both major technological developments such as the widespread adoption of the Internet, and the creation of web-based services, as well as a clear transformation of the HRM field. For example, the amount of literature related to strategic aspects of HRM has expanded significantly, and the number of student enrolments in HRM related programs has shot up (Kaufman, 2008).

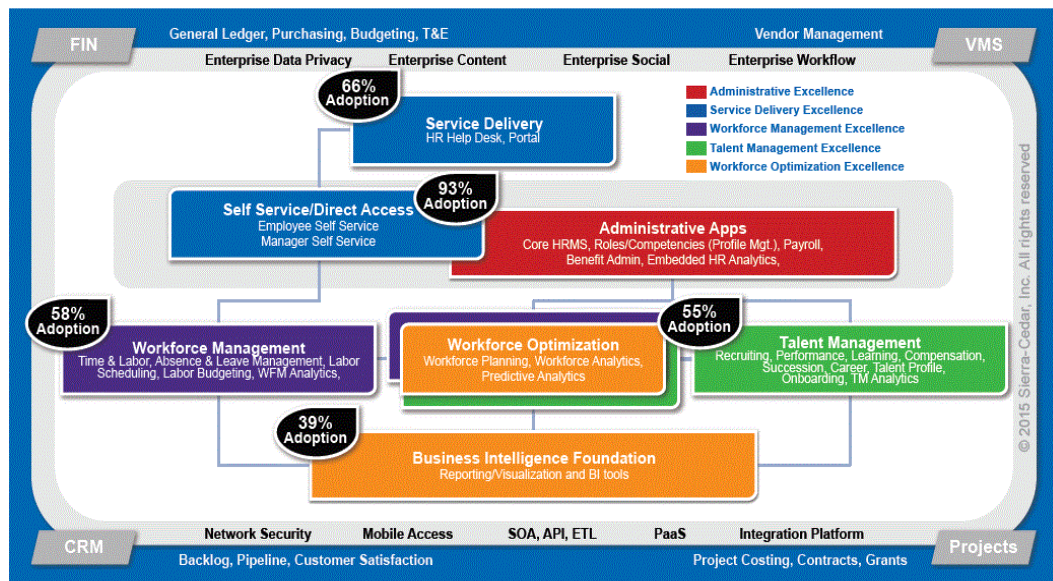
Thus, if only a few decades ago the management of HR was regarded as a purely administrative activity of little value to organizations (Ulrich, 1997), current recognition of the importance of HR function has led to a significant shift in the role of HR professionals (SHRM, 2008) from performing administrative tasks

such as Payroll, to a more strategic focus on HR management practices such as employee talent management or organizational development strategies.

HRIS were identified as a “key enabler” of Strategic HRM (Haines & Lafleuer, 2008), as they allowed the automation of administrative tasks and provided time for more complex HRM activities (Barrett & Oborn, 2013) such as talent management or staff training and development programs (Dery, Hall, Wailes, & Wiblen, 2013). Moreover, previous research has demonstrated that HRIS, and especially the human capital data they provide, can help with coordination and standardization of HR activities, as well as with improvement of workforce planning, and development of new business strategies (Bondarouk, Ruel, & Looise, 2011).

A recent global survey of HRIS use found (see Figure 3 adopted from Harris and Spencer, 2009) that nowadays most of organizations worldwide, motivated by expected benefits from HRIS, use them for their administrative functions (e.g. Payroll or Benefits administration), but that their use for more strategic functions is still lagging behind with only half of organizations reporting using HRIS for their service delivery (e.g. HR Portal), workforce management (e.g. scheduling) and talent management (e.g. performance management) related activities (Harris & Spencer, 2015).

Figure 3. HRM practices supported by HRIS



Wide adoption of HRIS among organizations was first remarked on by consultancy firms. Academic scholars became involved in studying HRIS only recently, although their interest has since been constantly increasing (Strohmeier, 2007). Thus, for example, several HR-related journals published special issues (e.g. Viswesvaran, 2003) dedicated to the use of technologies for HRM practices (Strohmeier, 2007). However, diverse scholars still underline that the available evidence is mostly anecdotal and there is a lack of theoretically sound and rigorous empirical studies on HRIS (Parry & Tyson, 2011). Moreover, this lack of knowledge on HRIS was found to be particularly apparent in the health sector (e.g. Engbersen, 2010; Riley et al., 2012), which traditionally prioritizes studies on clinical IS (Menachemi, Burkhardt, Shewchuk, Burke, & Brooks, 2006).

2.5 Health context: overview

Healthcare all over the world faces great challenges, including an ageing population, increased life expectancy, a potential decrease in the available skilled workforce in some areas, and the long-term effects of the 2008/2009 global economic crisis that have affected health budgets (Lang, 2011).

This under-financing has led to serious deficiencies in the quality of patient care delivery. Moreover, ineffective distribution of the available resources and their inefficient coordination has also resulted in overlapping responsibilities, repetition of efforts, and some resource wastage (McConnell, 2006).

Different countries adopted diverse approaches to respond to these challenges. However, many of them recognized the opportunity that ICT presents for improving the quality and accessibility of healthcare services, while also controlling their costs (e.g. Health ICT Industry Group, 2009). Thus, for example, Hamadoun Touré (2012), the secretary-general of the International Telecommunications Union (a United Nations specialized agency which aims to improve the standards of ICT in underserved areas, including e-health), stated that “In a world with a growing and ageing population, information and communication technologies will play a vital role in the provision and delivery of health care. In terms of patient care, e-health technologies enable remote patient monitoring; better dissemination of information to patients; improved access to health advice; access to remote consultations and telemedicine and quicker access to emergency services. E-health technologies also help to deliver better training for health-care workers, and they improve disease surveillance, data collection

and the management of patient records, thereby increasing transparency and accountability”.

Health organizations are characterized by a dual structure involving on the one hand, clinical functions and on the other business and support functions, and this is reflected in their ICT (Khatri, 2006). Despite the importance of business and support systems in health organizations very little research on their adoption or impacts exists, compared with other areas in health informatics and eHealth (Menachemi et al., 2006).

Previous research has underlined that HRIS in health contexts is an important area of study due the complexity of its governance, technological, and workforce structures (Bondarouk et al., 2009; Evers, 2009); and its comparability with IS implementation in other complex public sector organizations, including issues such as top down implementation approaches and reactive attitudes towards innovation (Troshani et al., 2011) including “diffusion difficulties” (McGrath & Zell, 2001), which will be discussed in detail in the following section.

2.6 HRIS in Health context: overview

As mentioned above, since they are not perceived as life critical, HRIS have received very little attention in the health literature and their development, implementation, use and impacts in health organizations are poorly understood, compared with clinical systems (e.g. Electronic Health Records).

However, “people costs” can account for 65-80% of health organizations’ total operating budgets (Khatri, 2006). Thus, effective management of HR is essential, from both a clinical and a budgetary perspective. HRIS can support a variety of

HRM practices, including recruitment and performance management, and provide health leaders with crucial information that can guide effective capacity planning and resource allocation. Unsurprisingly, successful implementation of HRIS in HR departments has been linked to improvements in patient care (Kabene, King, & Gibson, 2010).

The importance of HRIS, and the data that they can generate, has also been highlighted by various global health initiatives (e.g. WHO, 2015). For example, the WHO, in their 2006 World Health report stated that “systems for recording and updating health worker numbers often do not exist, which presents a major obstacle to developing evidence-based policies on human resource development” (WHO, 2006). Six years later, despite the importance of HRIS for underpinning strong health systems, a 2012 review (Riley et al., 2012, as described in Waters et al., 2013, p.896) concluded that “universal understanding of the HRIS used in monitoring human resources for health is minimal and baseline information regarding their scope and capability is practically non-existent ... the authors called for more descriptive research of HRIS globally, including documentation of impact so as to advance the science and evidence-based practice in this area”. Some researchers have already responded to this request and made their contributions to the international peer-reviewed literature (e.g. Kumar et al., 2013). However, since this topic lies at the intersection of informatics, management, and health, most of the existing HRIS studies in healthcare are spread across several discipline-specific bodies of knowledge, making it difficult to obtain a complete picture of the evidence base (Strohmeier, 2007).

Thus, although forms of HRIS have been used in healthcare for almost half a century (Audit Commission, 1995), this is still an evolving area for innovation. Increasingly sophisticated, modular HRIS are being procured and implemented in health organizations worldwide (Harris & Spencer, 2015), often at high expense in terms of technology, support and change management. While the benefits of these systems have been much vaunted by HRIS vendors (Horowitz, 1996) and policy makers (The Scottish Government, 2015), recent years have also seen some spectacular failures, where large scale implementation programs have encountered huge overspends, weak organizational buy-in or poor interoperability with existing systems (Thite & Sandhu, 2014). Given the opportunity cost of getting these projects wrong, developers, procurers, and managers require more guidance on the usefulness, effectiveness and implementation barriers associated with HRIS, as well as how to evaluate them.

2.7 Conclusions

As demonstrated in this chapter, the field of HRM has significantly evolved in the last century, and HRIS has played a noteworthy role in this transformation (Thite et al., 2009). Adoption of these systems by more organizations, driven by their expected benefits, has attracted the attention of practitioners and more recently academic scholars (Parry & Tyson, 2011). However, the available knowledge on their development, implementation, use or impacts is still scarce or spread across disciplinary boundaries (Strohmeier, 2007). This is especially true for the health sector, which has traditionally prioritized studies on clinical over administrative IS (Menachemi et al., 2006). However, given the opportunity cost of getting HRIS

initiatives wrong, developers, procurers, and managers require more guidance on the usefulness, effectiveness and implementation barriers associated with HRIS, as well as how to evaluate them. The present research aims to close this important literature gap.

3. Chapter 3

A CRITICAL EXAMINATION OF INTERDISCIPLINARY LITERATURE ON HRIS IN HEALTH

3.1 Introduction

This chapter presents the results of a systematic literature review¹ of HRIS in health. Its primary aim was to search interdisciplinary academic and grey literature to identify and classify the existing evidence on HRIS adoption, implementation and impact in health organizations worldwide, as well as to inform the research strategies for my empirical case studies (see Chapters 6 and 7). Thus, in addition to documenting and classifying the research on HRIS in health, this review also sought to understand the outcomes and implications of HRIS implementation in health organizations, the theoretical frameworks used to study them, and areas for future research.

¹ The systematic literature review presented in this chapter was conducted in collaboration with Dr. Claudia Pagliari (eHealth Research Group, University of Edinburgh) and Dr. Raluca Bunduchi (Business School, University of Edinburgh) as a part of my research visit to the University of Edinburgh and its findings have been disseminated in the following ways:

- Tursunbayeva, A., Pagliari, C., Bunduchi, R., Franco, M. (2015) Human resource information systems in healthcare: a systematic review. PROSPERO: CRD42015023581.
- Tursunbayeva, A., Pagliari, C., Bunduchi, R., Franco, M. (2015). Human resource information systems in healthcare: a systematic review (protocol). JMIR Res Protoc; 4(4):e135.
- Tursunbayeva, A., Bunduchi, R., Franco, M., Pagliari, C. (2016). Human resource information systems in health care: a systematic evidence review. Journal of American Medical Informatics Association.

The need for this systematic literature review emerged from background scoping work (Tursunbayeva, Pagliari, Bunduchi, & Franco, 2015) in which I searched for and examined existing reviews of HRIS literature. This work revealed that existent literature reviews on HRIS tend to be discipline-specific, typically coming either from a business, social science, or ICT perspective (see Figure 4). Only a few used a systematic approach (Riley et al., 2012; Sarkis & Mwanri, 2013; Strohmeier, 2007; Van Geffen, Ruel, & Bondarouk, 2013), and none encompassed the ICT, social science, business, and health literatures together. Only two reviews looked specifically at HRIS in healthcare (Riley et al., 2012; Sarkis & Mwanri, 2013), both of which prioritized medical and social science databases, and were limited in scope. The first, published in 2012, was aimed at uncovering baseline information on the use and capability of HRIS in different countries, as a means of understanding the challenges this presents for global health workforce monitoring and development. The second, published in 2013, examined the role of different types of innovative ICT as a means of enabling continuing professional development to strengthen HR capacity in healthcare.

Figure 4. Analysis of existing literature reviews on HRIS²

² Overall, six literature reviews mentioned in Figure 4 (Strohmeier, 2007; Van Geffen et al., 2013; Marler & Fisher, 2013; Bondarouk & Ruel, 2009; Bondarouk & Furtmueller, 2012; Ruel & Bondarouk, 2014) were adopted from “Orchestrating the e-HRM symphony” (Bondarouk, 2014), inaugural lecture given by Prof. T. Bondarouk at the University of Twente in December 2014; others I was familiar with based on background readings. Non-systematic literature reviews (Strohmeier 2012; Marler & Fisher, 2013; Ngai & Wat, 2006; Bondarouk & Ruel, 2009; Sareen & Subramanian, 2012; Bondarouk & Furtmueller, 2012; Ruel & Bondarouk, 2014) were classified according to their references and the journals these references were published in.

Literature Review Type	Information and Communication Technology	Social Science/ Business	Medicine
Systematic	Strohmeier, 2007; Van Geffen et al, 2013	Riley et al, 2012; Sarkis & Mwanri, 2014	
Non-Systematic	Ngai & Wat, 2006; Bondarouk & Ruel, 2009; Sareen & Subramanian, 2012; Bondarouk & Furtmueller, 2012; Ruel & Bondarouk, 2014	Strohmeier, 2012; Marler & Fisher, 2013	

3.2 Review objectives

As aforementioned scoping work identified only two previous literature reviews specifically examining HRIS in health, both of which are limited in scope (Tursunbayeva et al., 2015), I therefore set out to conduct an interdisciplinary systematic review utilizing sources of evidence from the ICT, social science, and health research literatures, and encompassing any ICT used for HR administration, management and development practices in health organizations.

Although the main aim of this review was to inform the research strategies for empirical case studies of my PhD research, the following specific objectives were also set for guiding it:

- Determine the prevalence and scope of existing research and evaluation pertaining to HRIS in health organizations;

- Analyse, classify, and synthesize existing evidence on the processes and impacts of HRIS development, implementation and use; and
- Generate recommendations for HRIS research, practice, and policy, with reference to the needs of different stakeholders and communities of practice.

3.3 Systematic literature review methodology

3.3.1 Search strategy

A comprehensive search strategy was iteratively developed and tested during a scoping phase (see Appendix 1). This was used to interrogate ten international online databases indexing medical/health (Cochrane Library, MEDLINE, and EMBASE), social science (ABI/Inform, ASSIA, and Sociological abstracts), ICT (IEEE Xplore), and multi-disciplinary research (Scopus, Web of Science Core Collection (Web of Science CC), and ScienceDirect). Grey literature sources were also examined, including reports from the WHO, relevant professional organizations (e.g. Chartered Institute of Personnel and Development, Society for Human Resource Management, Healthcare Information and Management Systems Society) and consulting firms (Deloitte, Ernst & Young, PricewaterhouseCoopers, KPMG). Academic dissertations were searched via Google, and the reference lists of qualifying articles were “snowballed” to identify additional studies. No restrictions were applied on publication year or language.

3.3.1.1 Keywords identification and search strategy creation

A comprehensive list of keywords for this systematic review (Tursunbayeva et al., 2015) was created via the following three main steps:

1. The following types of HR-related terms were identified:
 - a. HR terminology that the research team were familiar with based on the background readings;
 - b. Terms that were returned when I searched under “Human resource” in the US National Library of Medicine’s Medical Subject Headings browser, such as staff and manpower; and
 - c. Terms articulated within a highly-cited expert review analyzing theoretical, methodological, and topical aspects of e-HRM, and in the abstracts of the referenced articles (Strohmeier, 2007) (added during the “Search Query 2” development stage).
2. The ICT-related terms “information systems” and “information technology” were selected based on the background readings.
3. The research team identified general health terminology that we all were already familiar with: health, healthcare, hospital, clinic*, and medic*. Keywords “Health care” and “care” were not included, as they were not sufficiently sensitive.

I tested three main search queries for the identified keywords on June 25-26, 2015 (Results of this testing are provided in Tursunbayeva et al., 2016).

3.3.2 Article screening and selection

Generated outputs were stored in EPPI-Reviewer 4 systematic review software. After initial screening of titles and abstracts the full text of potentially relevant articles was examined by two reviewers (Dr. Raluca Bunduchi and myself) to assess their fit with the inclusion criteria. Disagreements were resolved through consensus or arbitration by a third reviewer (Dr. Claudia Pagliari).

3.3.2.1 Inclusion Criteria

There were two inclusion criteria:

1. Studies involving a formal or semiformal approach to the investigation or evaluation of HRIS, whether led by academia, industry (e.g. consulting sector), or from within the healthcare sector;
2. Studies of broader business/administrative/ERP/Hospital IS that explicitly examine their application to HR practices.

3.3.2.2 Exclusion Criteria

Descriptive reports, pure market research, articles focused on software design issues, studies not primarily focused on HRIS or which mentioned HRIS without specifying the health sector, and articles examining generic ERPs/Hospital ISs without referring to HR functionalities were excluded. Details of the filters applied at each screening stage are included in the PRISMA flow diagram (see Figure 5).

3.3.3 Data extraction and analysis

I extracted information from all eligible studies using a structured form containing the following fields: Authors; Publication year; Setting (type of organization, country/region in which the study was conducted); Innovation stage; Journal discipline; HRIS functionality; Research purpose/questions; Theoretical basis; HRIS users; Study design; and main findings.

Extracted information was then verified by all team members (Dr. Claudia Pagliari, Dr. Raluca Bunduchi and Prof. Massimo Franco).

To differentiate between HRIS project stages, I borrowed from existing innovation models (e.g. Bunduchi & Smart, 2010; Pagliari, 2007), and coded the results according to the following three main innovation stages:

1. Development including needs assessment, procurement initiation, prototyping and user acceptance testing;
2. Implementation including purchasing, systems integration, organizational change management and training; and
3. Use including adaptation of organizational procedures to accommodate routinization of the innovation as part of day-to-day working practices.

Drivers and benefits of HRIS in this systematic review were coded according to Parry and Tyson's (2011) framework for comparing the intended and actual benefits of HRIS adoption. This includes six types of goal relating to: *Operational Efficiency*, *Service Delivery*, *Strategic Orientation*, *Manager Empowerment*, *Standardization* and *Organizational Image*. Additional goals emerging from the analysis were added into separate categories.

Of the various models of HRM practices described in the literature (e.g. Patterson et al., 2010), including in relation to HRIS (e.g. Harris & Spencer, 2015), I chose to adapt Foster's "E-HRM Landscape" model (Foster, 2009) to classify qualifying studies (see Figure 7) as it covers the majority of the HRM practices mentioned. To the verbs describing core objectives of HRIS in the e-HRM Landscape I added "interact", taking account of HRIS modules described as self-service, HR portals or HR Intranets. I also added several sub-categories reflecting additional functions mentioned in the studies (e.g. employee relations or qualifications tracking). Finally, a Kwon and Zmud (1987) framework was used to classify the factors that influence the development, implementation and use of HRIS in health organizations. This model enriches the widely-used Technology – Organization – Environment (otherwise known as the TOE) framework (DePietro, Wiarda, & Fleischer, 1990), with such additional categories as Individual and Task related factors.

3.3.4 Critical appraisal techniques

Following recommendations for systematic reviews of qualitative research (Sheikh, Nurmatov, Cresswell, & Bates, 2013; Dyba & Dingsoyr, 2008) qualitative Critical Appraisal Skills Programme (CASP) checklist (CASP, 2016) was adapted to assess the quality of the included studies. Questions concerning the appropriateness of qualitative methodology and ethical issues were eliminated, since a first reading of the material revealed that most eligible studies were qualitative and lacked ethical considerations (see Tursunbayeva et al., 2016 for

details). In addition to the “yes” or “no” answers, a “not clear” option (corresponding to scores of 1.0, 0.5 and 0 respectively) was added.

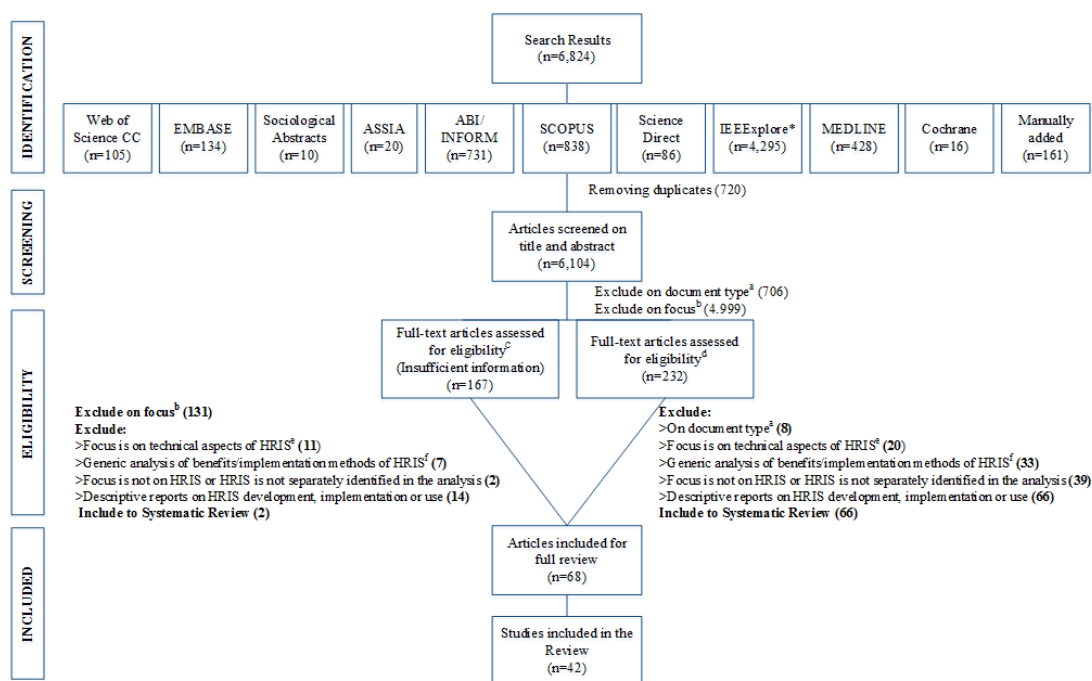
I appraised all eligible studies. A second reviewer (Dr. Claudia Pagliari) independently appraised a random 20% sample to assess inter-rater consistency and facilitate discussion about the process and any ambiguities. Since only a few minor discrepancies were identified, further secondary appraisal focused on studies about which I (as the first reviewer) was uncertain.

3.4 HRIS in Health: literature synthesis

3.4.1 Review results

6,824 results were generated by the search strategy and 6104 titles and abstracts remained after removing 720 duplicates. Of these 399 qualified for full text review: 232 due to their potential eligibility and 167 because there was insufficient information in the title or abstract to make a decision. After removing documents not meeting the inclusion criteria, 68 publications representing 42 separate studies (see Table 1) were included in the final analysis. The stages of selection are illustrated in the PRISMA diagram labelled Figure 5.

Figure 5. PRISMA flow diagram³



³ ^a Book reviews; Front and Back covers; Copyright notice; Title pages; Collection of conference proceedings' descriptions; Tables of Content; Press releases; Announcements; Descriptions of issues; Advertisements; Bulletins; Questionnaires'; Notices of Retraction; Chair's messages; Keynotes; Plenary Talks; Welcome Messages; News published in journals and magazines that have "news" word in their titles and news published by the companies which do not provide any analytical or research materials; Presentation description; Very brief cases and analytical materials published in newspaper and magazines; Company profiles; Advertising/marketing articles. ^b Articles not related to HRIS in health organizations; Research on HR practices in health organization that do not defer to the use of ICT in relation to HR activities. ^c Articles where no abstract was available, or where the title and abstract did not give sufficient detail to judge eligibility; Articles on HRIS which do not specify the industry/sector in which they have been implemented; Articles on generic ERP/HIS that do not specify the module/functionality and/or the industry/sector in which they have been implemented. ^d Potentially relevant articles referring to HRIS in health organizations. ^e Articles focused on computer science models (e.g. software specification) or management science models (e.g. creating algorithms for enabling staffing and scheduling in health organizations). ^f Generic analyses of principles, benefits, requirements, implementation methods of HRIS in health organizations, or pure market research.

Table 1. Characteristics of the included studies

#	Authors, year (discipline)	Country (Income ^a); HO (IS)	Research goals	Study design (Quality score 0-10)	Key findings (According to Innovation Stages)
S1	Altuwajri and Khorshed, 2012 (SS)	Saudi Arabia (High); Mixed ^b (Gen.: ERP)	To propose a new generic model for successful implementation of ICT projects.	Qlt. (4)	<p>Implementation</p> <ul style="list-style-type: none"> Barriers: Individual and Project <p>Use</p> <ul style="list-style-type: none"> Realized^c: Operational, Strategic, Empowerment, and ICT Infrastructure
S2	Bakar, Sheikh and Sultan, 2012 (ICT/Health)	Tanzania (Low); The Ministry of Health (Ded.: Open Source HRIS)	To describe the opportunities and related challenges of integrating Open Source Software process in organization.	Qlt. (5.5)	<p>Use</p> <ul style="list-style-type: none"> Barriers: Environment, Project and Individual Realized^c: Operational and Service Approaches to: Technology
S3	Bondarouk and Ruel, 2003 (N/A)	Netherlands (High); Secondary (Hospital) (Ded.: Personnel and salary administration system)	To explore differences in the adoption of a human management system between two groups of users.	Qlt. (6)	<p>Implementation</p> <ul style="list-style-type: none"> Facilitators: Individual, Technology and Organization Barriers: Organization and Individual
	Bondarouk and Sikkell, 2003 (N/A)		To apply a theory of a group learning to highlight relevant aspects of implementation of groupware.		<p>Use</p> <ul style="list-style-type: none"> Facilitators: Individual,

	Bondarouk and Sikkel, 2004 (N/A)		To look closer at groupware implementation from a learning-oriented approach		Technology and Organization <ul style="list-style-type: none"> Barriers: Organization and Individual
	Bondarouk, 2004 (SS/ICT)		To describe the project concerning the implementation of a personnel management system.		
	Bondarouk and Sikkel, 2005 (SS)		1.To validate five processes of adoption of ICT through group learning; 2.To get insights on which of the group processes are most influential in the system implementation.		
	Bondarouk and Ruel, 2008a (N/A)		To explore the relationship between the organizational climate for innovation and ICT implementation success.		
	Bondarouk and Ruel, 2008b (SS)		To describe an HRM system that can lead to ICT implementation success.		
S4	IntraHealth Int., Inc. ^d , 2009 (N/A)	9 African countries (Low or Lower-Middle); NHS (Ded.: Open Source HRIS)	To present an overview of the results achieved by the Capacity project.	Report (Qlt.) (5.5)	Use <ul style="list-style-type: none"> Facilitators: Project Realized^e: Strategic Outcomes > Generic: Interest from other countries
S5	Cockerill and O'Brien-Pallas, 1990 (Health)	Canada (High); Secondary (>1 Hospitals) (Gen.: Nursing Workload Measurement Systems)	To develop a profile of use of nursing workload measurement systems in Canadian hospitals; assess user satisfaction, identify the challenges, and the research issues related to these systems.	Qnt. (6)	Implementation <ul style="list-style-type: none"> Barriers: Organization Generic: Project and Individual
	O'Brien-Pallas and Cockerill, 1990 (Health)		To explore senior nurse executives' needs and expectations for nursing workload systems.		Use <ul style="list-style-type: none"> Realized^e: Strategic Satisfaction: Familiarity with the system, its functions or use of them and user satisfaction varied

					<p>between roles; System needs to reflect true workload for users to be satisfied.</p> <ul style="list-style-type: none"> Approaches to: Technology and Individual
S6	Dent, Green, Smith, & Cox, 1991 (N/A)	UK (High); Secondary (>1 Hospitals) (Ded.: Manpower IS)	To find out how the district managements had prepared for, and were responding to, the implementation of three corporate computer systems.	Qlt. (5.5)	<p>Implementation</p> <ul style="list-style-type: none"> Facilitators: Organization and Project Barriers: Organization Approaches to: Project and Technology
	Dent, 1991 (SS)		To examine the development of computing and ICT strategies within the NHS England and Wales.		
S7	Engbersen, 2010 (N/A)	Netherlands (High); Secondary (Hospital) (Gen.: Intranet)	To advance understanding of the special features of e-HRM implementation and to provide insight in what kind of influences e-HRM has on the HRM department and the organization.	Qlt. (6.5)	<p>Implementation</p> <ul style="list-style-type: none"> Recommendations: Individual, Organization, Project and Task <p>Use</p> <ul style="list-style-type: none"> Barriers: Individual, Task and Organization Outcomes>Generic:No change to Operational and Strategic
S8	Escobar-Perez and Escobar-Rodriguez, 2010 (SS)	Spain (High); Secondary (Hospital) (Gen.:ERP)	To analyse the process of implementation of ERP systems in hospitals, as an organization with divided and heterogeneous functional areas. To identify the principal technological objectives that were set in the process of implementation, which of those objectives were achieved, and the deficiencies that have subsequently become	Qlt. (5.5)	<p>Development</p> <ul style="list-style-type: none"> Expected^c: Strategic Generic: Organization, Technology and Individual <p>Implementation</p> <ul style="list-style-type: none"> Generic: Individual Approaches to: Inter-

	Escobar-Perez, Escobar-Rodriguez and Monge-Lozano, 2010 (ICT)		evident.		<p>Organization, Project and Individual</p> <p>Use</p> <ul style="list-style-type: none"> • Barriers: Project and Individual • Satisfaction: Varies between roles • Approaches to: Technology
S9	Evers, 2009 (N/A)	Netherlands (High); Secondary (Hospital) (Ded.: HR Portal)	To assess the contribution of an HR portal towards HR processes.	Qlt. (6.5)	<p>Development</p> <ul style="list-style-type: none"> • Expected^c: Strategic, Service and Operational <p>Implementation</p> <ul style="list-style-type: none"> • Recommendations: Project, Task and Individual • Realized^c: Empowerment <p>Use</p> <ul style="list-style-type: none"> • Satisfaction: Users need time to judge the system; Strong relationship between system ease of use and user satisfaction. • Outcomes>Generic: No change to Operational and Service • Downsides: Reduced Operational and Empowerment • Recommendations: Project and Task
S10	Fahey and Burbridge, 2008 (Health)	USA (High); Secondary (>1 Hospitals) (Gen.:	To present a case study of a failed attempt to apply the principles of diffusion of innovation to a software program.	Qlt. (4.5)	<p>Development</p> <ul style="list-style-type: none"> • Generic: Technology <p>Implementation</p>

		Daily Staff Management System)			<ul style="list-style-type: none"> Facilitators: Organization Barriers: Technology and Organization
					Use <ul style="list-style-type: none"> Facilitators: Organization Barriers: Organization and Task
S11	Fehse, 2002 (N/A)	Netherlands (High); Secondary (Hospital) (Ded.: Personnel IS)	To explore to what extent and how does organizational politics explain IS implementation outcomes.	Qlt. (6.5)	Development Expected ^c : Strategic Implementation <ul style="list-style-type: none"> Facilitators: Individual Barriers: Organization, Project and Individual Generic: Individual and Organization Approaches to: Project and Technology Use <ul style="list-style-type: none"> Outcomes>Generic:No change to Operational
S12	Gurrol, Wolff and Berki, 2010 (N/A)	Turkey (Upper-Middle); Secondary (Hospital) (Ded.:e-HRMS)	To investigate several specific and critical points that will contribute to a better understanding of e-HRM and to provide a model for the implementation of e-HRM.	Qlt. (4.5)	Use <ul style="list-style-type: none"> Realized^c: Operational, Strategic and Empowerment
S13	Hawker et al., 1996 (Health)	Canada (High); Secondary (Hospital) (Gen.: Workload	To describe the development and application of a computerized workload measurement tool for use in hospital nursing education departments.	Qlt. (2.5)	Use <ul style="list-style-type: none"> Realized^c: Service and Strategic

		Measurement System)			
S14	Helfert, 2009 (SS)	Ireland (High); NHS (Ded.: Personnel Payroll Attendance and Recruitment System)	To outline a framework for analysing healthcare process management projects.	Qlt. (5.5)	Implementation <ul style="list-style-type: none"> Barriers: Individual, Project, Task, Inter-Organization, Organization and Technology Approaches to: Inter-Organization and Project
S15	Kazmi and Naaranoja, 2014 (SS)	Pakistan (Lower-Middle); Secondary (Hospital) (Ded.: HRIS)	To propose an evaluation that how in a small business scenario, the bits and pieces of knowledge can be seen scattered at different work locations and how the management can strategically manage a viable data resource in the form of existing knowledge base to be retrieved as and when required.	Qnt. (4)	Use <ul style="list-style-type: none"> Satisfaction: Majority of users are satisfied with the information system provides
S16	Kumar et al., 2013 (Health)	Pakistan (Lower-Middle); NHS (N.S.: HRIS)	1.To document as to how HR information is currently being collected, managed and reported; 2. To identify the gaps related to HRH data that need to be urgently addressed; 3.To suggest the tools and processes for managing HR data.	Qnt. (6.5)	Development <ul style="list-style-type: none"> Expected^c: Operational, Service and Strategic
S17	Lin et al., 2010 (ICT/Health)	Taiwan (High); Secondary (Hospital) (Gen.:Nursing Assistants Management System)	To compare the results of the manual operation and system intervention in assigning work to nursing assistants, in order to evaluate the system's performance.	Mixed method (4.5)	Use <ul style="list-style-type: none"> Realized^c: Operational and Patient Care Satisfaction: Different categories of users are satisfied with the system
S18	Memel et al., 2001 (Health)	USA (High); Secondary (>1	To discuss the specific components of the information management and ICT infrastructure,	Qlt. (2)	Development <ul style="list-style-type: none"> Expected^c: Operational

		Hospitals) (Gen.: Intranet)	examples of the impacts they have had on patients, caregivers, and the organization, and lessons learned.		Use <ul style="list-style-type: none"> • Realized^c: Operational and Service • Approaches to: Technology
S19	Parry and Tyson, 2011 (SS)	UK (High); Secondary (>1 Hospitals) (Ded.: e-HRM)	To examine the goals stated by organizations for the introduction of e-HRM, whether these goals were actually achieved, and the factors affecting this.	Qlt. (7)	Development <ul style="list-style-type: none"> • Expected^c: Standardization, Operational, Service, Strategic, and Empowerment Implementation <ul style="list-style-type: none"> • Facilitators: Individual and Project • Generic: Technology Use <ul style="list-style-type: none"> • Realized^c: Operational, Service, Strategic and Standardization
S20	Pierantoni and Vianna, 2003 (Health/SS)	Brazil (Upper-middle); Departments of Health (N.S.: HRIMS)	1.To evaluate the implementation of HRIS in selected Health Departments and present the implementation evaluation methodology; 2.To identify the limits and possibilities for using the system as HR planning and management tool in local health systems.	Mixed method (5.5)	Development <ul style="list-style-type: none"> • Expected^c: Strategic Implementation <ul style="list-style-type: none"> • Facilitators: Environment and Organization • Barriers: Environment, Organization, Technology and Individual Use <ul style="list-style-type: none"> • Facilitators: Environment and Organization • Approaches to: Task
S21	PWC, 2010	Queensland,	1.To review the organization of corporate	Report	Development

(N/A)	Australia (High); NHS (Ded.: Payroll system)	services under the shared services model to determine the most appropriate arrangements for the future, and make recommendations on the appropriate governance model for shared services going forward; 2.To provide recommendations for the future rollout of the Corporate Solutions Program and for the most effective way to deliver the Program.	(Qlt.) (5.5)	<ul style="list-style-type: none"> • Expected^c: Strategic, Technology, Standardization • Facilitators: Individual and Project • Recommendations: Project, Technology, Environment, Task, Organization, and Individual • Approaches to: Environment
KPMG,2010a (N/A)		To summarise the work undertaken to date on the review of the Queensland Health (QH) Payroll implementation project.		<p>Implementation</p> <ul style="list-style-type: none"> • Facilitators: Project and Individual • Barriers: Environment, Inter-Organization, Organization, Project, Technology, Individual, and Task • Approaches to: Technology, Inter-Organization and Project • Recommendations: Inter-Organization, Project, Task and Technology <p>Use</p> <ul style="list-style-type: none"> • Generic: Organization, Project and Technology
KPMG,2010b (N/A)		To review the current status, proposed solutions, strategies, programs of work and governance frameworks in place for the payroll system.		
KPMG, 2012 (N/A)		To conduct a review of payroll and rostering systems, to establish their ongoing suitability for QH, and to ascertain what potential options are available to resolve the recent payroll problems.		
E&Y, 2010 (N/A)		To evaluate the effectiveness of the Department of Public Work's program and project management processes, and QH processes, in relation to the business readiness of, and transition to new systems.		
Auditor-General of Queensland, 2010 (N/A)		To present a full and careful inquiry into the implementation of the Payroll System.		
Chesterman, 2013 (N/A)		To propose the approach to represent the dynamic relations between social and material	Qlt. (5.5)	
Silva and Rosemman,				

	2012 (N/A)		entities where the latter are divided into technical and organizational entities.		<ul style="list-style-type: none"> • Approaches to: Project • Outcomes>Generic: Resignation of the Minister of Health; Strikes; Improved country ICT strategy and governance procedures • Recommendations: Inter-Organization, Organization, Project, Task, Technology, and Individual
	Eden & Sedera, 2014 (N/A)		1. To illustrate the factors that contributed to QH's disastrous implementation project; 2. To understand the broader applications of this project failure on state and national legislations as well as industry sectors.		
	Thite and Sandhu, 2014 (SS/ICT)		1. To ascertain the main reasons for the failure of the new payroll implementation project; 2. To develop a theoretically and practically derived system development life cycle model.		
S22	Rauhala, 2008 (N/A)	Finland (High); Secondary mixed (Gen.: Patient classification system)	To evaluate whether the patient classification system was valid and feasible enough to be used as a measurement tool for HRM in nursing in the wards of somatic specialized health care.	Qnt. (7.5)	Use Approaches to: Task
	Fagerstrom et al., 2000a (Health)				
	Fagerstrom et al., 2000b (Health)				
	Rauhala and Fagerstrom, 2004 (Health)				
	Rauhala and Fagerstrom, 2007 (Health)				
	Rauhala et al., 2007 (Health)				
S23	Fagerstrom, 2009 (Health)	Finland (High); Secondary (>1)	To illustrate how the system can be used to facilitate evidence-based HRM.	Qnt. (6)	Use <ul style="list-style-type: none"> • Realized^c: Strategic

		Hospitals) (Gen.: Patient classification system)			<ul style="list-style-type: none"> Approaches to: Task
S24	Rainio and Ohinmaa, 2005 (Health)	Finland (High); Secondary (Hospital) (Gen.: Patient classification system)	To assess the feasibility of the system in nursing staff management, and whether it can be seen as the transferring of nursing resources between wards according to the information received from nursing care intensity classification.	Qnt. (5.5)	Use <ul style="list-style-type: none"> Approaches to: Technology
S25	Riley et al., 2007 (Health)	Kenya (Lower-Middle); NHS (Ded.: Nursing Workforce database)	To describe the development, initial findings, and implications of a national nursing workforce database system in Kenya.	Mixed method (5)	Use <ul style="list-style-type: none"> Facilitators: Environment and Organization Realized^c: Strategic Approaches to: Technology Recommendations: Technology
S26	Riley et al., 2012 (Health/SS)	Int.; NHS (N.S.: HRIS)	To: (1) review and assess national practices in HRIS implementation worldwide; (2) identify the main areas of weakness in HRIS implementation, with attention to countries facing acute health workforce shortages; and (3) draw upon documented best practices to offer recommendations to decision and policy makers on how to improve the science and application of HRIS.	Syst. Review (6.5)	Development <ul style="list-style-type: none"> Expected^c: Strategic Use <ul style="list-style-type: none"> Approaches to: Environment, Organization, Technology and Task
S27	Rodger et al., 1998a (N/A) Rodger et al.,	USA (High); Mixed (Ded.: HRIS)	To describe the efforts of the HR Department to redesign its HRIS to better meet enterprise-wide goals of cost effectiveness and efficiency.	Mixed method (4.5)	Use <ul style="list-style-type: none"> Satisfaction: Users are satisfied with the distribution of HRIS

	1998b (SS/ICT)				<p>reports and their confidentiality, but not with complicated procedures and forms for HRIS</p> <ul style="list-style-type: none"> • Approaches to: Technology and Task • Recommendations: Project, Task and Individual
S28	Ruland, 2001 (ICT/Health)	Norway (High); Secondary (Hospital) (Gen.: Decision Support System)	To describe the system development process.	Mixed method (5.5)	<p>Development</p> <ul style="list-style-type: none"> • Expected^c: Strategic, Empowerment and Operational • Facilitators: Project and Individual
	Ruland and Ravn, 2001 (ICT/Health)		To evaluate system's effect on nursing costs, quality of management information; user satisfaction; and ease of use; and its usefulness as decision support for improved financial management and decision-making.		<p>Implementation</p> <ul style="list-style-type: none"> • Facilitators: Project and Individual <p>Use</p> <ul style="list-style-type: none"> • Facilitators: Organization Individual, Project and Technology • Realized^c: Operational and Strategic • Satisfaction: Users are satisfied with the system and information it provides
S29	Sammon and Adam, 2010 (SS/ICT)	Ireland (High); NHS (Gen.: ERP)	To conduct an investigation into the managers' level of understanding of ERP project implementation and the preparations that should be made to increase the likelihood of its success.	Qlt. (6.5)	<p>Development</p> <ul style="list-style-type: none"> • Expected^c: Strategic <p>Implementation</p> <ul style="list-style-type: none"> • Barriers: Project

					<ul style="list-style-type: none"> Approaches to: Organization and Project
S30	Schenck-Yglesias, 2004 (N/A)	Malawi (Low); NHS (Gen.: HRIS)	To review the availability of staff deployment and training data from routine IS in Malawi and to inform the Ministry of Health and Population of deficiencies that would need to be addressed to better inform the development, ongoing monitoring and deployment of training policies.	Report (Qlt.) (5.5)	<p>Development</p> <ul style="list-style-type: none"> Approaches to: Inter-organization and Technology <p>Use</p> <ul style="list-style-type: none"> Recommendations: Task
S31	Shukla et al. ^d , 2014 (N/A)	India (Lower-Middle); NHS (Ded.: Open source HRIS)	To review HRIS across all 28 states and 7 union territories of India to assess their purpose, scope, coverage, software technology, usability, and sustainability.	Report (Qlt.) (5.5)	<p>Development</p> <ul style="list-style-type: none"> Expected^c: Operational and Compliance Facilitators: Project <p>Use</p> <ul style="list-style-type: none"> Approaches to: Inter-Organization, Project, Task and Individual
S32	Smith, Wiggins and Bird, 1979 (ICT)	USA (High); Secondary (Hospital) (Ded.: A computer based scheduling system)	To discuss three years' experience in computer-assisted scheduling of nursing personnel.	Qlt. (2.5)	<p>Development</p> <ul style="list-style-type: none"> Expected^c: Strategic <p>Implementation</p> <ul style="list-style-type: none"> Facilitators: Individual and Project Approaches to: Technology and Individual <p>Use</p> <ul style="list-style-type: none"> Realized^c: Operational and Empowerment Satisfaction: Can decline over time due to technical design,

					<p>operation and organization changes and changed capabilities of users</p> <ul style="list-style-type: none"> • Approaches to: Technology and Individual • Recommendations: Project, Environment and Organization
S33	Spaulding, 2012 (N/A)	US, Australia, Canada, UK (High); Secondary (>1 Hospitals) (N.S.: HRIS)	1.To review existing conceptualisations of HRIS and set forth propositions defining the impact such systems have on individual and organizational performance; 2. To test several of those propositions through evaluating hospital HRIS use and hospital acquired condition outcomes; 3. Cost effectiveness analysis which examines different team compositions of rapid response teams.	Qnt. (6.5)	<p>Use</p> <p>Realized^c: Patient Care</p>
S34	Spero, McQuide and Matte, 2011 (Health/SS)	Uganda (Low); Professional Organization (Ded.: Open source HRIS)	1.To describe Uganda's transition from a paper filling system to an electronic HRIS; 2. To describe how HRIS data can be used to address workforce planning questions via an initial analysis of the Uganda Nurses and Midwives Council training, licensure and registration records.	Mixed method (5)	<p>Use</p> <ul style="list-style-type: none"> • Realized^c: Operational and Patient Care • Approaches to: Technology • Recommendations: Technology
S35	Stamouli and Mantas, 2001 (ICT/Health)	Greece (High); Secondary (>1 Hospitals) (Gen.: IS for the Nursing Service)	To describe the development and the evaluation of an IS for the Nursing Service Administration.	Qnt. (4.5)	<p>Development</p> <ul style="list-style-type: none"> • Expected^c: Strategic and Operational • Barriers: Individual and Organization

					Use <ul style="list-style-type: none"> • Facilitators: Technology and Project • Satisfaction: Users are satisfied with the system user friendliness and information it provides
S36	Thouin and Bardhan, 2009 (N/A)	USA (High); Secondary (>1 Hospitals) (Ded.: HRM systems)	To study the effect of: 1. ICT usage on improvements in the quality of patient outcome; and 2. Clinical and administrative ICT usage on financial performance.	Qnt. (6)	Use Realized ^c : Patient Care and Operational
S37	Valentine et al., 2008 (Health)	USA (High); Secondary (>1 Hospitals) (Ded.: Automated open-shift management program)	To discuss how a successful nursing initiative to apply automation to open-shift scheduling and fulfilment across a 3-hospital system had a broad enterprise-wide impact.	Mixed method (2)	Implementation <ul style="list-style-type: none"> • Facilitators: Individual • Approaches to: Task
					Use <ul style="list-style-type: none"> • Realized^c: Operational, Empowerment and Strategic • Approaches to: Technology
S38	Waring, 2000 (N/A)	UK (High); Secondary (Hospital) (Ded.: Payroll-personnel system)	To critically investigate potential emancipatory principles for system analysis, design and development, synthesized from the wider literature, and then to translate these principles into practice within the context of IS implementations.	Qlt. (7)	Development <ul style="list-style-type: none"> • Expected^c: Service, Compliance and Factors Beyond the Control of Organization • Facilitators: Project • Barriers: Organization, Task and Inter-Organization • Approaches to: Inter-Organization and Project
	Waring, 2004 (SS)				Implementation <ul style="list-style-type: none"> • Barriers: Organization and Inter-

					Organization <ul style="list-style-type: none"> Approaches to: Project and Technology
S39	Warner, Keller and Martel, 1991 (Health)	USA (High); Secondary (>1 Hospitals) (Ded.: Nurse scheduling system)	To: 1.Describe what nursing administration is looking for in an automated scheduling system; 2.Discuss issues of implementation from the viewpoint of nursing administration, including realizable benefits.	Qlt. (2)	Use <ul style="list-style-type: none"> Realized^c: Strategic and Operational
S40	Waters et al., 2013 (Health)	Kenya (Lower-Middle); NHS (Ded.: Open-source HRIS)	To document impact of the system data on HR policy, planning and management.	Mixed method (5.5)	Use <ul style="list-style-type: none"> Realized^c: Operational, Strategic and Compliance
S41	West, Farmer and Whyte, 2004 (Health)	UK (High); Primary (Gen.: IS to collect workload data)	To describe the implementation of a computerised IS to collect workload data and to discuss feedback from staff evaluation of use and value.	Qlt. (5.5)	Use <ul style="list-style-type: none"> Barriers: Organization, Task and Individual
S42	WHO, 1990 (N/A)	Int.; NHS (N.S.: HRH IS)	To share expertise and experiences in the areas of research and health personnel IS, and to identify strategies for the better use of information and research in decision-making for HRH development.	Report (Qlt.) (5.5)	Development <ul style="list-style-type: none"> Expected^c: Strategic Facilitators: Environmental Approaches to: Environment and Inter-Organization

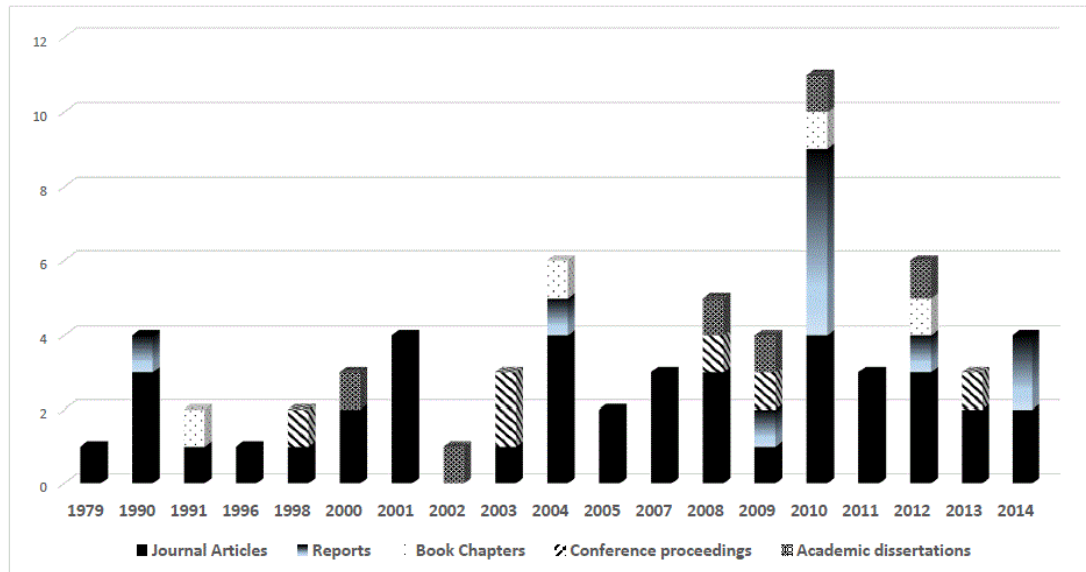
^aClassified according to the World Bank Country and Lending Groups (The World Bank, 2016). ^bPrimary and Secondary. ^cBenefits (Expected or Realized): Operational = Operational Efficiency; Service=Service Delivery; Strategic=Strategic Orientation; Empowerment=Empowerment of Managers and Employees, Compliance=Statutory Compliance.

Abbreviations: SS=Social Science; HRH=HR for Health; HO=Health Organization; Qlt.=Qualitative; Qnt.=Quantitative; NHS=National Health System; Int.=International; HRIMS=Human Resource Information and Management System; Gen.=Generic IS; Ded.=Dedicated IS; N.S.=Not specified; N/A=Not applicable

3.4.2 Analysis of previous studies

Included articles were published between 1979 and 2014. More than half entered the literature within the last decade, peaking in 2010, when 11 were published (see Figure 6).

Figure 6. Types of publications on HRIS by year



Out of 68 included publications, the clear majority (n=41) were journal articles. To confirm the observation that HRIS in healthcare is a multidisciplinary topic (Tursunbayeva et al., 2015), journal articles were first classified into subject areas according to the Scimago Journal ranking portal (Scimagojr) and afterwards using broader discipline categories such as health, ICT and social science. Nine articles were classified manually, as the journals were not covered by Scimagojr. 29 articles (71%) were published in a single discipline: 18 in health (44%), nine in social science (22%), and two in ICT (5%). Just under a third (29%) were published in multidisciplinary journals, including five covering ICT and health

(12%), three covering health and social science (7%), and four covering social science and ICT (10%).

3.4.2.1 Country

The majority of studies were conducted in high-income countries (see Table 1):

- 17 in Europe: four in Netherlands and the UK respectively; three in Finland; two in Ireland; and one in Greece; Norway; Spain and Turkey respectively;
- Nine in North America: seven in the US and two in Canada; and
- One in Australia (as several authors studied this case it was classified as one study).

Only four studies were conducted in Asia (two in Pakistan; and one in India and Taiwan respectively), six in Africa (two in Kenya; one in Malawi; Uganda; and Tanzania respectively; and another one covering nine African countries). One study was conducted in South America (Brazil), and one in the Middle East (Saudi Arabia). Three studies either involved several countries across different regions or didn't specify the countries covered.

3.4.2.2 Unit of analysis

Although diverse health organizations were represented, more than half included studies focused on hospitals in high-income countries, typically taking one hospital as their unit of analysis. Only one study focused on a primary health organization (see Table 1). Studies in low-income countries mostly reviewed

country-wide HRIS systems and/or systems developed, implemented and used by Government Departments of Health or professional organizations.

3.4.2.3 Research design and study quality

Most studies (n=24) adopted qualitative methods. Nine employed quantitative designs, while eight used mixed methods. One study was a systematic literature review. Second review identified by the conducted search did not meet the inclusion criteria; it focused on various ICTs enabling continuing professional development of HR for health, and e-learning was out of the scope of this review (see Tursunbayeva et al., 2015).

Descriptive studies were excluded at the full-text review stage. None of the qualifying studies received a maximum score of 8 on quality assessment. Those scoring highest were quantitative studies and postgraduate research theses; those scoring lower did not adequately explain their units of analysis, research methodology or sources of potential bias. Of the qualitative studies, very few scored higher than 6 (see Table 1 and Tursunbayeva et al., 2016 for details).

3.4.2.4 Theoretical frameworks

Over half of the studies (n=23) did not specify any theoretical perspective. The other 19 referred to a diversity of frameworks, mostly specifying only one (see Table 2).

Table 2. Theoretical frameworks referred to in qualifying studies

Category	Framework	Study
HR and HR related	Concept of Experiential Learning	S3
	Central Principles of HRM	S22
	Personnel as resource in HRM theory	S23
	HRIS impact through drawing from motivation in organizational behaviour and theory of work performance	S33
Innovation and Change	Diffusion of innovations	S10
	Theoretical models of organizational change	S11
IS and IS related	InnoDiff model based on the model for IS success	S1
	Framework of impacts of technology implementation	S8
	Technology Acceptance Model	S9
	Corporate information factory	S18
	System development life cycle	S21
	Concept of mindfulness to develop the concept of preparedness in ERP implementation	S29
	Process-centric role of ICT in terms of its impact on business value	S36
Specific combinations of HR and IS concepts	Conceptual framework developed by WHO Study Group which links 3 components: (1) decision-making in the development of HRH; (2) research, and (3) the IS	S42
	The role of HRM in ICT implementation	S3
	Framework for goals for ICT use for HR	S19
	Framework for ICT effects, enriched with the concept of organizational object, and integrates perspective on emergence and enacted practices	S21
Other broad management /business	Structuration Theory	S3; S7
	Management strategies	S6
	The game-theoretic model	S6
	Evaluation framework for business process projects	S14
	Knowledge sharing concept	S15
	Evidence-based healthcare	S23
	Emancipatory principles and the principles of Critical Social Theory	S38
Does not specify	S2; S4; S5; S12; S13; S16; S17; S20; S24; S25; S26; S27; S28; S30; S31; S32; S34; S35; S37; S39; S40; S41	

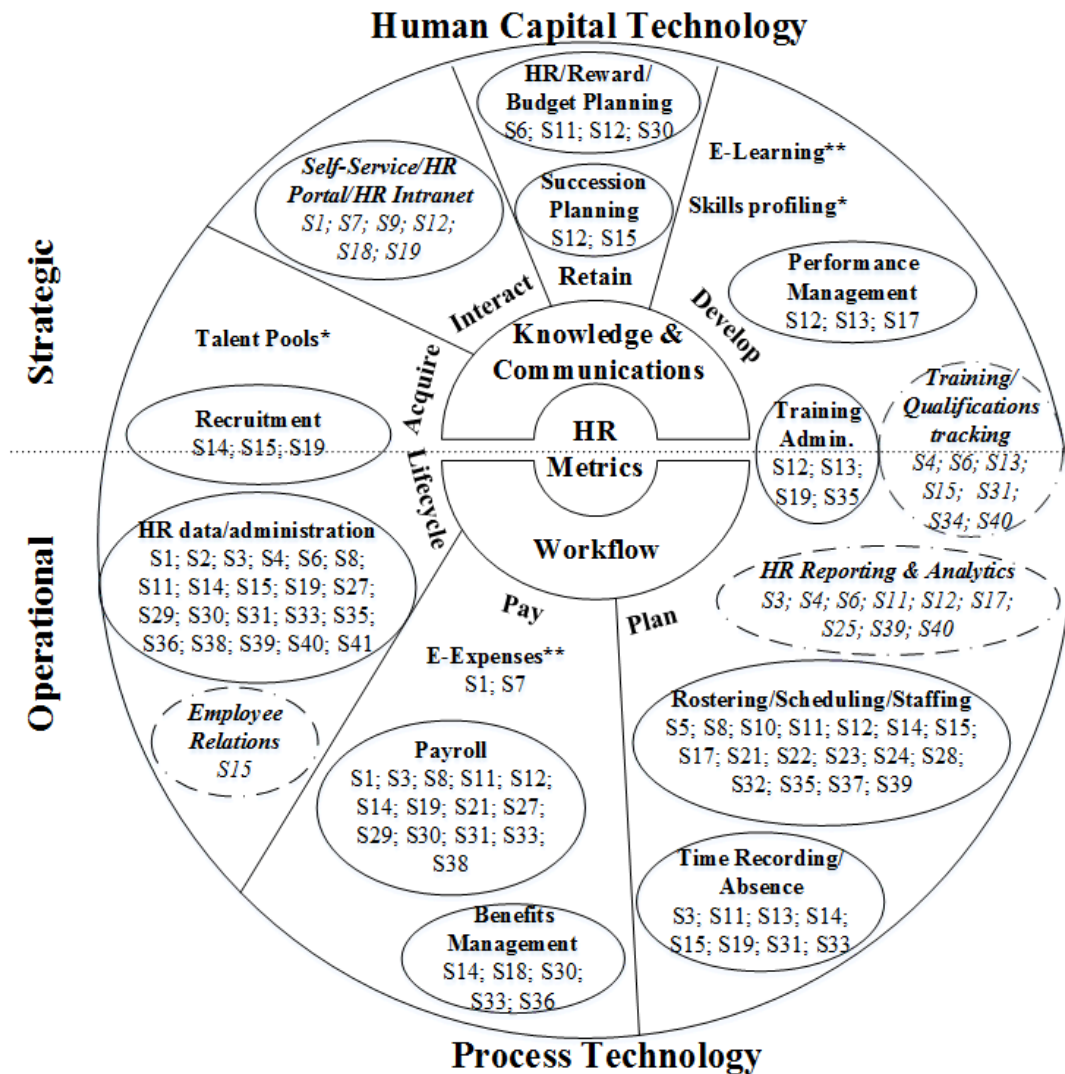
3.4.2.5 HRIS types and their functionalities for HRM practices

Most qualifying studies (n=21) examined dedicated HRIS systems, comprising one or several modules for supporting particular HRM practices. 16 studies focused on generic, integrated organizational systems, including modules dedicated to HRM practices. Five did not clarify whether the HRIS were dedicated or components of generic systems (see Table 1).

Descriptions of ICT for managing HR in health organizations lacked a common terminology (see Table 1). Organizational systems that included HRM functions were commonly described as ERP (n=3), patient classification system (n=3) or Intranet (n=2). Dedicated systems were described as HRIS (n=7), Payroll/Salary systems (n=4) or electronic-HRM(S) (n=2). HRIS (n=3) was used most frequently in studies not specifying whether the system was dedicated or generic.

HRIS support various HRM practices in health organizations. However, as shown in Figure 7, most qualifying studies focus on Operational HRM practices (e.g. HR administration or scheduling).

Figure 7. HRM practices examined in the included studies⁴



3.4.2.6 HRIS users

HRIS are designed for a variety of users. The most commonly mentioned user groups were: health sector leaders/decision-makers (n=6), hospital management,

⁴ *Not mentioned in any of the qualifying studies; **Out of scope of this review (please see Tursunbayeva et al., 2015).

Solid line ovals: existing Fosters' e-HRM landscape categories. Dashed line ovals, text in Italic: categories added to Fosters' e-HRM landscape.

HR department/HR professionals, nurses, nurse managers/administrators, and employees (all with n=5). Less commonly mentioned were health organizations, government//professional authorities, line managers (all with n=3), staffing clerk/coordinator (n=2), clinicians, donor agency, internal temporary employment agency, rural primary care teams and nurse educators (all with n=1). Seven studies did not specify any HRIS user categories.

3.4.2.7 Innovation stages

Innovation stage was classified based on my interpretation of studies' aims and findings, rather than authors' explicit statements, which often bore little resemblance to the stages described in the study.

Half of the studies focused exclusively on a single innovation stage (n=21), mostly on HRIS use (n=17), with two studies each focusing on either development or implementation. The other half (n=21) encompassed several innovation stages, nine covering development, implementation and use, five development and use, five implementation and use, and two development and implementation. Table 3 indicates the innovation stages covered and shows that the studies focused mainly on: Approaches to HRIS use; Factors of influence during HRIS implementation; HRIS outcomes, such as realized benefits; and Drivers for HRIS.

Table 3. Innovation stages examined in the included studies

Category		Development	Implementation	Use
Expected Benefits		S8; S9; S11; S16; S18; S19; S20; S21; S26; S28; S29; S31; S32; S35; S38; S42		
Factors of influence	Facilitators	S21; S28; S31; S38; S42	S3; S6; S10; S11; S19; S20; S21; S28; S32; S37	S3; S4; S10; S20; S25; S28; S35
	Barriers	S35; S38	S1; S3; S5; S6; S10; S11; S14; S20; S21; S29; S38	S2; S3; S7; S8; S10; S41
	Generic	S8; S10	S5; S8; S11; S19	S21
Approaches to		S21; S30; S38; S42	S6; S8; S11; S14; S21; S29; S32; S37; S38	S2; S5; S8; S18; S20; S21; S22; S23; S24; S25; S26; S27; S31; S32; S34; S37
Recommendations		S21	S7; S9; S21	S9; S21; S25; S27; S30; S32; S34
Outcomes	Realized Benefits			S1; S2; S4; S5; S9; S12; S13; S17; S18; S19; S23; S25; S28; S32; S33; S34; S36; S37; S39; S40
	Satisfaction			S5; S8; S9; S15; S17; S27; S28; S32; S35
	Generic			S7; S9; S11; S21
	Downsides			S9

3.4.2.8 Drivers and realized benefits

All studies described HRIS implementation as being driven by expected benefits or goals. The most common related to *Strategic Orientation* - being able to use information about HR needs and performance for evidence-based decision making, to inform HRM, policy and planning, or as a means of migrating to a centralized, enterprise-wide HR shared services approach. This was followed by *Operational Efficiency* - reduction and control of costs, automation or augmentation of manual processes, time saving and reduced bureaucracy. Improvements in *HR Service Delivery* were also expected, such as identifying current levels of provision, resolving issues with external service providers and/or increasing the quality of information in HRIS. Other expectations driving implementation included *Standardization* of systems, processes or data, *Empowerment* of Managers and/or Employees, *Compliance* with statutory requirements for workforce data, and helping to *manage macro organizational changes*, such as a planned hospitals merger. No evidence was available to support the claim that health organizations adopted HRIS to improve their *Organizational Image*, as suggested in Parry & Tyson's (2011) framework.

The most commonly realized benefits of HRIS implementation related to *Strategic Orientation* and *Operational Efficiency* Improvements, followed by the *Empowerment* of Managers and Employees, Improvements in *Service Delivery*, *Standardization* and *Compliance* with regulatory requirements. Another was improvement in *patient care* through facilitating minimum standards of nursing care (Lin et al., 2010). One study reported that hospitals using HRIS had lower rates of vascular catheter urinary tract infection (Spaulding, 2012). *Generation of*

interest from other countries (IntraHealth International, Inc., 2009) and *improved ICT infrastructure* (Altuwaijri & Khorsheed, 2012) were also reported as beneficial outcomes.

Only a few studies (n=5) reported whether projects had achieved benefits. These found that HRIS did not influence *Operational Efficiency* (n=3), *Strategic Orientation* (n=1) or *Service Delivery* (n=1).

Only one study (S9) reported adverse effects of HRIS implementation within organizations such as negative influence on perceptions of HR roles and increased time investment for supervisors for associated with new HRIS processes, although one (S21) described a region-wide HRIS project as a “catastrophic failure” (Chesterman, 2013), with negative consequences for contractors and government, including staff strikes and the Minister of Health’s resignation.

3.4.2.9 User satisfaction

A few studies reported users being satisfied with the system itself (n=3), its functions (n=1) and the information it provides (n=4), although one (n=1) noted dissatisfaction with new HRIS procedures and forms. Several described HRIS satisfaction as being dependent upon ease of use (n=2), types of users (n=2), users’ familiarity with the system, time required to judge systems, whether systems reflect true workload, and time-in-use; satisfaction increasing with evolving user capabilities and organizational adaptation (the latter all with n=1).

3.4.2.10 Factors shaping HRIS development, implementation and use

Facilitators and barriers were reported across innovation stages according to the Kwon and Zmud (1987) framework (see Table 4). Success was influenced primarily by project-related factors, including governance structure, approaches to project management and quality of execution, and by individual factors such as stakeholders' political behaviours and user involvement. Organizational factors, including organizational size, diversity, culture, degree of centralization, and availability of resources, were the most significant barriers. Some studies described technological barriers, including breadth of system functionality, degree of local configuration, and interoperability. Barriers associated with existing HR processes were also mentioned and several studies recommended simplifying such processes prior to HRIS introduction, although none reported any evidence of this having facilitated HRIS projects' success. Macro-environmental influences, such as political reforms and inter-organizational relationships, were considered very little.

Table 4. Summary of influential factors mentioned in the included studies

Factors of influence	FACILITATORS		
	Development	Implementation	Use
Technology	-	S3	S3; S28; S35
Organization	-	S3; S6; S10; S20	S3; S10; S20; S25; S28
Project	S21; S28; S31; S38	S6; S19; S21; S28; S32	S4; S28; S35
Environment	S42	S20	S20; S25
Task	-	-	-

Inter-Organization	-	-	-
Individual	S21; S28	S3; S11; S19; S21; S28; S32; S37	S3; S28
BARRIERS			
Technology	-	S10; S14; S20; S21	-
Organization	S35; S38	S3; S5; S6; S10; S11; S14; S20; S21; S38	S3; S7; S10; S41
Project	-	S1; S11; S14; S21; S29	S2; S7; S8
Environment	-	S20; S21	S2
Task	S38	S14; S21	S7; S10; S41
Inter-Organization	S38	S14; S21; S38	-
Individual	S35	S1; S3; S11; S14; S20; S21	S2; S3; S7; S8; S41
GENERIC			
Technology	S8; S10	S19	S21
Organization	S8	S11	S21
Project	-	S5	S21
Environment	-	-	-
Task	-	-	-
Inter-Organization	-	-	-
Individual	S8	S5; S8; S11	-
APPROACHES TO			
Technology	S30	S6; S11; S21; S32; S38	S2; S5; S8; S18; S24; S25; S26; S27; S32; S34; S37
Organization	-	S29	S26
Project	S38	S6; S8; S11; S14; S21; S29; S38	S21; S31
Environment	S21; S42	-	S26
Task	-	S37	S20; S22; S23;

			S26; S27; S31
Inter-Organization	S30; S38; S42	S8; S14; S21	S31
Individual	-	S8; S32	S5; S31; S32
RECOMMENDATIONS			
Technology	S21	S21	S21; S25; S34
Organization	S21	S7	S21; S32
Project	S21	S7; S9; S21	S9; S21; S27; S32
Environment	S21	-	S32
Task	S21	S7; S9; S21	S9; S21; S27; S30
Inter-Organization	-	S21	S21
Individual	S21	S7; S9	S21; S27

3.5 Summary of the results

The primary aim of this review was to inform the research strategies for conducting empirical case studies for my PhD research. Thus, it helped to discover that research in this area ranges across disciplines and varies widely in terms of its objectives, methods, theoretical orientation, quality and language. As was expected, the evidence-base is sparse compared with clinical IS research. Most studies focus, somewhat uncritically, on the use and realized benefits of HRIS in practice, rather than socio-contextual or technological factors influencing their development, implementation success, or impacts on strategic decision-making or cost-effectiveness. Most research comes from higher income countries and examines small-scale systems in individual hospital settings. Nevertheless, several higher quality studies were found, including one national program evaluation. It was possible to adapt and apply existing theoretical frameworks to

help organize and interpret the evidence, suggesting that it may be also possible to build a more integrated body of research in this area.

The plethora of terms used to describe HRIS, and variation across disciplines, suggests a lack of consensus and makes it difficult to build a coherent evidence base. This may explain why a previous systematic review on HRIS in health (Riley et al., 2012) did not identify any research prior to 2000, whereas my review, using a broader range of search terms, found seven such studies. Therefore, it is important that future researchers go beyond obvious keywords (e.g. HRIS), when undertaking background research for new projects (full list of relevant keywords is provided in Tursunbayeva et al., 2016).

Purely descriptive research was excluded at the screening phase; hence the methodological quality of the included studies was higher than in the literature as a whole.

Most included studies were published in health journals but also many in social science and ICT journals, with some crossing disciplines. Over half were qualitative and of those reporting quantitative data none evaluated cost-effectiveness or return-on-investment. Given the considerable expenditure on HRIS within the health sector this gap is surprising, although it reflects a broader evidence deficit in the health informatics literature (Shekelle & Goldzweig, 2009; Black et al., 2011).

The use of relevant theories was an important consideration for my assessment of HRIS research. Although many studies mentioned one or more theoretical frameworks, half did not, confirming observations from a previous literature review on HRIS (Strohmeier, 2007). Most of the theoretically-informed studies

were published in social science journals, or as academic dissertations. Of the studies mentioning a theoretical perspective, nearly all referred to a different one. As such, in line with clinical systems studies which seldom build on prior research (Boonstra, Versluis, & Vos, 2014), studies on HRIS research in health mostly represent applied projects and do not advance theoretical understanding of HRIS development, implementation or use.

The focus of HRIS research has varied between countries, in terms of systems, contexts and priorities. Most studies from high-income countries have focused on small-scale systems in individual hospital settings, with the key users being internal personnel and managers (clinical/non-clinical), although there are notable exceptions, such as a major program evaluation in Australia (e.g. Thite & Sandhu, 2014). Moreover, nearly all user satisfaction studies have come from high-income countries.

Research from lower income countries tends to concentrate on Open Source HRIS for collecting data at the national and regional levels, focusing on health leaders, decision and policy makers as the primary system users. Most studies, especially those from low-income countries, prioritize operational aspects of HRM practices, despite 2001 WHO's recommendation that effective HR departments should also undertake managerial or strategic HR activities (Bach, 2001).

Overall, there is a general scarcity of HRIS research in health from East Asia and Pacific, Eastern Europe, Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia and Sub-Saharan Africa. Moreover, there is no study that compared HRIS projects across countries, supporting the call for more cross-country comparisons of ICT research in health (e.g. Cucciniello, 2011).

The majority of existing HRIS studies have concentrated on the use of systems in practice, across several innovation stages. Very few focused on the development stage, and even fewer reported measurable outcomes of HRIS projects. While some studies differentiated between expected and realized benefits, there was no rigorous evaluations that compared both systematically. The focus on usage compared to development and impact suggests that the importance of user-centred design for the success of health IT projects, and the necessity of evaluation have not been fully acknowledged.

3.6 Conclusions

In summary, this chapter confirms that studies on HRIS in health are under-represented in the interdisciplinary literature, which prioritize studies on clinical IS, despite the potential of HRIS to contribute to information-driven, learning health systems and the substantial financial investments that are being made in them. Most research is based on softer forms of evidence and there are important gaps in knowledge about the expected benefits and actual outcomes of HRIS initiatives or socio-contextual or technological factors influencing their development or implementation success. Moreover, existing studies on HRIS in health mostly represent applied projects and do not advance theoretical understanding of HRIS development, implementation or use. Finally, there is no study that compares HRIS projects across countries.

In order to address the aforementioned literature gaps and to answer the research questions this PhD research addresses, I set out to study:

- The expected and actual outcomes of HRIS projects in different contexts, as well as the influence of the socio-technical factors identified in the systematic review (see Tursunbayeva et al., 2016) on these projects;
- The processes of HRIS development and implementation in both contexts.

The theoretical frameworks that guided this empirical research are described in the next chapter.

4. Chapter 4

CONCEPTUAL FRAMEWORK

4.1 Introduction

The findings of the systematic review of published literature on HRIS in health presented in the previous chapter (Tursunbayeva et al, 2016), revealed that the existing research pertaining to HRIS is predominantly descriptive and often atheoretical. There are few systematic evaluations of expected benefits from HRIS projects or assessments of their actual consequences. Moreover, little is known about how healthcare organizations engage in the development and implementation of these technologies or how diverse socio-technical factors (e.g. human, organizational or technological) influence one another and together shape HRIS projects and their outcomes. These have been well described in the field of Science and Technology studies, and within theoretically-informed studies of the adoption of other technological innovations in health contexts (e.g. Robert, Greenhalagh, MacFarlane, & Peacock, 2009). Such research recognises that, whilst vendors and purchasers of such systems often have fairly mechanistic expectations of the inputs and outputs of ICT, the uses and consequences of innovations often emerge unpredictably as a result of complex social interactions amongst the human actors involved, their responses to and interactions with new systems, and the organizational context in which they are situated (Robert et al., 2009). As a result, identical technologies often lead to different outcomes in

different settings (Barley, 1986). The introduction of a new information system, particularly at scale, often necessitates significant re-organization of related working practices, process and activities (e.g. Ure et al., 2011). Thus, in order to effectively examine the process of HRIS development and implementation, and to compare its expected benefits versus actual outcomes, which is the focus of this study, the approach has to account for the interaction between technological, social and organizational systems, for which a theoretically-driven and context-sensitive approach is likely to be most fruitful (see Robert et al., 2009).

This chapter highlights the theoretical underpinnings of the approach adopted here to the study of HRIS implementation in health, and outlines the gaps in existing knowledge. The chapter is divided into main two parts reflecting the two-main research aims I focused on exploring in my PhD research: (1) the benefits of HRIS innovation and (2) the role of context in shaping HRIS innovations. Thus, the first part of the chapter reviews theoretical concepts related to HRIS benefits and factors shaping IS innovations, which were used to understand expected benefits from HRIS and actual project outcomes, as well as factors that affected them. In the second part of the chapter I follow with an analysis of Institutional IS research published to date and institutional theory sub-frameworks which were used to examine the processes of HRIS development and implementation.

Although this chapter outlines the final theoretical frameworks used in this study, chapter 5 describes how the decision about adopting them was actually made.

4.2 HRIS benefits and factors shaping IS innovations

Organizational scholars have become interested in understanding the influence of technology on organizations since 1960th (Orlikowski & Barley, 2001), while the interest in studying benefits of IS and factors that influence their implementation started growing since the early 80s.

Some of these scholars have started exploring specifically the effects that IS has on HR (e.g. Lepak & Snell, 1998). Thus, in order to explore the benefits (whether expected or realized) associated with the adoption of HRIS I draw specifically from the HRIS research in general, and from the systematic review of research on HRIS in healthcare context. In order to examine the factors that influence the adoption of HRIS I draw on factors of influence frameworks that are widely used in generic IS research.

4.2.1 Frameworks on HRIS benefits in health settings

HRIS research has identified a number of benefits specific to HRIS including strategic orientation, operational efficiency, improving service delivery, empowering managers and employees to perform some of the HR functions (Lepak & Snell, 1998) and standardization of HR processes across organization (Ruel et al., 2004). A more recent study involved the empirical evaluation of these expected and realized HRIS benefit categories in ten organizations from diverse sectors in the UK and added a further category - improving of organizational image benefit (Parry & Tyson, 2011) (see Table 5).

HRIS introduction, however, can also cause unintended consequences. Such consequences can be either positive, reflecting a benefit for the organization that

was not foreseen prior to adoption, for example an organization that planned to achieve only cost saving, standardized also HR processes due to the new HRIS introduction, or negative such as, for example, decrease in internal customer satisfaction level due to depersonalization of HR services provision caused by the introduction of HRIS self service module (Parry & Tyson, 2011).

The systematic literature review of HRIS in health described in the previous chapter confirmed the generic expected and realised benefit categories from Parry and Tyson's (2011) framework, and identified two further categories of expected benefits including compliance with regulatory requirements (e.g. for reporting workforce information), and help in management of macro organizational changes (e.g. planned hospitals merger). Moreover, it also identified four further categories of realized benefits, including compliance with regulatory requirements, improvement in patient care through facilitating minimum standards of nursing care (Lin et al., 2010) and reduced rates of vascular catheter urinary tract infection in the hospitals with HRIS (Spaulding, 2012), generation of interest from other countries (IntraHealth International, Inc., 2009) and improved ICT infrastructure (Altuwajri & Khorsheed, 2012).

The final structure of expected and realised benefits as identified based on the conducted literature review is depicted in Table 5.

Table 5. HRIS benefits and recipients of HRIS benefits

Literature Sources	Expected Benefits	Realized Benefits	Main benefit recipients' in focus
Lepak and Snell (1998)		Strategic Orientation Operational Efficiency Service Delivery Empowerment of managers and/or employees	HR managers
Ruel and colleagues (2004)		+ Standardization	HR Department ; Employees
Parry and Tyson (2011)		+ Improving Organizational Image	Organization
Systematic Review on HRIS in Health	<ul style="list-style-type: none"> • Compliance with regulatory requirements • Management of macro organizational changes 	<ul style="list-style-type: none"> • Compliance with regulatory requirements • Improvement in patient care • Generation of interest from other countries • Improved ICT infrastructure 	A great variety of users/user groups

The findings of the systematic literature review also revealed that research on expected and realized benefits is often isolated in existing literature (Meyer & Goes, 1988). This reluctance to engage in a clear evaluation of the outcomes of IS innovation highlights how challenging it is to assess the realized benefits of IT innovation. As such, I set out to address this research gap and examine the expected benefits of introducing a new technological innovation – HRIS – to the actual outcomes and unintended consequences achieved (RQ1).

Finally, the results of the conducted systematic literature review revealed that both HRIS and the data generated from the implementation of HRIS in health organizations can be used by a great variety of users/user groups ranging from hospital managers, clinicians, nurses and/or HR professionals. As the tasks performed by these audiences vary, it is likely to suppose that the different audiences would form their own perceptions of the benefits associated with HRIS. However, existing research on HRIS benefits (Lepak & Snell, 1998; Parry & Tyson, 2011; Ruel et al., 2004) generally either fails to differentiate between different users, or tend to focus almost exclusively on a particular user category. For example, Parry and Tyson (2011) identified HRIS goals and outcomes at the organizations level without distinguishing between the types of actors, while Lepak and Snell (1998), and Ruel and colleagues (2004) focused primarily on HR professionals, mentioning only in passing the benefits accrued by employees (Ruel et al., 2004). While such studies advanced our understanding concerning the benefits associated with HRIS implementation, they do not provide us full picture on the expected and realized benefits for different stakeholders. Understanding whether and how the perceptions of HRIS benefits vary according to the type of stakeholder is important to clarify the kind of expected benefits that motivate different stakeholders to accept HRIS initiatives, and the kind of realized benefits and actual beneficiaries of these initiatives. In order to address this gap, the second research objective of this research is to differentiate the identified expected benefits and pilot outcomes according to the various HRIS project stakeholders and/or user groups (RQ2).

4.2.2 Frameworks on factors shaping the outcome of IS innovations

The most comprehensive framework for examining the factors that influence the adoption of technologies in organizations is the TOE framework (DePietro et al., 1990). TOE differentiates between three categories of factors:

- Technology, including specific features of the technology;
- Organization, including the characteristics and nature of the adopting organizations; and
- Environment, including the characteristics of the macro level at which the technology is adopted.

In the context of IS, in a manner similar to the TOE approach, Kwon and Zmud (1987) identify five categories of factors that shape IS adoption in organizations: three similar to the TOE framework including environmental, technological and structural (similar to the organizational factors in the TOE framework); individual factors, such as characteristics of the individual involved in the adoption of the technology; and task factors, such as the nature of the tasks for which the IS is used (Cooper & Zmud, 1990). Overall, DePietro et al.'s (1990) TOE framework, and more rarely the Kwon and Zmud (1987) expanded version, is common in the IS literature (Bunduchi & Smart, 2010), and has previously been applied to HRIS adoption generally confirming the applicability of the framework to research on HRIS (e.g. Troshani et al., 2011).

Similarly, the results of the systematic literature review on HRIS in health confirmed the application of the expanded Kwon and Zmud (1987) framework to HRIS in health. In addition, this review identified two further factors that affected the adoption of HRIS projects in health organizations: (1) inter-organizational

factors such as the relationship between the adopting health organization and the HRIS vendor (e.g. Waring, 2000), and (2) HRIS project factors including project characteristics such as governance structure, approaches to project management and quality of execution (Parry & Tyson, 2011). While all of the aforementioned factors have been shown to influence the adoption of IS in general (and HRIS in health in particular), it is still unknown which of these factors influence the transformation of expected into realized benefits. I thus draw from an expanded version of Kwon and Zmud's (1987) framework and augment it with the two factors identified from my systematic literature review in order to examine the factors that influence the transformation of expected HRIS benefits into realized benefits (RQ3).

4.2.3 Summary of conceptual frameworks for HRIS benefits and factors shaping the outcome of IS innovations

The aforementioned theoretical frameworks and research questions should help to evaluate the expected benefits from HRIS projects, assess their actual consequences, and explore the socio-technical factors that influence this transition. However, previous research in the field of Science and Technology recognized that in order to effectively compare expected benefits versus actual outcomes - which is the focus of this study - the processes of HRIS development and implementation should also be examined using a theoretically-driven and context-sensitive approach that can take into account the interaction between technological, social and organizational systems (see Robert et al., 2009).

The next sections will introduce the theoretical framework -institutional theory- adopted to examine the processes of HRIS development and implementation that led to the results presented in this thesis, stating also the main reasons why it was found suitable.

4.3 Institutional theory: Introduction

While the economic and resource-dependency theories that I considered adopting for this part of my research explain organizational behaviour in terms of rational self-interest calculations, institutional theory conceptualises it as the product of the ideas, values and beliefs embedded in the institutional environments in which organizations operate (DiMaggio & Powell, 1983). It posits that, in order to gain legitimacy, prestige, stability, resources or even to survive in these environments, organizations and their personnel often act according to what is perceived to be legitimate, rather than what is perceived as rational in terms of efficiency and performance (Meyer & Rowan, 1977). Therefore, organizations conform to the rules imposed by powerful institutions, which are often defined as regulatory structures, governmental agencies, laws, courts, professions, interest groups and public opinion (Oliver, 1991). These rules are also known as institutional pressures, and institutional scholars also highlighted that they can cause similarity between different organizations that are aiming to obtain legitimacy (DiMaggio and Powell, 1983).

Meyer and Rowan's (1977) influential article re-emphasized the complexity of institutional processes (Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011) and prompted a new approach to institutional analysis. This approach gave

birth to a “new” institutionalism paradigm that stressed that “sources of rationalized myths [pressures] may be in competition if not in conflict” (Scott, 1991, p. 167) and that “expectations of powerful external [institutions] actors are often conflicting, vague and in flux” (Elsbach & Sutton, 1992, p. 700; as cited in Greenwood et al., 2011). This has started to shed light on the importance of institutional environments to organizational behaviour prompting scholars to study the sociotechnical factors that can affect organizations and organizational processes.

Other theoretical frameworks that I considered using in my research include critical management theories that also challenge previous beliefs that organizational decision making is driven only by rational aims to achieve organizational efficiency primarily because it “is an approach to understanding organizations and management practices as the product of social rather than economic pressures. It has become a popular perspective within management theory because of its ability to explain organizational behaviors that defy economic rationality” (Suddaby, 2014, p. 379). However, I chose to proceed with institutional theory: first because the focus of critical management studies is on “the social injustice and environmental destructiveness of the broader social and economic systems that managers and organizations serve and reproduce” (Adler, Forbes, & Willmott, 2007, p. 119) which was not the main focus of my study; second because institutional theory was found to be suitable to respond to the identified research questions inasmuch as it helped me to explore the processes through which institutional pressures shape the development and implementation of an ICT innovation within an organizational setting. I was confirmed in this

decision by the fact that previous scholars have already identified institutional theory as a suitable “critical” (Strohmeier, 2007) theoretical approach.

In fact, in the last few decades institutional theory has become diffused throughout various disciplines, such as sociology (e.g. Meyer & Rowan, 1977) and organizational studies (e.g. DiMaggio & Powell, 1983). Recently, institutional theory has also proved helpful in understanding the development, implementation and use of IS in organizations and how these are affected by diverse institutional forces.

4.3.1 Institutional pressures in DiMaggio and Powell (1983)

Several institutional scholars have expressed their views on institutional norms and requirements – pressures (e.g. DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1995;) and how they cause similarity (also known as homogeneity) in an institutional field. In this section I will provide an overview of the way institutional pressures are conceived in the work of DiMaggio and Powell (1983), chosen for this research because of its suitability to explain the data and previous successful application in IS research.

DiMaggio and Powell (1983) describe three key sources of institutional pressures - coercive, mimetic and normative - that can be imposed on organizations by powerful institutions, and cause their similarity.

Coercive pressures arise from the formal and informal rules, standards or regulations imposed by institutional actors in the wider environment surrounding organizations, such as the need to comply with standards and regulations, or to conform to top-down strategies, such as government deadlines or targets.

Examples of coercive pressures may include government mandates or regulatory agencies. This kind of pressures can either force, persuade or invite organizations to adhere to the institutional requirements.

Mimetic pressures arise from the motivation to imitate other organizations that are perceived to be successful in a similar environment. Thus, it has been observed that organizations try to reproduce the behaviour of other similar organizations from their sector at times of uncertainty or when the goals of a project are too ambiguous. Interestingly, previous research has observed that even innovations are affected by conscious or unconscious organizational efforts to imitate the behaviour of others. For example, “While there certainly are those who consciously innovate, there are those who, in their imperfect attempts to imitate others, unconsciously innovate by unwittingly acquiring some unexpected or unsought unique attributes which under the prevailing circumstances prove partly responsible for the success. Others, in turn, will attempt to copy the uniqueness, and the innovation-imitation process continues.” (Alchian, 1950; as cited in DiMaggio & Powell, 1983, p. 151).

Normative pressure chiefly comes from the informal social norms operating within professional groups. DiMaggio and Powell’s (1983, p.152) interpretation of professionalization concludes that it is a “collective struggle of members of an occupation to define the conditions and methods of their work... and to establish a cognitive base and legitimation for their occupational autonomy”, and also states that professions can also be influenced by coercive and mimetic pressures.

Ruef and Scott (1998), in their longitudinal study using data from 143 hospitals in the US, differentiate between two types of normative pressure: managerial norms

relating to organizational mechanisms, such as accounting practices or rules of personnel conduct, and technical norms, such as expected qualifications and training, work procedures and quality assurance mechanisms. Managerial and technical norms can be concerned with different values. For example, in some healthcare environments, managerial norms may emphasise efficiency and cost containment, while technical norms may prioritize quality of patient care and speciality training (Ruef & Scott, 1998; see also Bunduchi, Smart, Charles, McKee, & Azuaro-Blanco, 2015). Thus, their study concludes that every hospital organization can seek legitimacy in terms of both managerial and technical norms, and that these norms can be complementary or contradictory to each other.

Several or all of these coercive, mimetic and normative pressures can operate at once (Provan, Isett, & Milward, 2004), thus, in attempting to implement a new innovation, organizational actors may be exposed to multiple and conflicting institutional demands (Pache & Santos, 2010). The extent to which each type of pressure is influential also depends on conceptual factors such as the level of uncertainty surrounding a project, the presence of financial incentives, strong policy drivers or legal and regulatory requirements (Sherer et al., 2016).

Being able to align innovations with these institutional demands is crucial to their successful adoption and use (Currie & Guah, 2007; Bunduchi et al., 2015). However organizational actors have agency and may choose to respond to these pressures in various ways in order to gain legitimacy or advance their specific interests.

4.3.2 Organizational actors' strategic responses to institutional pressures

Institutional theory helps to explain the interaction between organizations and the environment they operate in and how organizations address institutional pressures. However, while earlier institutional research (e.g. DiMaggio & Powell, 1983) emphasized the institutional pressures that force actors to comply, recent studies have begun to explore ways in which institutional theory can accommodate the agency of actors. One of the first scholars to develop a conceptual apparatus that allowed theorization of agency as part of institutional theory was Oliver (1991), who suggested that organizations can have active agency, and react differently to the institutional pressures imposed on them. For example, she stated: “Institutional explanations of reproduction and isomorphism emphasize the role of conformity, habit, and convention, rather than organizational power and control, in contributing to stability, and power tends to be attributed to the institutional environment rather than the organization (e.g. DiMaggio & Powell's, 1983, predictions of coercive isomorphism)”.

Oliver (1991) describes five main categories of strategic response that organizational actors can adopt in response to institutional pressures:

- Acquiescence: conforming to institutional expectations;
- Compromise: the organization's attempts to balance, pacify or bargain with external constituents to match conflicting institutional expectations;
- Avoidance: finding strategies to circumvent the need to conform to external pressures;
- Defiance: the rejection of institutional norms; and

- Manipulation: changing the institutional expectations or the sources through which these expectations are exerted.

According to Oliver (1991), the deployment of these responses depends on levels of authority and uncertainty within the organization; for example, a high level of authority favours acquiescence, while low authority coupled with high uncertainty favours compromise and avoidance. The structure of organizations also influences the likelihood of particular responses (van Dijk et al., 2011), for example, a homogenous institutional environment encourages conformity (acquiescence in Oliver's terminology), whereas a diverse environment with multiple institutional logics favours transformation (akin to Oliver's manipulation) (van Dijk et al., 2011). These strategies also vary over time as conditions in the environment change forming patterns of conformity or non-conformity (see Standing, Sims, & Love, 2009).

4.3.3 Analysis of Institutional theory in IS research

As mentioned in the sections above, institutional theory has proved to be helpful in understanding the development, implementation and use of IS in organizations and how they are affected by diverse institutional forces. This section will focus on reviewing the use of institutional theory in IS research drawing from several relevant, recent literature reviews (e.g. DeVaujany, Carton, Mitev & Romeyer, 2014; Mignerat & Rivard, 2009; Weerakkody, Dwived, & Irani, 2009).

These reviews confirmed the popularity of institutional theory with IS researchers, who often deploy it as a comprehensive framework for analysing "how institutions influence the design, use, and consequences of technologies, either

within or across organizations” (Orlikowski & Barley 2001, p.153). For example, the number of reported academic publications employing this framework is constantly growing: Thomson Scientific Database had one paper using this framework in 1988, 17 in 1997, and 80 in 2007 (28 of which were related to IS) (Weerakkody et al., 2009). More than half of these papers were published in management or business journals (Weerakkody et al., 2009).

The institutional IS research focuses on explaining different stages of ICT innovation, a model first described by Swanson & Ramiller (2004), such as comprehension or intention to adopt (including the organizing vision that precedes the decision to adopt the innovation), adoption⁵ (planning for the project, including developing the business proposition and identifying organizational barriers and facilitators), implementation (including practical aspects of data migration, systems configuration or testing, alongside change management processes) and assimilation (integration into workflow and demonstrated usefulness), and can be grouped into three broad sub-categories:

1. Influence of institutional pressures on ICT innovation;
2. Institutionalization process of ICT innovation; and
3. Interaction of ICT innovation and institutions (Mignerat & Rivard, 2009).

Two of these sub-categories (1 and 2) that are relevant to this PhD research are discussed below.

⁵ “Intention to adopt” and “adoption” stages combined are equal to the “development” innovation stage described in the Chapter 3 of this thesis. Thus these terms are used interchangeably in this thesis.

4.3.3.1 Influence of institutional pressures on ICT innovation

DiMaggio and Powell's (1983) popular approach to institutional theory prompted many researchers to adopt their framework for understanding the role of context in shaping the ICT innovation process. Thus by and large institutional IS research focuses on examining the influence that coercive, mimetic and normative pressures or their combinations play during the different stages (comprehension or intention to adopt, adoption, implementation and assimilation) of varied ICT innovations (see Bunduchi et al, 2015 for a discussion) such as ERP or e-HRM (see Table 6 built based on Bunduchi et al., 2015).

Table 6. Exemplary studies focusing on influence of institutional pressures on ICT innovations

Stage	Type of ICT innovation (Author/s, year)	Institutional Pressures and Strategic Responses
Comprehension	Electronic data interchange (Teo, Wei, & Benbasat, 2003) Electronic marketplaces (Son & Benbasat, 2007)	Coercive, Normative, Mimetic=> Acquiescence
Adoption	RP (Phang, Kankanhalli, & Ang, 2008)	Coercive=> Acquiescence
Implementation	Enterprise IS (Gosain, 2004)	Coercive, Normative, Mimetic=> Acquiescence
Assimilation	Web technologies (Chatterjee, Grewal, & Sambamurthy, 2002)	Normative=> Acquiescence
Several stages together	Marketplaces (Standing et al., 2009)	Coercive: =>Comprehension (Defiance) =>Implementation (Compromise or Manipulation)

		=>Assimilation (Avoidance)
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However, very few scholars have focused on studying the influence of institutional pressures over time (e.g. Standing et al., 2009), although this was identified as a promising direction for future research (RQ4) which could provide richer insights into how institutional pressures affect ICT innovations over time (Mignerat & Rivard, 2009). Finally, a majority of the existing studies centred their attention on the “acquiescence” strategic response to institutional pressures, although some note that organizations can adopt different responses (e.g. Gosain, 2004).

4.3.3.2 Institutionalization process of ICT innovation

This sub-category of institutional IS research includes studies that focus on different parts of the institutionalization process of the ICT innovation, associated standards (Backhouse et al., 2006) or practices (Klein & Hirschheim, 1989).

In addition, studies from this sub-category focus on the relationship between different institutions or institutionalization processes (e.g. Cousins & Robey, 2005). The institutions in this context are “not organizations, but rather the institutional context: the technical, social and cultural demands of the environment on the organizations” (Mignerat & Rivard, 2009).

Finally, studies from this sub-category focus on the organizing vision associated with ICT innovation and the role it plays in the institutionalization process of ICT innovation. The concept was developed to explain how institutional processes shape the early adoption of ICT innovations and has been used to account for the

retarded institutionalisation of some innovations during the later stages (Currie, 2004; Swanson & Ramiller, 2004).

Thus, in contrast to the previous belief that “early adoption of innovations is based on local, rational organizational choice, while later adoption is institutionalized and follows taken-for-granted assumptions about what constitutes proper practice” (Tolbert & Zucker, 1983; as cited in Swanson & Ramiller, 1997), Swanson and Ramiller (1997) argue that organizations create an image for the innovation they are planning to adopt (e.g. how innovation should be used within the organization or what kind of benefits it will bring for different categories of stakeholders) early in the beginning of the innovation adoption process. Thus, they also state that “An interorganizational community, comprised of a heterogeneous network of parties with a variety of material interests in an IS innovation, collectively creates and employs an organizing vision of the innovation that is central to decisions and actions affecting its development and diffusion. That organizing vision represents the product of the efforts of the members of that community to make sense (Weick, 1995) of the innovation as an organizational opportunity. In so making sense of the innovation, the community in effect also defines it and creates it” (Swanson & Ramiller, 1997, p.459).

This organizing vision is created and used by a wide range of inter-organizational actors, who can continue to shape it throughout the life-cycle of innovation, and if “The organizing vision remains underdeveloped after early adoption, later diffusion and institutionalization of the innovation is likely to be retarded” (Swanson & Ramiller, 1997, p.458). The organizing vision is typically underdeveloped at the early stages of a new project, and develops as the

technology and actors' understanding of its possibilities co-evolve. An organizing vision facilitates the interpretation of the innovation by actors tasked with delivering it, helps to legitimise the innovation within the organizational context, and helps to mobilise support for realising the effective delivery and adoption of the innovation (Swanson & Ramiller, 1997).

“Organizing vision” includes the business problematic, or the organizational issues that the innovation is supposed to solve, the core technology itself, and the organizational practices associated with the innovation. Marsan, Pare and Beaudry (2012) found that when organizational stakeholders have a positive image about innovation, the organizations are mostly in favour of pursuing innovation adoption. Finally, Bunduchi and colleagues (2015) argue that competing organizing visions can be created between different organizational fields when different stakeholders form different expectations about the adopting innovation.

This concept was initially applied to understand the development of technology at the level of the institutional field. However, recently, it has also been employed to explain the adoption of innovation at inter-organizational (Lyytinen & Damsgaard, 2011) and organizational (Bunduchi et al., 2015) levels. I employ the latter approach in my research because I focus on the components of the organizing vision that actors within the studied health organizations created regarding the HRIS in question.

4.4 Conclusion

Existing literature on generic HRIS, as discussed above, tends either to focus on user expectations from HRIS or on achieved benefits of implemented HRIS

innovation. This is also true for research on HRIS in health (Tursunbayeva et al., 2016). Therefore, in my research I aimed to address this research gap and examine not only the expected benefits of introducing HRIS but also the actual project outcomes and unintended consequences (RQ1). Moreover, as previous studies that focused specifically on benefits from HRIS do not provide the full picture on the expected and realized benefits for different stakeholders, there is a lack of understanding regarding what kind of expected benefits motivate different stakeholders to accept and proceed with HRIS initiatives and what kind of benefits these initiatives actually achieve (especially in the health sector). Thus, the second research question (RQ2) that I set out serves to differentiate the identified expected benefits and actual project outcomes according to diverse HRIS project stakeholders and/or user groups.

It is already known that adoption of technology innovation in organizations is influenced by five factors related to the technology, organization, environment, task and individuals. However, the results of the systematic literature review on HRIS in health identified in seven factors that can affect HRIS projects in health organizations, the two additional factors being inter-organizational (e.g. relationship between implementing organization with vendors and suppliers) and project-related (e.g. governance structure, approaches to project management, and quality of execution) matters. Thus, in order to enhance the current understanding of the adoption of HRIS in general, as well as HRIS in health organizations in particular, I aimed to empirically examine the factors that can influence the realization of initially envisioned HRIS benefits (RQ3).

Finally, as recognised in the field of Science and Technology studies, in order to effectively examine the processes of IS development and implementation that led to these outcomes, I used a theoretically-driven and context-sensitive approach (see Robert et al., 2009), i.e. I draw on institutional theory to examine the role of context in shaping HRIS innovations.

As discussed earlier, developments in institutional theory over the past 30 years have provided a much more nuanced understanding of organizational behaviour, recognising both the existence of multiple and often conflicting institutional demands (Friedland & Alford, 1991; Pache & Santos, 2010) and the agency of individuals and teams capable of actions to retain, adopt or discard the norms, values and expectations influencing their organizational behaviours (Greenwood & Hinings, 1996; Greenwood, Díaz, Li, & Lorente, 2010). However, only a handful of IS studies consider changes in responses over time (Standing et al., 2009), examining how innovations are shaped by conflicting institutional pressures embedded in different institutional logics (Currie & Guah, 2007) or investigate how actors respond to multiple or conflicting institutional pressures (e.g. Bunduchi et al., 2015).

Thus in my research I also set out to contribute to institutional literature by exploring the processes through which institutional pressures shape the development and implementation of an ICT innovation within an organizational setting over time (RQ4). I also draw on the concepts of the organizing vision (at an organizational level) and strategic responses, in order to understand how organizational actors interpret the nature and goals of the innovation and respond to the various institutional pressures associated with them. Here I draw on the four

stage model of IS innovation (comprehension, adoption, implementation and assimilation) which has been successfully adapted for studies examining IS from an Institutional Theory perspective (Mignerat & Rivard, 2009). However, since one of my case studies concerns a multi-site IS programme that has not yet been fully implemented I focused on the first three of these stages: intention to adopt, adoption and implementation.

5. Chapter 5

METHODOLOGY

5.1 Introduction

This chapter discusses the methodology employed in this study, and describes how it was used to apply the conceptual (theoretical) frameworks outlined in the previous chapter (Chapter 4). It also specifies how the research design and cases for study were chosen, as well as gives reasons for the approaches adopted to data collection and analysis. Moreover, it includes considerations on ethical issues relevant to this research, and, last, some critical reflections on my role as a researcher, and on the quality of this study.

5.2 Research questions

The main objective of this research is to compare the expected and pilot outcomes of two HRIS projects, and empirically to examine the impact of the factors identified as likely influences on these in the systematic review. I also aim to examine the processes of HRIS development and implementation in both contexts.

The following specific research questions were set out in order to achieve the aforementioned research objectives:

- *RQ1: What are the expected benefits, actual outcomes and unintended consequences of introducing a new technological innovation – HRIS?*

- *RQ2: What are the expected benefits and outcomes for diverse HRIS project stakeholders and/or user groups?*
- *RQ3: What are the factors that influence the transformation of expected HRIS benefits into realized benefits?*
- *RQ4: How do institutional pressures shape the development and implementation over time of an ICT innovation within an organization's setting over time?*

5.3 Research methodology

There are two primary research paradigms that differ in their philosophical worldview, understanding of the social (e.g. in a focus on facts or on their meaning) and technical methods (e.g. whether samples are large or small): the former is often dubbed positivist and the latter non-positivist, roughly equivalent to the distinction between quantitative and qualitative research (Creswell, 1997; Easterby-Smith, Thorpe, & Lowe, 1991). Thus, any empirical research should start from choosing which of these paradigms to follow. This decision mainly relates to the nature of the research and its research questions. A positivist approach should be adopted when the focus is on the facts, the causal relationships between phenomena, and testing hypotheses, while a non-positivist approach is appropriate primarily when the focus is on meanings, and on an understanding of the role played by actors' interpretations of, and motivations regarding, the processes in which they are involved (Stake, 1995).

The majority of existing studies on ICT follow the positivist paradigm (Kauber, 1986). However, they are often criticized because they neglect the context in

which they are situated (Cucciniello, 2011), whereas it has been widely recognized that the uses and consequences of technological innovations emerge unpredictably through complex social interactions amongst the actors involved, their responses to and interactions with the innovation, and the organizational context in which they are situated (Robert et al., 2009).

As such, previous research on IS (Bunduchi, 2004) underlined the importance of deciding on the research paradigm to follow early on, as any study has to reflect the identified research strategy and questions. As the aim of my research was to understand the expected and actual outcomes of HRIS projects in different contexts, as well as to examine the associated processes of HRIS development and implementation, I adopted a non-positivistic, qualitative research paradigm.

Among the diverse types of qualitative research available (e.g. ethnography or phenomenology), I chose to adopt a qualitative case study approach because it is “an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident....[and it]...relies on multiple sources of evidence” (Yin, 2003, p.). It also allows access to rich and detailed contextualized data and has been used successfully to study other top-down technology implementation projects in complex healthcare contexts (Cucciniello, Lapsley, Nasi & Pagliari, 2015; Scott, Ruef, Mendel & Caronna, 2000).

This study focused on international analysis of two HRIS projects in rather different European countries. The case study in the first European country (Country 1) focused on a national-wide project, while the case study in the second

European country (Country 2) involved a region-wide project of development and implementation of the same HRIS system.

Previous research has stated that studies using multiple cases can “predict similar results (literal replication) or produce contrasting results for predictable reasons (theoretical replication)” (Yin, 2003, p.47). In this way it can “strengthen research findings in the way that multiple experiments strengthen research findings” (Darke, Shanks, & Broadbent, 1998, p.6). Thus, although each of these two case studies was conducted independently, the smaller-scale region-wide HRIS development and implementation project in Country 2 was studied in order to assess the replicability of the methodological and theoretical approach chosen in the case study of Country 1. Here the data collected from the second case study in Country 2 was critical in enhancing the theoretical framework and research strategy.

As the nation-wide program of HRIS development and implementation in Country 1 was very big and complex I adopted an embedded case study approach, where I first studied the program at the national level (the wider unit of analysis) by focusing on the national project team, and then examined eight individual Regional Health Organizations (RHO) in depth as embedded cases (sub-units). This approach was chosen to allow comparison across the eight embedded units of analysis and to provide opportunities to examine both shared and context-specific themes (cf. Yin, 2009).

5.4 Selection of cases

5.4.1 Selection of country

The idea of conducting multiple case studies in two selected European countries was triggered by the outcomes of previous research on technology initiatives in healthcare contexts, which compared implementation of Electronic Medical Record in the same European countries (e.g. Cucciniello, 2011). Moreover, these two countries were found suitable for this case study, as they are both part of the European Union (EU), have national health systems, and historically the health system in Country 2 was modelled after the health system in Country 1 (Cucciniello, 2011).

Finally, Country 1 was selected because it had a national health service that was suitable for my research, and was in the process of implementing a nation-wide HRIS system. Thus, I arranged for a six months' research visit to the University of Edinburgh in order to study this project. Country 2 was selected because it is the country of my residence and the country where I was pursuing my PhD.

5.4.2 Selection of sector

The title of my PhD program is "Innovation and Management of Public Resources". The main aim of this program is to improve the quality of services offered by public sector organizations, as well as their efficiency and productivity. Therefore, it was important that my PhD research focused on organization/s from the public sector. As my research interest has been always in HRIS and their impacts, readings of relevant interdisciplinary literature suggested that very little is known about the development, implementation, use or impacts of HRIS in

health organizations. Nevertheless, these are essential enabling technologies for the business of healthcare, and underpin much of the drive towards health care quality and efficiency across the world (Thouin & Bardhan, 2009). This has been underlined by academic scholars (Riley et al., 2012), by practitioners and by policy makers (WHO, 2006). Moreover, the health sector is very complex, including types of complexity related to a variety of different kinds of professionals working, competing and collaborating, and hence provides a rich context for examining the development and implementation of HRIS. Thus, I decided to address this serious literature gap and chose to conduct my research in the public health sector, hopeful that the findings of this research would be generalizable for other public sector organizations.

5.4.3 Selection of units of analysis

In the national case study in Country 1, following Yin's (2003) embedded case study approach, National Health Organization (NHO) is the largest unit of analysis, and selected RHOs are its sub-units (see Table 8 for a description of the selected RHOs). Here I first studied the program at the national level (the wider unit of analysis) by focusing on the national project team, and then examined eight of its RHOs in depth as embedded cases, selected to represent a range of geographies, characteristics (e.g. size, composition of staff or HRIS systems employed) and implementation phases, based on an analysis of project documentation and on conversations with the program lead. Comparison across these eight embedded units of analysis (the eight RHOs which were selected for in-depth study) provides an opportunity to examine shared and context-specific

themes (cf. Yin, 2009). Detailed description of the selected RHOs is presented in Table 8.

As I aimed to assess the replicability of my methodological and theoretical approach, with a view to informing a framework for future studies in this area, it was important to find an HRIS project in Country 2 that involved the same IS system as developed and implemented in Country 1. Thus, I searched the Google search engine in order to find a suitable smaller scale regional HRIS development and implementation project in Country 2.

5.5 Data collection

A “Multiple method” strategy was followed for data collection as this allows an understanding of all angles of research questions and helps to render the research more generally valid (Read & Marsh, 2002, p. 237). It also offers “A deeper understanding of complex social phenomena and produces much more accounts of social reality” (Bryman, 1988, p. 126). Moreover, it has also been successfully used in previous qualitative research (e.g. Easterby-Smith et al., 1991), as well as previous research on ICT in health (e.g. Cucciniello, 2011)

Thus, two main methods of data collection were employed in this research: semi structured interviews with key stakeholders involved in the development, or implementation of HRIS; and extensive documentation including both internal and publicly available historical information about the studied HRIS projects.

5.5.1.1 Documentation

Previous research mentioned the importance of documentation and its analysis for obtaining generic or historic information about organizations (e.g. Appleton & Cowley, 1997). Documents and their analysis were also found to be valuable because they do not require too great an investment of time from study participants, and compared, for example, to qualitative interviews are less likely to be misinterpreted (Appleton, & Cowley, 1997). Documentary analysis was used in this research as a comparator to the data collected via interviews in order to increase the validity and robustness of the study findings.

Documents analyzed included relevant internal and publically available documentation relating to the project’s comprehension, adoption or implementation or covering the duration of the project. Internal documents related to HRIS comprehension, adoption and implementation were provided by key contacts in the organizations studied, as well as other interviewees. Publicly available relevant documentation including, for example, national ICT strategies were searched via Google search engine. The detailed lists of documents analyzed for each case study are presented in Table 7.

Table 7. List of documentation collected and analyzed

National case study in the Country 1	Regional case study in the Country 1
Secondary	
[Country] eHealth strategy	RHO website
NHO website	(Relevant) News
Project website	Presentations about the project
[Country] Shared Support Services Project description	
(Relevant) News	

Primary	
Workforce Information Systems Strategy. Strategy Report	RHO's HR Development Program
[HRIS] eHealth Outline Business Case	System supplier presentation
[HRIS] eHealth Project. Standard Business Case	Analysis of "As is" and "To be" HR processes
[Country] Workforce Information Strategic System. Short Term Solution-Phase 1&2 Implementation Proposal	Local implementation plan and timeline
[HRIS] Services specification	
Project Gantt chart	
Procurement documentation (e.g. invitation to tender documentation, pre-qualification questionnaire)	
End of [HRIS] Pilot National Implementation Board Report	
Pilot Project. iRecruitment Review Report	
Pilot Project. Using [HRIS] – Lessons Learned Report	
Selected RHOs [HRIS] local implementation plans	
System training materials (e.g. [HRIS] Self Service Awareness Session, Employee Quick Reference Guide)	

5.5.1.2 Interviews: Structure and process

Taking into consideration the nature of the research questions, as well as the sensitivity and in some instances confidentiality of the issues discussed, semi-structured interviews were adopted as the main data collection method. This allowed not only to the building of trust with interviewees (which, for example, helped them to answer openly), but also enabled flexibility. Thus, although semi-structured interviews set out the main themes for discussion, they also gave respondents an opportunity to speak about any issues they felt were relevant for

my research. Finally, semi-structured interviews were chosen also because they respond to the need for the qualitative research to understand the meanings of people's experiences, as well as enable the interaction between interviewer and her respondents (Ritchie & Lewis, 2003).

The data were collected between summer 2015 and winter 2016. 31 semi-structured interviews with 25 key stakeholders involved in HRIS development and implementation were conducted for the case study in Country 1, and seven interviews with eight key stakeholders were conducted for the case study in Country 2 (see Table 8).

Table 8. Interview respondents

National case study		Regional case study	
<i>Interview Respondents</i>	<i>N</i>	<i>Interview Respondents</i>	<i>N</i>
National project team respondents	3	Administrative IS team respondents	3
eHealth respondent	1	HR professionals	2
Senior procurement respondent	1	Care processes governance team respondent	1
Vendor key project participants	2	External consultant	1
System supplier key project participant	1	System supplier key project participant	1
Senior HR executives	7		
Project manager	1		
HR professional	9		
HRIS team members	4		
Manager user	1		
Employee user	1		
Total	31	Total	8

Interviews were conducted mostly face-to-face; however, phone interviews were also used when this was preferred by interviewees or when respondents were geographically very distant from the location of the interviewer.

Interviewees in Country 1 were sent a Study Information Sheet (see Appendix 2) that informed them about the purpose of this research, addressed data confidentiality and anonymity issues, and answered some potential questions about future uses of the data (e.g. publishing research results). Interviewees in Country 2 were informed of the aforementioned points face-to-face prior to the actual interview.

The semi-structured interview guide I designed (see Appendix 3), was reviewed by and tested on my host co-supervisors at the University of Edinburgh (Dr. Raluca Bunduchi and Dr. Claudia Pagliari). It was also sent to the main contact in the health organization in Country 1 with a request to review it and advise if any of the questions were unclear. This interview guide did not require much refinement during the data collection process. However, the questions asked were adjusted based on the ICT innovation stage (e.g. comprehension, adoption or implementation) that each interviewee was involved in. Thus, for example, respondents from the national project team in Country 1 were asked all the questions listed in the interview guide, while some HR Professionals from the selected RHOs (e.g. those who got involved only during local implementation activities) were not asked any questions regarding the “Intention to Adopt” innovation stage (e.g. what organizational factors and people influenced the decision to purchase and implement HRIS).

Most of the respondents were interviewed individually, although several group interviews were also conducted, for example, when respondents invited their colleagues to attend them. I interviewed most of respondents myself. However, Dr. Raluca Bunduchi, my host co-supervisor at the University of Edinburgh,

attended several initial interviews, and one group interview to ensure that I felt comfortable and confident interviewing senior respondents. This was done following observations of previous qualitative studies (e.g. Payne, 2000), which noted both that interviewing in qualitative research is a complex assignment, and that it can nonetheless be learnt.

Respondents were selected based on their knowledge of and involvement in the HRIS projects in question. Potential bias in selecting respondents was addressed by the diversified sampling strategy. Interviewees were either recommended by the key contacts in the studied organizations, snowball sampled (e.g. interviewees were asked to recommend other project stakeholders who could contribute to the study) or volunteered to participate in my research.

Interviews lasted 50 minutes on average (range 22-100 min) and were recorded, transcribed verbatim, anonymized and sent to respondents for verification and clarification where necessary.

5.6 Data analysis

Data analysis was mainly informed by the qualitative approach described by Miles and Huberman (1994), and involved the following three main activities:

- Data reduction or data coding where data was organized and grouped into common themes;
- Data display where analyzed data was organized in a format that would help understanding of the studied phenomenon; and
- Verifying data and drawing conclusions on relationships, patterns and explanations for them.

Thus, data analysis in my research started with data coding, where an “open” coding approach (Glaser & Strauss, 1967) to data analysis was first adopted in order to elicit preliminary categories and themes, reflecting as faithfully as possible the terminology of the respondents. To optimize inter-consistency, one of the richest transcripts was first open coded independently by two researchers (Dr. Raluca Bunduchi, and myself), who iteratively reviewed their emergent codes. Analysis then moved to the interpretation stage, searching for patterns and relationships and developing the coding framework. Interpretation involved a highly iterative process of going back and forth from the data to the literature to explore concepts, seek interpretations and identify patterns that could illuminate the actor’s behavior and the characteristics of the IS innovation process.

At this stage building on previous research, data related to HRIS expected benefits and outcomes were coded either according to (1) HRIS benefits identified in previous research (see Table 5) or (2) additional expected and realized benefit categories for HRIS in health that I identified in my systematic literature review (see Table 5). Data that did not fit into any of these categories was then grouped separately. Finally, data related to factors that prevented benefits from being achieved were also classified according to categories from previous research, which were summarized in the findings of the systematic literature review on HRIS in health (Environmental, Inter-Organizational, Organizational, Individual, and Task, Technology- or Project-related).

This coding approach helped to classify the data on the Expected HRIS Benefits, Outcomes and Factors of Influence according to the categories from generic and Health HRIS research, and to identify additional categories of benefits that

emerged from the data. However, as during this analysis I discovered that not all of the envisioned expected benefits were achieved, I also set out to examine the HRIS development and implementation process that led to these outcomes.

Thus, during the interpretation stage of data analysis the concept of institutional forces, in particular coercive pressure from government, seemed to provide a powerful explanation for changes in the innovation process during its early stages. This prompted me to explore institutional theory as a means of enriching the interpretive framework for my observations. Further investigation of data revealed other institutional concepts as powerful lens to examine the data, in particular organizing visions (to explain changes in the process of the innovation at each stage) and strategic responses (to explain the innovation outcomes). Thus, I revisited and re-coded the data with reference to the institutional pressures (coercive, normative managerial, normative technical, and mimetic), organizing visions (business problematic, core technology and organizational processes) and strategic responses (acquiescence, compromise, avoidance, defiance and manipulation) characterizing the innovation stages of comprehension, adoption and implementation that also emerged from the analyzed data.

Although both of the aforementioned coding frameworks (on expected and realized benefits, and on institutional pressures, organizing vision and strategic responses) structured the data, the initial open data coding ensured that no important emerging theme was missed or neglected.

All stages of data coding made use of the Nvivo qualitative analysis software package.

5.7 Ethical considerations: Confidentiality and sensitivity

Part of my research was conducted during my six months' research visit to the University of Edinburgh, where I was co-supervised by two Senior Lecturers. Thus, University of Edinburgh Board of Ethics approval was sought (see Appendix 4) and obtained ("Level 2 Ethics approval: non-intervention research where you have the consent of the participants and data subjects" (University of Edinburgh, 2016)) for conducting this study. Overall, the necessity of obtaining ethical approval prompted me to consider very seriously various issues (e.g. anonymity and confidentiality), which was reflected in the creation of the research strategy (e.g. to anonymization of study participants).

Before conducting the case study in Country 1, I also contacted the Research Ethics Office of the studied NHO, and inquired regarding the necessity to obtain their ethical approval for my research. However, I was advised that it was not essential, as my data collection strategy did not involve interviewing patients. I was also not asked to obtain any ethical approval from the University of Molise or the studied RHO in Country 2. However, I still followed the same ethical guidelines as in the Country 1 in order to ensure consistency (anonymity and confidentiality for the respondents) across both cases).

Relationships of trust were established with the study participants, and sometimes they shared sensitive and confidential information regarding the projects studied. Thus, to maintain their confidentiality, the names of participants and organizations studied were anonymized and any identifying information was removed in this thesis and any relevant publications. I have also always stored both soft and hard copies of recorded interviews and documentation received in a secure place.

Overall, if I had any concerns about ethical issues, I always addressed them with my University of Edinburgh co-supervisors or checked the University of Edinburgh website for further guidance.

5.8 Critical reflections on my role as a researcher

My educational background is in engineering and IS, and my professional background is in HRM. I often mentioned these educational and professional experiences to interviewees. This increased my credibility as a researcher and enabled them to use IS and HR terminology freely, as I was familiar with it. In the initial interviews, I also told them that I used to work in an international, private bank. However, I observed that the study participants did not consider this an asset in my research, and so I did not mention it in later interviews, unless I was specifically asked about my previous work experience.

I also had experience of conducting research in the health sector (an enterprise project for my Master's degree at McMaster University, Canada). However, my knowledge of the studied health contexts was initially very limited. Thus, I always had to prepare for the initial interviews (e.g. read about how health systems in the studied countries work) and ask my supervisors and occasionally even study respondents for clarifications, which in some cases increased the duration of the conducted interviews.

While gathering and analyzing the data for my PhD research, I tried to be open minded and aware of any assumptions, stereotypes and biases that were shaped by my background and especially working experience in the private sector, although I recognize that these together with the influence of the research background of

my PhD Supervisor at the University of Molise and host co-supervisors at the University of Edinburgh most likely affected my research strategy (Mauthner & Doucet, 2003).

Finally, I believe that the most important lesson that I learned during my PhD is not to make any assumptions while analyzing data, as I tended to do initially, but to examine it with a very critical eye. This helped me to avoid jumping to conclusions, and to do my best in ensuring that my data analysis is reliable, as also discussed in the next section.

5.9 Quality of the study

Qualitative research has to meet several criteria to reassure readers that its conclusions can be trusted. There are several approaches to assessing the quality of qualitative research (e.g. Yin, 2003). I adopted the following approach that had already been used successfully in previous qualitative research on HRIS in health (Stringer, 1999, p. 176; as cited in Waring, 2000):

- *“Credibility* – established by prolonged engagement with participants; multiple sources of data for triangulation purposes; participants check and verify the accuracy of data and information recorded; peer debriefing which allows the researcher to reflect on research processes with a colleague.
- *Transferability* - established by describing the means for applying the research findings to other contexts. This is done by giving detailed descriptions that enable the readers to identify similarities between the research settings and other contexts.

- *Dependability and confirmability* - readers should be able to see an audit trail that clearly describes the processes of data collection and analysis.”

Moreover, while writing this thesis, I also followed the CASP qualitative research checklist (that I also used to assess the quality of the qualifying studies in my systematic literature review) to ensure that no important research quality-related points were missed.

5.9.1 Credibility

The transcribed interviews were sent to appropriate respondents for review. Some confirmed that the transcripts provided an accurate representation of the conducted interviews, while others added to their transcripts missing information or essential clarifications. "Multiple data sources (e.g. semi-structured interviews and public or internal documentation) were analyzed in my case studies to increase their reliability, although potentially observations on the behaviour of study participants could have added additional credibility and ensured full triangulation."

I established and maintained good collaborative relationships with key contacts in the health organizations studied in both countries, and they confirmed that my observations and conclusions were accurate for the time when the data was collected (e.g. when I shared with them conference papers concerning their case). Moreover, the research strategy, as well as the preliminary research findings were constantly shared and discussed with my PhD supervisor as well as with hosting co-supervisors at the University of Edinburgh to identify any emerging issues, and to address them in a timely manner. Finally, preliminary research results were

discussed at various interdisciplinary (e.g. health informatics, organizational studies or HR) workshops (e.g. Strategic HRM workshop) and conferences (e.g. European Group for Organizational Studies or Farr Institute Health Informatics Conference) in order to obtain feedback on the research methodology and theoretical concepts adopted. The full list of conferences, symposiums and workshops where research results were presented and discussed is presented in Appendix 5.

5.9.1.1 Transferability

Qualitative research has been often criticized for not offering the same generalizability of findings as quantitative studies (Mason, 2002). There are some recommendations on how to address this limitation by sampling “typical organizations/cases” (e.g. Flyvbjerg, 2006; Cresswell, 2011). In my research this constraint was principally addressed by employing a “multiple case study” approach (Stake, 1995), where the case study in Country 2 was conducted in order to identify whether the case study results regarding Country 1 were replicable and thus potentially generalizable to other health or public sector organizations.

5.9.1.2 Dependability and confirmability

Previous research has underlined that “convincing the reader of the validity of case study research is as much a matter of rhetorical style and flair as it is of accuracy and care in matters of theory and method” (Walsham, 1995, p.79; as cited in Darke et al., 1998, p.288), and that publications on case studies “must be

composed in an engaging manner...that constantly entices the reader to continue reading” (Yin, 2009).

In this study, I have done my best to describe my research strategy in detail, support my arguments with sufficient evidence and present my research findings in tabular format, as was recommended for qualitative case studies by Darke and colleagues (1998). Finally, I have also tried to present my case study “as an interesting and convincing story” (Darke et al., 1998, p. 287).

5.9.1.3 CASP Checklist

CASP checklist was used to assess the quality of qualifying studies in my systematic literature review on HRIS in health. It was selected as it is commonly used to assess the quality of qualitative research (e.g. Dyba & Dingsoyr, 2008; Sheikh et al., 2013). However, I also adopted it as an essential point of reference to build this thesis. Thus, I used it in order to ensure that all critical methodology and quality-related points have been thoroughly addressed, but not to assess the overall quality of this dissertation.

5.10 Conclusions

This chapter has outlined the research questions set out for empirical study and has justified the chosen research design. It has also described and aimed to validate methodological choices made throughout this study (e.g. selection of cases to study or approaches to data collection/analysis). Furthermore, it has provided critical reflections on ethical issues, my role as a researcher and the quality of this research.

In summary, qualitative multi-case study design was adopted, where the case study in Country 1 is focused on nation-wide, and the case study in Country 2 on region-wide programme of HRIS development and implementation. The reason for conducting case study 2 was to examine whether the findings from the case study 1 would be replicable, and thus potentially transferable/generalizable to other health or public sector organizations. Semi-structured interviews were chosen as the primary data source, but they were complemented with documentary analysis to increase the validity of this study. Data analysis was mainly informed by the qualitative approach described by Miles and Huberman (1994). The results of this data analysis will be presented in the following chapters together with rich descriptions of each of the studied cases.

6. Chapter 6

A COMPARISON OF EXPECTED VERSUS REALIZED BENEFITS IN HRIS PROJECTS IN DIFFERENT CONTEXTS

6.1 Introduction

The results of my systematic literature review on HRIS in health (Chapter 3) revealed that only a few studies have reported whether HRIS initiatives have achieved their expected benefits, and noted seven factors that can influence and shape HRIS initiatives in health. Moreover, it found that no study compared HRIS projects across countries. Influenced by the outcomes of this review, as well as by the recommendations of previous generic research on HRIS (Parry & Tyson, 2011), which highlighted a lack of theoretically sound and rigorous empirical studies comparing envisaged versus realized benefits of HRIS, I therefore set out to explore the expected and actual outcomes of two HRIS projects in two different EU countries, as well as to empirically examine whether the factors identified in my systematic review influenced this project⁶.

⁶ The case study presented in this chapter was conducted in collaboration with Dr. Claudia Pagliari and Dr. Raluca Bunduchi as a part of my research visit to the University of Edinburgh and has been discussed at the:

- 31st Workshop on Strategic Human Resource Management organized by the European Institute for Advanced Studies in Management in Spain in April 2016. Paper name: What does it take to implement an HRIS at Scale? Analysis of the Expected Benefits and Actual Outcomes.

This chapter reports on the results that have emerged from this analysis, while Chapter 7 presents results of the additional study that focused on the processes that characterised HRIS development and implementation in the HRIS projects studied. Detailed description of the theoretical frameworks used in this study are presented in Chapter 4, while research strategy and methodology are described in Chapter 5.

6.2 National case study in Country 1

6.2.1 National case study setting: NHO and its HRIS strategy

The NHO studied is a publicly funded health system in a small European country. It consists of about 20 geographically dispersed RHOs with more than 150,000 employees. These RHOs are all separate legal entities with their own HR departments and consist of major urban hospitals, smaller regional hospitals and groups of health units acting as parts of a wider organizational enterprise.

Devolution has occurred in the studied country and its Parliament became accountable for NHO and demanded rich data on NHO's workforce to monitor and evaluate its performance. However, there were numerous other factors (described in detail below) that drove the need for a nation-wide HRIS, and thus prompted creation of NHO's country level HRIS strategy over a decade ago.

The initial strategy consisted of the following three main stages:

-
- 6th International e-HRM Conference organized in University of Twente in Netherlands in October 2016. Paper name: Do we expect too much from new technologies? A comparison of Expected versus Realized Benefits for a national Human Resource Information System (HRIS).

- Short term solution (1 year) – immediate provision of required workforce data from pre-existent national Payroll system;
- Medium term solution (2-3 years) – building the basis for the long term solution such as creating the required architecture and standards for the national HRIS data set;
- Long term solution (4-5 years) – full achievement of the NHO’s HRIS vision, which comprised adoption and consistent use of the national HRIS (yet to be chosen) by all RHOs.

The final decision included combination of the short and medium term solutions. Thus NHO proceeded with developing and implementing the first country-wide HRIS (including agreement on common HR terminology and HRIS dataset), to be used for statutory reporting across all individual RHOs, and interfaced with the pre-existent national IS for Payroll. The first phase of this project (short + medium term solution) finished in 2008, when responding to diverse pressures (as described below) the studied NHO started putting together the business and technical specification for the national HRIS system (long term solution).

6.2.2 The HRIS project

The HRIS implementation project under study is currently underway across all individual RHOs within the NHO.

A complex supplier market review was undertaken in order to choose the HRIS. According to the eHealth Outline Business Case it involved the following main activities (citation is not provided to maintain the anonymity of the studied NHO):

- *Supplier Demonstration:* Supplier of HRIS in NHO in a neighbouring country was asked to demonstrate their solution;
- *Functional Requirements Review:* Payroll and HR specifications were forwarded to the supplier of HRIS in NHO in a neighbouring country to ascertain whether their HRIS could meet the requirements of the studied NHO;
- *HR Procurements Review:* A brief review of recent RHO HRIS procurements was undertaken;
- *Value for Money Review:* An independent consulting company was asked to conduct value for money evaluation of the solution proposed by the HRIS supplier in NHO in a neighbouring country, as well as to provide an approximate cost for implementing the new HRIS and interfacing it with the pre-existent national Payroll system;
- *Payroll Efficiency Review:* NHO's payroll team efficiency was evaluated and the results were compared to those of payroll teams in NHOs in the neighbouring countries (e.g. number of employees processed per payroll team member) in order to explore the potential impact of the new HRIS implementation;
- *Site Visit:* The National Project Team in the studied NHO visited NHO in a neighbouring country to study their recent experience of HRIS development and implementation.

Based on the aforementioned evaluations NHO thoroughly considered various business case scenarios including:

1. *Do minimum* that included leaving individual RHOs to choose their HRIS, so long as these HRIS could be interfaced with other national workforce systems (e.g. Payroll).
2. *Roll out HR component of the system implemented in NHO in a neighbouring country* across all RHOs and link it with the pre-existent Payroll system.
3. *Roll out full HR + Payroll system implemented in NHO in a neighbouring country* across all RHOs. This was assumed to involve system configuration and customization to make it work in the studied NHO.
4. *Procure other HR-only solution* that would replace all HRIS across individual RHOs and be integrated with the pre-existent national Payroll system.

The final decision included proceeding with the Option 4. It was chosen mainly because the primary requirement of NHO was to have an HR-led IS (as opposed to a Payroll-led IS), and because the HRIS used in NHO in a neighbouring country was found to have limited functionality.

The HRIS system in question was procured via the EU tender process. It includes HR, Employee Relations, Self-service HR, iRecruitment, Learning Management and HR analytics modules. The subsequent implementation activities divided NHO across five phases of implementation, and the project was initially scheduled to take place between 2011 and 2014 (see Figure 8), although it was still in progress when the data for this study was collected.

Figure 8. Project timeline

Planned	HRIS Specification	Business Case & Procurement	HRIS Testing, Training & Phase 1	Phase 2&3	Phase 4&5				
COMPREHENSION	ADOPTION			IMPLEMENTATION			ASSIMILATION*		
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Actual	HRIS Specification	Business Case & Procurement	HRIS Testing, Training & Phase 1		Phase 2	Phase 3&4	Phase 5 & Pilot	Remaining RHOs	
*Not in the scope of this study									

6.2.3 Expected and realized benefits from HRIS and recipients of

HRIS benefits

Initially this study aimed to identify expected benefits and actual project outcomes. However, during the data collection process, I realized that, due to diverse challenges, the project had faced some delays, and that only small pilot groups/departments implemented and were using the system. Therefore, the focus of this study shifted to the expected versus realized pilot (post-implementation) benefits.

The results of the analysis of this project suggest that it was driven by various expected benefits at different levels. Expected and realized benefits from HRIS (RQ1) according to the various HRIS project stakeholders/user groups (RQ2) are described below.

Although it was initially scheduled to be completed in 2014, the studied HRIS project was still in progress at the time of data collection, and analysis of the data suggests that its development and implementation processes have been challenging for all of the stakeholders. Therefore, not all of the initially envisioned expected benefits had been attained immediately after implementation,

when the data were collected, while the project has had some unexpected consequences.

6.2.3.1 Operational Goal and Efficiency

Expected

Government expectations for quality improvement in the health service are constantly increasing while the budgets available for public services in Europe are decreasing. Therefore, it was/is especially important for the *Government* to ensure that all resources, and especially those related to workforce – which can account for between 65-80% of total operating budgets of health organizations (Khatri, 2006) – are properly planned and spent. Thus, the key driver that prompted the implementation of this countrywide HRIS, which was also incorporated into numerous *Government* strategic documents, was the need for the *Government* to be able to quickly obtain, and consequently for *NHO* and *RHO* to quickly provide, workforce data to enable the creation and implementation of effective workforce and health policies.

“There was a kind of belief that it’s the best thing for [NHO] to have this kind of information, a single business system, it’s huge it really is, a huge lot of data and a huge information and very, very helpful for everybody from management and HR corporately up to [RHOs] and up to the [Government]”. (National Project Team respondent 2)

The *HR professionals* interviewed - even those with advanced pre-existent HRIS - reported that they were looking forward to having a new HRIS, as it was promised to them that the new single instance HRIS would be integrated into other national

(e.g. Payroll) and regional (e.g. rostering) systems. This was supposed to eliminate the need for multiple data entry across various systems, to streamline associated processes, reduce bureaucracy and enable preparation of efficient and consistent statutory workforce reports.

“I think it was going to be quicker. The system was meant to take away a lot of the paperwork side from us...Also we were told that it would generate the letters so a lot of the admin side would be taken away because it would generate the letters we would just have to print it off and send”. (HR Professional, RHO 7)

Moreover, the national HRIS system was supposed to allow data sharing between all country RHOs, which would in principle ease inter-organizational transfers for health professionals and reduce the work associated with it for *HR professionals* (e.g. it would be possible to transfer an employee record instead of creating a new one).

“The primary goal was to try and do things once across [the Country] and have a single system that would allow us to move off where we moved people around... The [RHOs] are individual employers. But every time somebody re-joined the [RHO] we start again, so we might get some payroll information from a previous [RHO], that’s it; we then set up new files, new sense data, etc., in that individual. So the goal was, as we have a [NHO], then we would be able to transfer data across”. (Senior HR Executive, RHO 3)

Finally, *HR Professionals* also remarked that the studied HRIS project has never aimed to reduce staffing within RHOs or to achieve financial savings.

“The idea of the system was not brought in to drive forward financial savings”. (Senior HR Executive, RHO 2)

The expected benefit for *Managers* and *Employees*, as reported by the eHealth respondent and some HR Professionals, was to automate some of the pre-existent paper HR processes, which as a result would make these processes easier, save Managers and Employees time and reduce the paper used.

“Any approvals and things like that will be done on-line so, you know, it reduces paper, reduces a lot of that, but equally it reduces the labour process”. (eHealth respondent)

It should be noted that although *HRIS Team Members* also reported reduced paper work as an expected benefit, however, they highlighted that eliminating paper processes would require transferring all the data into the new HRIS first.

“It’s going to take away a lot of paperwork, a lot of the risk in losing that paperwork, that trail’s is going to be stored within the system”. (HRIS Team Member)

Realized

Some *HR Professionals* reported that the new system has been set up to require less approvals (e.g. two instead of three or four) compared to their pre-existent paper based processes. Thus, it was perceived that the new HRIS simplified and speeded up some processes, while also reducing bureaucracy.

“I think it’s a lot quicker, even with putting things on to be advertised, especially, like I think that part is much quicker, it’s just one thing just what I need to do rather than back and forward”. (HR Professionals, RHO 7)

However, *HR Professionals* also suggested that the HRIS implementation project caused more work for them. This was mainly associated with the data migration or data catching up processes that *“...led [them] to manual entry of data once the*

initial uploads were done which [they] hadn't done in the past". (Senior HR Executive, RHO 3)

The interviewed *Manager* was very positive about realized pilot benefits, which she summarized as an automated and quicker recruitment process, as well as the empowerment that she felt by being able to access and monitor her teams' employment data without relying on HR.

"In the old system I only had the date that the member of staff was hired for this organization, but you could never see when they moved to this particular role and I had to go to HR, they had to go to their manual copies, they had to find the date and send it to me. Now, you go into the system and you can see all of the dates. Every single date of when a person had changed". (Manager User, RHO 7)

However, she also reported that HR in her RHO had established additional levels of controls in the system to ensure that managers make accurate records (e.g. accurate feedback notes that are sent to interviewed candidates), which caused some unexpected delays in the recruitment processes.

The interviewed *Employee* did not report any achieved pilot benefits, although some HR professionals claimed that users liked that they could add/change their personal details in the system, which enabled marginal time and paper savings.

"To a small extent in some of the departments that are using it for annual leave recording are not filling out annual leave request bits of paper and exchanging those and filing those and that sort of nonsense. So there's probably a marginal paper saving and time saving in that, but then you need to extend that into all your other business process as well to get the full benefit". (Senior HR Executive, RHO 6)

None of the respondents reported any operational efficiency-related realized benefits for the *Government*, *NHO* or *RHO* at the time the interviews were conducted.

6.2.3.2 Service Delivery

Expected

For *HR Professionals* the new system was supposed to expand pre-existent services they provided for their internal customers such as *Managers* and *Employees* (e.g. creating notification about new job opportunities), which as a result was supposed to also have a positive impact on their work (e.g. to increase candidate's pool for recruitment and thus to enable quicker filling of vacant positions).

“One of the wonderful things I think about the recruitment side of things... if people have registered and said ‘I’m interested in midwifery jobs’ you can send them all e-mails saying ‘here’s a job come up’ and suddenly you’ve got this huge number of people that you could never get hold of before. You could put an advert in the paper or you could put things on Internet sites but if they don’t go and look at it, now you can actually send stuff out”. (National Project Team Respondent 2)

Interviewed respondents did not report any expected Service Delivery related benefits for the *Government*, *NHO* or *RHOs*.

Realized

Some *HR Professionals* reported that the new HRIS contains better quality information, and that they and *Managers* in their *RHOs* are benefitting from the

reports they can generate from it. This was also confirmed by the interviewed *Line Manager*.

“Definitely more quality information that’s coming out of it”. (HR Professional, RHO 7)

However, according to some *HR Executives*, an increase in the amount of work associated with the new HRIS implementation affected the level of service that HR departments provided to their internal customers, as staff responsible for day-to-day HR practices such as recruitment, were pulled from these activities in order to help with the local RHO’s system implementation activities.

No service delivery benefits were reported for the *Government, NHO, RHO* or *Employees* at the time the interviews were conducted.

6.2.3.3 Standardization

Expected

NHO already had a standard electronic system to support its payroll administration activities on a national level, however, there was no consistency across the HR processes and HRIS systems used within the individual RHOs, and consequently across the workforce reports they provided to the Government.

“Some people had quite sophisticated systems, but it meant if you were the [Government’s] health department and you’re asking for reports, then you would have got the reports in different ways”. (Senior HR Executive, RHO 2)

Thus, in 2007 an internal *NHO* survey revealed a wide variety of computer, access/spreadsheet and paper-based systems to support HR activities across the country; only 60% of 42 surveyed RHOs had HR systems, and these systems were

provided by nine different companies. Therefore, the *NHO*'s vision was to have one standardized, national HRIS that would replace the diverse IS used across the *RHOs*, and consequently would allow preparation and submission of workforce reports in a uniform format.

“Having one system that’s maintained that information. That’s one of the key benefits for the [NHO] as a whole, I would say”. (HR Professional, *RHO* 7)

There was also a long-term vision that by implementing nationwide HRIS, some of the most critical HR processes, such as recruitment, could be standardized. Overall, the medical recruitment process has been identified by the Government as a critical priority to meet the demand for high quality health care delivery across the whole of *NHO*. Consequently, the expectations of *HR Professionals* for the recruitment module of the new system were also elevated.

“So I think the recruitment process is quite complex but we also have challenges within recruiting clinicians and folk all around [the country], so it was really bringing in a standardised way of doing that”. (eHealth Respondent)

No expected standardization related benefits were reported for the *RHOs*, *managers* and *employees*.

Realized

HR Professionals mentioned that the new HRIS assisted in standardization of the *NHO*'s pre-existent HR processes such as posting *RHOs*' job announcements in a unified format. Moreover, the process of implementation of the new HRIS opened up a dialogue between *RHOs* about reconsidering their operating procedures, and triggered an opportunity to move towards standardizing *NHO*'s HR practices across all *RHOs*.

“It’s a way of working we’re trying to do across [NHO], which is just sharing services and doing things differently. So we’ve got, [many RHOs] all doing recruitment at the moment, but we actually think, well, maybe three or four bigger [RHOs] should just do the recruitment on behalf of all the [RHOs] or something, rather than us doing it. Because it must be more cost effective that way, but... We’re still at early doors with that discussion, but it’s certainly being looked at. And having a national HR system would help us with all of that discussion, because everybody would be able to access all the different bits of information, etc. So it’s quite critical to all of that”. (Senior HR Executive, RHO 8)

No standardization related benefits were reported for the *Government, NHO, RHOs* or *Employees* at the time the interviews were conducted.

6.2.3.4 Strategic benefits

Expected

Government envisioned that in the longer term, once varying HR processes across RHOs had been standardized, some of these HR processes potentially could also be centralized, and shared between individual RHOs. For example, selected RHOs could become responsible for different HR processes (e.g. recruitment) and perform them for all RHOs in the country.

“The overall directives come from the [Government] and they’re looking to have shared services within HR, so we all need to be working off the one system and working in the same way”. (Implementation Team Member, RHO 8)

For *NHO* and *RHO* access to up-to-date and accurate workforce data was expected to allow better workforce planning, which as a result could help *RHOs*

and *NHO* to achieve their strategic organizational objectives such as improved patient care or an increased level of patient safety which was reported to be challenged by high levels of absence among medical professionals or turnover across the country.

“So there’s some key drivers around how it ties in with patient safety, how it ties in with workforce planning”. (Senior HR Professional, RHO 2)

For *HR Professionals* the new HRIS promised automation of simple administrative tasks such as posting announcements about vacant positions to the Internet, which was envisioned as a great strategic benefit that would allow *HR Professionals* to catch up on their work, and more importantly focus on more complex HRM practices such as performance management.

“It would enable the HR department to concentrate on other work that they should be doing”. (HR Professionals, RHO 5)

This functionality was especially wanted by the RHOs without pre-existent HRIS, which were looking to replace and/or automate existing paper or spreadsheet-based processes with the help of the new HRIS.

No expected strategic benefits were reported for *Managers* and *Employees*.

Realized

No realized strategic benefits were reported for any stakeholder at the time the interviews were conducted.

6.2.3.5 Empowerment

Expected

The interviewed *Line Manager* reported that the expected benefit for her and her team was to have a single instance HRIS that would record and maintain all staff information, so that they could focus on their primary job responsibilities instead of spending time on administrative tasks such as inputting their information into various IS.

“Why now you have to push [employees] and tell them ‘go into the other system and please log your training courses and put everything that you have done’ and when you are very busy throughout the day you might not find that is absolutely important and you find that most of them don't do it, which is a bit -, so you don't have a full [Personal Development Plans]. So I'm hoping that because this system will be a bit automated and you could do on-line and you could see that it will be a lot easier to actually be able to have a record”. (Manager User, RHO 7)

This is in line with the responses of the interviewed *HR Professionals* who reported that the new system was supposed to reduce their manual and administrative work by giving responsibility to managers for some HR processes related to the management of their teams, and to employees for keeping their personal data up-to-date.

“If we can promote and get staff to do that [change their information by themselves, etc], instead of phoning up [HR] and doing a change for them. Let them just go into the system and change it, and it's done”. (Senior HR Executive, RHO 8)

Previously, all these tasks were performed either only by HR Professionals or with the help of HR Professionals.

No empowerment related expected benefits were reported for the *Government, NHO, RHO* or *Employees*.

Realized

The interviewed *Manager* reported that the data available in the system on her team such as details on their contract's expiry date, as well as new HRIS functionalities such as the option to input feedback on new candidates, enabled her not only to plan and manage her team better, but also to do it without any involvement of HR Professionals, as had previously been the case.

"I used to its potential automatically, which I found extremely helpful, for me as a manager, because I could actually do steps without relying with HR so much...And I really liked the fact that I could do things automatically like not send forms to HR but actually write the information in the system. Also I could shortlist automatically and after shortlisting, I could also put my comments for each candidate and following me finishing the process, HR could send them an email letting them know how the interview process went. I preferred that approach a lot". (Manager User, RHO 7)

No empowerment-related realized benefits were reported for the *Government, NHO, RHO, HR Professionals* or *Employees* at the time the interviews were conducted.

6.2.3.6 Statutory compliance

Expected

NHO and individual RHOs had to comply with national regulations on equality and diversity. Thus, they had to regularly provide to the government statutory reports on their workforce diversity. The new system was supposed to ease the collection, maintenance and reporting of these data.

“To reduce risk of legal challenge potentially arising from organizational failure to meet equalities requirements”. (Project Documentation)

Realized

No statutory compliance-related realized benefits were reported for any stakeholder at the time the interviews were conducted.

6.2.3.7 Others

Expected

The stakeholders interviewed did not report any expected benefits from HRIS related to either improving organizational image or management of macro changes. However, there was another driver that triggered this countrywide HRIS implementation that emerged from the analyzed data. It was benchmarking behaviour. Thus, the *Government* benchmarked implementation of the new HRIS, to other ongoing national administrative (e.g. national finance system) and clinical (e.g. national prescribing system) IS implementation projects which were implemented or were being implemented in the studied NHO.

“It evolved management and the views that we would be looking to work as single systems in the future”. (Senior HR Executive, RHO 3)

Moreover, the *NHO* was benchmarking itself with *NHOs* in neighbouring countries and other large organizations which were already in the process of implementing national (and/or large-scale) *HRIS*.

“At the time they were doing a similar kind of process, they were ahead down in [neighboring country], [HRIS] that they have down there, so it was kind of looked at that”. (National Project Team Respondent 2)

RHOs without pre-existent *HRIS* were benchmarking themselves with *RHOs* which were actively using sophisticated pre-existent *HR* systems.

Some [RHOs] had developed [another HRIS] that some [RHOs] used and they had developed it to such that it was doing everything, it was doing all the employee relations, recruitment, holding their personal information. So that encouraged us to see the advantage of a single system”. [Senior *HR Executive*, *RHO 1*)

The interviewed *Employee*, who was from the *RHO* with an advanced pre-existent *HRIS*, reported that benchmarking the new *HRIS* with this pre-existent system revealed that the main expected benefit for him was that *“that [new system] will do more than the old systems used to do”*. (*Employee user*, *RHO 8*).

Realized

No *Strategic*, *Statutory Compliance*, *Organizational Image*, *Patient Care*, *Generation of Interest* from other countries or *Improved ICT Infrastructure* related realized benefits were reported by the interviewed stakeholders.

However, members of *HRIS Team* also reported, such benefits of this ongoing project as *“keeping them on the job”*, while the *Project Manager* stated that their

RHO had a business benefit from seconding them to other RHOs who were still in the process of HRIS implementation.

Some *HR Professionals* were concerned that the reduction in the level of quality of services they provided to their internal customers resulted from the increased workload (associated with the new system implementation) together with the system’s technical and functionality issues (especially with the new recruitment module), would affect the reputation of their HR Departments, as well as the reputation of their RHOs and NHO as an employer in general. In addition, *HR Professionals* were also concerned that candidates who face some technical problems with the new system (e.g. errors while filling recruitment applications), might not re-apply for future advertised jobs. Taking into consideration NHO’s challenges with the recruitment of medical staff, this was seen as a huge potential risk they wanted to avoid.

6.2.4 Factors affecting realization of expected HRIS benefits

The national HRIS implementation project is very complex, and was affected by numerous diverse socio-technical factors (see Table 9). In fact, in this project I accumulated evidence of all of the factors of influence from Kwon and Zmud’s (1987) framework, as well as the additional two factors I identified in my systematic review on HRIS in health (Tursunbayeva et al., 2016).

Table 9. Factors of influence that shaped HRIS project (national case)

Factors of Influence	Exemplary Quote
Environmental	<i>“Now the health service has been cut back, cut back, cut back, as all public sector have, and there isn’t this spare</i>

	<p>capacity. Well I don't think there ever was but there isn't even the opportunity to find any spare capacity or even go and ask for additional funding because the answer is quite firmly no, there is no extra money. So again, your hands are tied by the kind of financial pressures of doing a big project within a public sector". (National Project Team Respondent 2)</p>
Inter-organizational	<p>"I think they've had challenges. They've had changes in people. When I first started in this [RHO] testing had become a problem because they had lost people with the skillset of knowing [the new HRIS] because they had moved away and they had lost people who knew payroll and when it come to interface it was very difficult to test that interface because actually they didn't have the skillset to know so therefore there was some recruitment had to happen, then training and all that side". (eHealth Respondent)</p>
Organizational	<p>"I would say that there was a degree of difficulty because you've got [numerous RHOs] with different systems currently in use. So to merge all the systems to a system that suits all the [RHOs] and all the processes and systems then I think the range now of the specification became quite wide. So I think that caused a difficulty and still is a difficulty today". (HR Professional, RHO 5).</p>
Individual	<p>"If [employees] been in the company 20-30 years they're just not used to doing it and so hopefully they'll pick it up at some point. But it is quite difficult to get the hang of if you're not used to it". (HR Professionals, RHO 7)</p>
Task	<p>"I think if we're implementing [new HRIS], particularly the recruitment part of it, then as an [NHO], we all need to agree what the process is for recruitment so we're all doing the same thing. So that's where I think we've had some difficulties with parts of the system, and it's not been the fault of the "vendor". It's been where maybe [RHOs] can't agree". (Senior HR Executive, RHO 8)</p>
Technology	<p>"For every module that's come out, we have then said 'well that won't work' and it's back to the chicken and egg, so what you should actually have done is we should have said collectively as a group to the [NHO] 'this is it and we're not changing it', but what we did is allowed everybody freedom to say 'well it would be good if it could do this and it needs to</p>

	<i>do that' and it's just had so much change attached to it".</i> (Senior HR Executive, NHO 2)
Project	<i>"[Data migration did not go great] I think it was because, you know, we didn't understand a lot...We didn't have someone specific to work on these projects, so we did that along with our day jobs. So it was very time consuming, so we're trying to juggle our day job with implementing [HRIS], so it hasn't been easy".</i> (HR Professionals, RHO 5).

6.2.4.1 Environmental

Significant resource constraints shaped the project from inception all the way through development (e.g. a reduction in the initially created specification) to roll out to RHOs (e.g. small national and local project teams). Some respondents attributed these resource limitations to the public sector culture of the healthcare industry, whilst others explained it with reference to the global financial crisis of 2007-2008, which restricted the resources that NHO and each RHO were able to dedicate to the project. Many respondents attributed the resource limitation to both public sector culture and the economic environment.

Moreover, NHO is required by law to collect, store and report extensive data on their workforce. Thus, the amount of data that NHO had to migrate from their pre-existent paper and HRIS systems was enormous. This was also influenced by a great number of organizational changes NHO has been going through to achieve efficiency through streamlining existent organizational processes, which resulted in amendments to some employee information (e.g. changes to job titles). Consequently, the data migration, made harder by the amount of information that had to be migrated, was particularly labor-intensive and time-consuming, and was still in process in progress in several RHOs at the time of data collection.

Therefore, the interviewed HR Professionals reported that they did not have confidence in rolling out to managers and employees the new system since it did not have accurate and up-to-date data; at the time of data collection the new HRIS was used mostly by pilot departments within RHOs.

6.2.4.2 Inter-organizational

The HRIS system was developed and is licensed by a US-based multinational computer technology corporation (system supplier), with a very strong reputation for working in complex organizations from various sectors. However, the system was procured from an international ICT vendor had already provided NHO with a number of other national-level ICT services.

The interviewed respondents reported that although this vendor already provides and supports diverse clinical and workforce systems for NHO, they were not happy with how they executed this particular HRIS project. They reported that the vendor was distracted by other projects they were involved in, had a very high turnover of their key project participants, and as claimed by respondents also had little previous experience of working with the HRIS system supplier. These factors combined significantly affected the project delivery, causing delay and a reduction in NHO's stakeholders' satisfaction with the quality of project delivery and support the vendor provided.

6.2.4.3 Organizational

The NHO is characterized by a great diversity of individual RHOs in terms of size, geographical location, procedures and practices, composition of staff,

availability and accessibility of computers, staff computer literacy, HRIS systems used, and HR professionals' and staff's experience of operating these systems. These diversities significantly affected the new HRIS implementation project. For example, I observed a variety in the RHOs' attitudes towards the new HRIS. Thus, RHOs without pre-existent HR systems were enthusiastic about the new system and very positive about its expected benefits. In contrast, RHOs which were already using another HRIS, in most cases bespoke systems developed long ago through a bottom-up process, reported in all cases a positive experience with their existing HRIS, and were in contrast highly cautious about the new system. These RHOs were concerned about the changes that the new HRIS would bring to their existing processes and practices, about the relative performance of the new system compared with their existing HR systems, and about the ability of the new HRIS to allow them to continue to provide the kind of HR services that the RHO's employees were used to.

6.2.4.4 Individual

The feedback from the system users was varied and depended greatly on their individual characteristics. Some users were very positive, actively defending the system, whilst others viewed the system as complicated and non-user friendly. The former tended to be relatively new in their positions within the health sector and/or with prior work experience in the private sector. As yet unacclimatized to the healthcare sector culture, these users perceived the new system as modern and in keeping with their expectations of what an information system should look like. Such users also found the system's operational logic and the structure of the

processes that it was imposing appropriate, and helpful in enabling them to conduct their work. In contrast, the users who had worked in the studied NHO for some time tended to describe the new system as both non-user-friendly and as not conforming to their underlying assumptions and expectations about what HR working processes should entail.

Overall, the use of the new system across the RHOs was very limited at the time of the data collection. Thus, it was reported to be used mostly either within HR departments, with some rare exceptions when the system was piloted by other departments outside HR. This resistance to adoption of the new system at the individual level was caused across the RHOs by the users' gradually decreasing lack of confidence in the system, which was further augmented across the project hierarchy by the negative "word of mouth" caused by the system's technical and functionality issues and by project delays.

6.2.4.5 Task

The system development and configuration processes were significantly complicated by the variety of pre-existing HR working practices across the RHOs, as any configuration tended to raise the question of which RHO's best practice should be followed when adapting the system. Thus, for example, analyzed data reveals a marked reluctance within most RHOs to abandon their existing HR working practices and/or HRIS. This resistance to change was first manifested during the development of the initial specifications by the central project team, which was informed by extensive consultation with a wide range of representatives from the various RHOs.

The reluctance to change existing processes and practices also manifested at various hierarchical levels and across different departments within RHOs, but was less noticeable among HR professionals, primarily local HR leaders. Some of the central team respondents mentioned that this might be because very few system users outside of HR participated in the consultative process during the system development and implementation stages and as such their feedback has not been sufficiently taken into account during the implementation of the system.

On a positive note, the process of configuring the system opened up a dialogue between RHOs on reconsidering their operating procedures, and triggered an opportunity to move standardizing NHO HR practices. This was widely perceived by the central team as actually a significant step forward towards the vision for transforming the national HR operating framework and for creating the model of shared services across NHO's HR that was envisaged in the Government's political discourse.

6.2.4.6 Technology

The design of the HRIS system itself embeds a set of assumptions about the working practices, procedures and activities that system users will engage in. According to the respondents who were involved in the project development stage, these are consistent with the private sector and the US national context in which the system was developed by its US-based vendor. In contrast, most of the respondents, be they developers, implementers or system users, perceived that these assumptions were clashing with the norms, values and practices that characterized their own, public sector and European context of use. For example,

many respondents claimed that this system was designed for private US, global companies and as such the practices and terminology embedded in the system were incompatible with the studied NHO, or public sector environment in which they operated.

The normative difficulties associated with the reconciliation of the operating logic embedded in the system, versus the context of use, were exacerbated by the technical difficulties associated with configuring the system to suit the studied NHO. Although the system was recognized as having a reputation for working in complex organizations across the globe, this was an off-the-shelf system, and as such inflexible and difficult to adjust to local contexts of use. This inflexibility was in contrast to the experience that some of the RHOs had with their current bespoke HRIS which allowed wide customization to local working practices and conditions. This clash between the new, off-the-shelf HRIS and the existing, bespoke HRIS in use, exacerbated the frustrations of the local RHOs with the prolonged and difficult process of trying to find ways of adapting the new system to the current and varied working practices within the RHOs. Moreover, the contract precluded customization of the system (i.e. changes in coding), and accommodated only high level configurations of the system which led to the RHOs having to find work-arounds to make the system usable. Following numerous RHOs' complaints, significant time, effort, and resources were invested in configuring this off-the-shelf system to better suit the NHO's working procedures and practices. This prolonged configuration process led to further delays in the implementation process, and to confusion between the different stages involved in the development, implementation and, in some RHOs, the use

of the system. Overall, the delays, the work-arounds to adapt the system to NHO practices, and the confusion between stages had negative consequences for the system's performance, further increasing the project's costs and delays.

In view of these difficulties, many of the respondents thought that the original off-the-shelf system should first have been rolled out, before investing in extensive efforts to adapt it to the requirements of individual RHOs.

A further difficulty raised by the respondents involved overlapping of functionalities between the new system and existing, nation-wide, NHO IS. For example, some of the NHO's existing workforce systems already perform some of the activities enabled by the new HR system, such as requesting annual leave. Such overlapping might generate a potential conflict between various systems in use in the future, as well as raising uncertainty about which system should be used to perform this activity to avoid duplication of effort.

Moreover, it was originally envisioned that this new HR system would be integrated with other already existing NHO IS (e.g. the already successful Payroll system); however, integration proved to be another challenging exercise, as the systems were not fully compatible, nor were the teams supporting these systems able to prioritize interfacing with the new HRIS.

Last but not least, some respondents believed that the perception of the HR system as merely administrative, might have put it at a disadvantage compared to clinical projects when competing for scarce resources from the central organization and stressed the need to argue for its strategic importance.

Due to all of the aforementioned technical and functionality issues encountered some RHOs adopted the new system only partly such as adopting only the core

HR and Employee Relations and/or Learning Management modules, with many of the RHOs refusing to adopt the iRecruitment module until more evidence can be provided by the central project team concerning the new HRIS system's technical feasibility. In extreme cases, some RHOs with existing HRIS even withdrew from the planned implementation of the new system as soon as the first technical issues and project delays appeared, and/or were considering other alternatives to the system modules they were not happy with (e.g. to continue using a particular module of their existing system). RHOs which withdrew preferred to wait for later stages of the project implementation, once other RHOs had demonstrated that the new system is fully functioning and fit for purpose. These differences of approach to adoption of the new system among RHOs significantly affected the delivery of the expected benefits, as they challenged two components that were key to the new system delivering its benefits, including the condition that all the new system modules would be used equally by all RHOs.

6.2.4.7 Project

The new HRIS project was executed in accordance with pre-existent NHO norms. Thus, for example, the central development team engaged in extensive consultative processes throughout the NHO that are typical for health sector projects with a variety of stakeholders in an effort to generate consensus around the reduced system specification and thus buy-in to the system.

The project governance structure was originally set up with a relatively small national level project team tasked with the coordination of centralized activities (e.g. data migration processes between the RHOs and the vendor), while each

individual RHO would have full responsibility for local implementation. This approach assumed that the costs of local implementation would be covered by RHOs' existing budgets. This set-up initially had the support of the RHOs' HR Directors. However, the financial crisis resulted in reductions in the resources available for the public sector in general, and the NHO in particular. As such, when the RHOs began local implementation, resources that had been anticipated were no longer available. Therefore, for most RHOs, HR professionals with existing full time job responsibilities and without special project management training nor experience of running complex projects of this nature were assigned to take responsibility for this project.

During system implementation, RHOs had received similar instructions and support from the national project implementation team. However, most of them either adopted their own implementation strategies, with widely differing levels of success, or challenged some of the proposed solutions, arguing that they were incompatible with local procedures.

Due to all of the challenges that the project faced, the RHOs using HRIS demanded more evidence from the central project team concerning the new HRIS system's technical feasibility. As the project was being stalled by technical problems and lack of willingness of RHOs to engage in implementation, the central team responded by arranging to launch a "pilot project", where three selected RHOs would implement the new system with the aim of validating all transactions within the system, compiling a central resource of standard operating procedures, developing essential training materials and creating a "lessons learned" report. However, most of the respondents stated that this pilot project

should have been conducted earlier, either before or during phase one implementation. This would have helped resolve all the technical and functionality issues during the pilot, and to generate and share best practice regarding system implementation before beginning to roll out the system across the individual RHOs. Although a post-implementation sharing of lessons learned after each phase had been in reality planned from the outset of the project, it was not fully realized because each phase implementation was taking longer than expected and some RHOs were postponing their implementations. These delays were due to the unforeseen technical difficulties associated with developing the system to fulfil the NHO requirements, and the strong resistance to change that the system met at during the implementation. These delays led to an overlap in implementation phases between RHOs, which meant that the problems identified at earlier stages were not resolved before the system was rolled out to the RHOs in the next phase. This problem was visible to the RHOs and further eroded their confidence in the project.

6.3 Regional case study in Country 2

6.3.1 Regional case study setting: NHO and its HRIS strategy

The RHO in concern is one of the biggest RHOs in the studied EU country. It serves a very large and geographical dispersed territory, counting more than 500,000 residents. It includes 2 major hospitals, 5 district hospitals and 13 health districts. It also has established relationships with numerous private and residential care homes. It has more than 1,800 patient beds, circa 8,000 employees, and circa 1,000 interns and contractors.

In the last decade, the studied RHO has experienced a phase of rapid growth (e.g. budget increase from 630 to 1,000 million euro and 5.3% headcount increase between 2006-2009). This growth has called for a change in the organizational processes and IS in order to ensure that the health services provided by the RHO match the growing expectations of citizens. Thus, the RHO created a “Strategic Business Development Plan” which also included changes to the HRM processes and the IS that are supposed to support them. In particular, it underlined the importance of health workforce skills for delivering a high quality of patient care. This created the foundation for the “HR Development Program” that included the transformation of the HR department, and development of strategic HRM practices such as creating a structured system of organizational roles or improving employee development and career support services. Finally, the design of an IS to support these new HRM practices was identified as an important component of this program. Detailed information about the “HR Development Program” and its components is presented in the Table 10.

Table 10. Main content of the HR Development Program

Duration	Project description	Content
Circa 10 months	Organizational design	<ul style="list-style-type: none"> ➤ Analysing HR Processes (as is - to be) ➤ Designing RHO’s professional’s model (organization, roles, people) ➤ Testing the new competence development model for the selected roles (Head of Medical Unit, Chief Nurse) ➤ Developing specification for the new HRIS
>20 months*	Change management	<ul style="list-style-type: none"> ➤ Aligning processes and organization ➤ Extending the competence model to other roles

		<ul style="list-style-type: none"> ➤ Selecting and procuring the new HRIS ➤ Implementing the new HRIS
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*includes also HRIS selection via European tender process (duration over 6 months)

6.3.2 The HRIS project

As stated in Table 10, the HR processes analysis (as is and to be) also served to create the new HRIS specification, which was acquired later through a European tender process. The public procurement process followed by the RHO is described as innovative in the project documentation, mainly because it contains the request for information procedure, and it is regularly used by private companies to collect written information on current or future suppliers. The RHO received 15 proposals, which offered both off-the-shelf market solutions, as well as development of customized, bespoke HRIS. The main evaluation criteria adopted by the RHO focused on HRIS functionality, cost, as well as potential risks associated with either developing bespoke or buying an off-the-shelf solution.

The main advantages for developing a customized solution were identified as:

- Low initial investment, as there was no need to procure a system licence;
and
- Greater compliance with the specific organizational and functionality requirements (at least in the short term)

The main advantages of procuring an off-the-shelf system included:

- Minor configuration cost, correct system maintenance and better technological scalability;

- Shorter time for new HRIS implementation (e.g. fewer required developments);
- Others, such as less risk and greater functionality.

After careful evaluation, the RHO decided to procure an off-the-shelf system, because it was supposed to support the new “HR Development Program” by avoiding replication of their pre-existent HRM practices, but instead aligning them to those of other large and complex organizations. Thus, great care was devoted to developing the new system’s functional specification to ensure that it responded to all of the main “HR Development Program” requirements (e.g. supporting the RHO’s staff management, development and evaluation).

The procured HRIS includes HR, Employee Relations, Performance Management, Self-service HR, iRecruitment, and HR analytics modules. The project officially finished in 2010, however, the HR change management program was still in progress at the time of data collection. Therefore, the new system is still being developed (e.g. new functionalities have been added to it). The main expected and realized benefits of this project are discussed in the following sections together with the factors of influence that affected this project.

6.3.3 Expected and realized benefits from HRIS and recipients of HRIS benefits

6.3.3.1 Operational efficiency

Expected

The main expected operational benefit for the *HR professionals* and the HR department, as a whole, was rationalization and optimization of the previously fragmented and disintegrated processes, carried out partly by diverse HR professionals and in extreme cases even departments (e.g. the administrative IS team was responsible for some HR processes).

“Uno degli obiettivi del progetto era quello di intervenire sull’organizzazione dei servizi di supporto, cioè dell’HR... E di fatto abbiamo dei processi che sono abbastanza disintegrati... Allora avevamo anche ripensato in maniera tale che l’organizzazione di questi uffici cambiasse anche un po’, come dire, le proprie responsabilità..., cioè anche un po’ di razionalizzazione, di ottimizzazione”.

(Administrative IS team respondent 1)

It was also expected that automation of previously complicated, time-intensive and error-prone Excel, Access or paper-based HR processes would also provide some paper and time savings. Finally, it was envisioned that some HR processes (e.g. performance management) would become more transparent and efficient by revealing all the process owners and/or participants. Thus, for example, the *HR professionals*, *Line managers* and *Employees* involved could set up or monitor important deadlines directly in the system or know who to contact in case of any questions.

“Una volta, quando non c’era il sistema, c’era un periodo di valutazione che non è mai un giorno, no? però è un po’ come una scatola nera, tu inizi il periodo, mandi le informazioni e poi sei lì che aspetti. Arriva l’ultimo giorno, insomma la scadenza, e poi qualcosa ti ritorna, qualcosa no, non lo sai – mentre con il sistema lei ad esempio è in grado di vedere esattamente chi ha fatto la

valutazione... se uno ha ancora aperto o meno, se uno ha fatto l'approvazione o no". (Administrative IS team respondent 1)

Finally, it was underlined by our respondents that the reduction of HR personnel was never set up as an expected operational benefit from this project.

Realized

Not only has the new HRIS replaced some pre-existent IS and/or Excel/Access based systems, but it has also been integrated with other irreplaceable ones, which eliminated the need for the *Administrative IS Team* to support diverse IS.

[Pre-existent HRIS] l'abbiamo cancellato. In sostituzione abbiamo portato [Pre-existent HRIS] dentro a [new HRIS], quindi è un altro sistema che è stato cancellato in seguito all'implementazione di [new HRIS], ecco. Con sicuramente qualche vantaggio, ma il primo dei quali è anche di non avere due sistemi diversi, quindi cancellarne uno che già come manutenzione, costi ..." (Administrative IS team respondent 1)

For the *HR professionals*, the realized operational benefit included automation and simplification of routine administrative processes (e.g. enabled online recruitment applications), which transformed their previously "monotonic" work (e.g. eliminated duplication of effort, enabled automatic reminders), and provided time to focus on more strategic HRM practices.

"Sono stati semplificati alcuni processi, sono stati semplificati alcuni aspetti organizzativi, sono state tolte delle duplicazioni. Sono state fatte delle azioni anche interne di ottimizzazione". (System supplier key project participant)

These outcomes also led to produce realized benefits for *Managers*. Finally, a specific realized benefit for *Managers* and *Employees* was reported to be the

possibility of updating their employment data (e.g. education, years of service) or automatically creating their curricula containing all their employment data (see Standardization sub-section for more details) without any involvement of the HR professionals.

“In ogni caso è un sistema che viene usato ed è gradito usarlo perché gli utenti si rendono conto che senza questo sistema il lavoro sarebbe molto più macchinoso ... per esempio l’avviso che arriva, guarda che dovevi assegnare gli obiettivi. No. Hai finito, devi cominciarne un altro. Anche questa modalità è molto gradita agli operatori che lo utilizzano, perché gli consentono effettivamente di gestire una mola di lavoro importante che sulla carta non sarebbe gestibile insomma. Meno gestibile ecco, questo sì”. (Care Processes Governance team respondent)

6.3.3.2 Service delivery

Expected

RHO conducted a comprehensive employee survey, as part of its certification by the European Foundation for Quality Management (EFQM).

“In più venne fatta una indagine sul personale, una prima indagine sul personale dove si lamentava, da parte della – quindi un employee survey- dove si lamentava, che -i servizi del personale avessero un’impostazione un po’ troppo vecchia, troppo amministrativa”. (Administrative IS team respondent 1)

The results of this survey revealed that *Employees* were not satisfied with the services that the RHO’s HR department provided; they considered their HR department as holding only an administrative support function, and wanted it to provide also more strategic HRM services (e.g. career development).

Realized

No realized service delivery benefits were reported by the respondents I interviewed. It was however noted that the following *Employee* survey (conducted after the completion of the project) demonstrated higher employee satisfaction with the level of services provided by the RHO's HR department.

“In quest'ultima che è stata fatta nel 2014 sul personale, interna, è stata rilevata una soddisfazione molto maggiore del personale”. (Administrative IS Team respondent 3)

6.3.3.3 Standardization

Expected

Although the RHO had a regional payroll administration system, there was a wide variety of paper or Excel/Access-based IS supporting fragmented and diverse HR processes for different users (e.g. clinical and administrative staff).

This dispersion sometimes caused the *HR professionals* having to enter the same data into different IS. Therefore, it was envisioned that standardized HRIS would replace all the pre-existent HRIS (except payroll), and allow to have all RHO's HR data in one place.

“C'era il sistema per il Payroll...Poi c'era il sistema di gestione dei concorsi, quindi tutta la partita di acquisizione, che era un altro sistema ancora e più altri, beh sulla formazione, sulla gestione delle valutazioni annuali, dei dipendenti, erano gestite su Excel, quindi erano più sistemi, se non proprio sistemi comunque anche database diversi tra di loro... Quindi serviva un unico software che

raccogliesse tutte queste informazioni insieme". (Administrative IS team respondent 2)

Realized

It was reported that the HRIS assisted the *HR professionals* to standardize some of their HR processes. For example, the employees' curricula that are required to be posted on the RHO's website by the Country legislation can now be generated in a standardized format from the new HRIS.

"Tutti standardizzati. Così sono tutti uguali. Non è granché, però insomma è abbastanza ordinato. Quindi, annualmente viene chiesto ai direttori di aggiornare il loro CV e annualmente loro poi confermano di averlo fatto in [new HRIS]. [HR professionals], il gruppo di lavoro, li raccoglie e li pubblica. Li verifica velocemente e li pubblica. Questo tramite [new HRIS] ci consente di avere degli standard uguali". (Administrative IS Team respondent 3)

6.3.3.4 Compliance

Expected and Realized

The RHO in concern is located in an autonomous region of the studied EU country, and enjoys an autonomy also in its health system management. It is still required to provide national statutory reports on its health workforce composition. However, the data stored and generated from their pre-existent payroll system was reported to be sufficient for this purpose. Therefore, there was no expected or realized benefit from the new HRIS associated with the statutory compliance for any project stakeholder.

6.3.3.5 Empowerment

Expected

The expected benefit for the *Line Managers* included having all data related to their teams in one place which was supposed to empower them to manage their teams better. The expected benefits for all *Employees* was expected to include the creation of an individual electronic employment record, that they could update as required without asking for HR professionals' help. It was also envisioned that the new system would include a fully functioning self-service module that *Managers* and *Employees* could use for processing diverse HR requests, such as generating and/or approving self-assessment and mobility requests. This, as a result, was supposed to free up *HR professionals'* time for more advanced HRM practices (see Strategic section for more details).

“Ed era, almeno questo è quello che dimostrava, di avere un uso abbastanza friendly, cioè una possibilità di utilizzo da parte di tutti gli utenti, quindi non solo da parte di fruitori primi, cioè di coloro che gestiscono direttamente le risorse, ma anche da parte dei fruitori ultimi, quindi di tutti coloro che a vario titolo hanno a che fare con il sistema. Quindi queste erano le caratteristiche che all'epoca c'erano sembrate importanti per scegliere questo sistema invece che un altro.” (Care Governance Processes respondent)

Realized

The new HRIS provided the *Line managers* and the *Care Processes Governance team* with an access to up-to-date and accurate data on their teams and on the whole RHO staff, respectively. This was reported to improve the RHO's HR

management and clinical services planning, by allowing to estimate the required health workforce.

“Che è il motivo per cui è stato messo in piedi il sistema. L’altro, al di là di una fotografia della lettura, della fotografia statica, è la possibilità di pescare dentro al sistema appunto le informazioni che servono aggregate. Quante persone in questo momento possono fare questa cosa. Quanti professionisti hanno questa caratteristica. E così via. Questo è assolutamente un beneficio. Che percentuale di persone in questo momento c’è in aspettativa. Quanti infermieri abbiamo rispetto, che percentuale di infermieri abbiamo rispetto agli operatori socio sanitari. Quante persone di ruolo ci sono. Tutte le informazione che sono contenute sono immediatamente fruibili, senza dover fare richieste al servizio personale, etc. etc.”. (Care Processes Governance team respondent)

Finally, the new HRIS has also empowered *Employees* to take control over their personal employment data, and allowed them to update it as necessary, without any involvement of HR professionals.

6.3.3.6 Strategic

Expected

This project was mainly prompted by the *RHO*’s two strategic objectives that were incorporated into its three-year Strategic Business Development Plan. Firstly, it was the *RHO*’s intention to obtain EFQM certification, which required to improve internal processes within the organization (including those of the HR department).

“L’esigenza è nata un po’ di anni fa, nel 2008/2009. L’allora direttore generale aveva rilevato che attraverso diversi momenti e attività che sono una rilevazione per la - diciamo, che era stata fatta sul personale, in ambito EFQM, EFQM che sarebbe l’European Foundation for Quality Management. Noi siamo un’organizzazione accreditata EFQM e la prima rilevazione venne proprio fatta intorno al 2008/2009 e venne fuori giustamente, vennero fuori, vennero rilevati degli aspetti di miglioramento un po’ in tutte le aree comprese quelle del personale”. (Administrative IS Team respondent 1)

Secondly, it was the RHO’s need to transform the role of *HR*, that previously focused only on administrative HR services required in public sector organizations by the country and regional labor legislations (e.g. time and attendance monitoring or payroll), into a strategic function also performing transparent and objective HRM practices (e.g. performance management process).

“Noi prima come tutte le aziende pubbliche avevamo, abbiamo tuttora dei sistemi, ma sono dei sistemi che garantiscono la parte burocratico-amministrativa. Quindi naturalmente timbrature, le buste paghe, gli stipendi, tutto quello che ha a che fare con la normativa. Ma tutto quello che è gestione vera delle competenze, diciamo così, ha bisogno di uno strumento ad hoc, cioè costruito perché possa supportare tutto questo. Quindi questa è stato la motivazione iniziale per la quale dotarsi di un sistema di supporto”. (Care Governance Processes team respondent)

The new HRIS was supposed to support this HR transformation by automating routine administrative tasks, and freeing up time for *HR professionals* to dedicate to more strategic, managerial practices, thus also increasing their competence.

“Sostanzialmente tutto nasce da un piano triennale 2007 di [RHO], in cui si definivano una serie di obiettivi, di evoluzioni, richieste necessarie nell’azienda, da un punto di vista di business, di servizi, di servizi sanitari, sociosanitari, di organizzazione etc. Questa nuova evoluzione, questa nuova strategia richiedeva, all’interno di questo documento, si faceva particolare menzione della necessità di lavorare anche sulle risorse umane, intesa come motivazione, competenze, per ruoli e managerialità nelle managerial skills e leadership skills diffuse”.

(External consultant)

The HRIS was also expected to provide high-quality data for decision making which was identified as a huge benefit for the *Care Processes Governance* team.

In summary, these two combined strategic objectives were supposed to advance the quality of health services delivered by the RHO.

Realized

The implemented HRIS supported the HR transformation project and assisted the *RHO* to obtain EFQM certification.

“Il sistema nasce a supporto di un cambiamento organizzativo che abbiamo messo in atto. Per cui prima non c’era ma non c’era neanche l’organizzazione”.

(Care Processes Governance team respondent)

The realized benefit for the *HR professionals* included automation of previously manual administrative activities, and the launch of the new strategic HRM practices such as performance management, employee development and succession planning, which were labelled as more transparent and objective. Moreover, it was also reported that the new system enabled the growth of the *HR professionals’* competencies and motivation.

“In una parte della direzione delle risorse umane, c’è stata una crescita interna di competenze, di consapevolezza su un ruolo più strategico e queste sono le cose che sono state, che sono successe”. (External consultant)

For the *Care Processes Governance team*, the project enabled an access to the up-to-date, high quality workforce information that they could use for strategic decision making. These data were previously only provided to the *Care Processes Governance team* upon request to the HR.

“La possibilità di avere a disposizione dati, i dati appunto e un’elaborazione molto semplice, di dati che riguardano il personale, per cui per quanto riguarda me, il mio lavoro naturalmente avere la possibilità immediata di controllo, ripeto dov’è la persona, dov’è incardinata, perché dentro ovviamente c’è tutto l’albero delle gerarchie etc. quindi la fotografia immediata di quelle che sono l’organizzazione, i processi fino alla singola persona. Dai sistemi di valutazione appunto all’assegnazione degli obiettivi e questo è un vantaggio assolutamente”.

(Care Processes Governance team respondent)

Despite the aforementioned strategic benefits achieved, respondents from the *Administrative IS team* mentioned that the opportunity to eliminate some inefficient and defragmented HR processes has not yet been fully used (e.g. for HR professionals to become fully responsible for performance management process which is now being performed partly by the *Administrative IS team*). Moreover, since the system is being constantly developed (e.g. additional functionality has been added to the Self-service module), some of the benefits from the new HRIS were reported as not yet fully achieved.

6.3.4 Factors affecting realization of expected HRIS benefits

This regional HRIS implementation project was very complex as it accompanied the RHO's comprehensive HR transformation program. It was shaped by all of the socio-technical factors of influence from Kwon and Zmud's (1987) framework, as well as two additional factors I have identified in my systematic literature review on HRIS in health (RQ3).

Table 11. Factors of influence that shaped HRIS Project (regional case)

Factors of Influence	Exemplary Quote
Environmental	<i>“Perché noi siamo soggetti a molti controlli, molte regole, in particolare in [the studied EU country] molto più che in altri Paesi che, da questo punto di vista, hanno dei sistemi di burocrazia più evoluta per così dire”.</i> (Administrative IS team respondent 1)
Inter-organizational	<i>“I consulenti del system integrator, dei vendor, conoscono bene il sistema ma conosco poco, non benissimo, tutte le alternative di processi, di strategia, di metodologie di risorse umane. Le persone che lavorano nelle risorse umane non conoscono il sistema, non sanno se quello che chiedono è facile o difficile, se costa 1, 10, 100 in termini di export e decidono. In più a volte, come dicevo prima, non sanno esattamente che cosa potrebbero chiedere, chiedono quello che sanno... E quindi il nostro compito è quello di tradurre, fare da traduttore simultaneo tra uno che parla in cinese e uno che parla indiano, in inglese. Quindi una terza lingua che permette di vedere altre cose che né chi parla indiano né chi parla cinese riesce a vedere”.</i> (External consultant)
Organizational	<i>“In un'azienda grande e complessa come la nostra che è formata per il 90% di professionisti, quindi ognuno è portatore di questa mole enorme di competenze che sono il patrimonio della nostra azienda, o esiste un sistema informativo informatico che supporta tutto questo altrimenti non si va da nessuna parte”.</i> (Care Processes Governance team respondent).

Individual	<p><i>“Durante il progetto c’erano anche persone che adesso non ci sono più, che c’era anche una vecchia scuola, molto passivi, cioè anche persone che partecipavano al progetto con lo spirito di uno che va al cinema, guarda il film e alla fine ti dice “ah, sì mi è piaciuto, no, non mi è piaciuto”. Beh non vogliamo questo tipo di – non c’era mai un vero coinvolgimento, proposta”. (Administrative IS team respondent 1)</i></p>
Task	<p><i>“Ci sono stati alcuni ambiti sul quale abbiamo notato una certa rigidità e un po’ un rifiuto anche di un modo nuovo di lavorare. Un esempio di questo, ricordo molto bene, la parte di rimborsi, spese, quindi di gestione delle trasferte, rimborsi delle note spese. Mi ricordo un meeting veramente un po’ complicato nel quale siamo andati a raccontare una soluzione già definita, accettata e funzionante peraltro, ma è tutta la parte amministrativa in quel caso di [RHO] diciamo si è mostrata piuttosto riluttante comunque al cambiamento. Cosa che posso peraltro comprendere, insomma non sono, direi che questo è un aspetto che a volte può essere sottovalutato e che invece è fondamentale per il successo di un progetto. In alcuni casi direi che questa capacità di cambiare è stata un po’ difficile da gestire. Più il lavoro di [Head of Administrative IS team] probabilmente che il nostro. Però noi l’abbiamo osservato un po’ come attore, anche se un po’ esterno”. (System supplier key project participant)</i></p>
Technology	<p><i>“Noi siamo abituati più a grandi aziende del settore privato con una magari maggiore somiglianza a quello che erano, che è anche un po’ mentalità, concetti che sono anche in [the new HRIS]. Nel settore pubblico direi era, è stata, soprattutto all’inizio, un’esperienza particolare perché abbiamo dovuto fare uno sforzo un po’ di tradurre quelli che sono i concetti, tematiche, anche terminologia proprio del settore pubblico in ciò che erano invece i nostri concetti, la nostra terminologia”. (System supplier key project participant)</i></p>
Project	<p><i>È una cosa bellissima che ha fatto [RHO] che ha deciso [Head of the Administrative IS team] è stata quella di, nella gara, di mettere uno dei, di dare parecchi punti alla costruzione di una demo. I requisiti sono carta ok? e la risposta alla gara è carta. Che cosa ha fatto [RHO]? Ha scelto due o tre funzionalità chiave e ha chiesto ai vendor che</i></p>

	<p><i>volevano partecipare alla gara di venire a [RHO], di stare un giorno in cui gli avrebbero consegnato, adesso non mi ricordo esattamente com'era, in cui avrebbero dovuto realizzare una demo, su ambiente di test ovviamente, corrispondente ai requisiti segnati. Quindi io ti ho dato 200 requisiti per 200 funzionalità- 5000 requisiti su 200 funzionalità. Ora prendiamo 3 funzionalità e questi piccoli pezzi e questi, vieni, mi fai una demo, esattamente rispettando i miei requisiti".</i> (External consultant).</p>
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6.3.4.1 Environmental

The RHO is located in a country that is notorious for its elevated level of bureaucracy characterizing public sector organizations (e.g. public sector organizations are subject to numerous controls). This bureaucratic public sector culture was reported to influence the HRIS implementation project. Thus, for example, any functionality that could have any serious normative constraints (e.g. monitoring of employee time and attendance) was not incorporated into the new HRIS.

The labor unions in this country were also reported to be very influential. Thus, the project had to be discussed and agreed with them. Although the labor unions did not challenge the HRIS implementation project itself, they however confronted the launch of the related HRM practice such as the clinicians' self-evaluation as a part of their performance management process, which put this project on hold.

Finally, our respondents also reported that taking into consideration the primary focus of health organizations - patient care delivery – the RHO initiated this HRIS project only after completing all its critical clinical IS projects.

6.3.4.2 Inter-organizational

The RHO executed this project with the help of two main partners: (a) a consulting company that helped to map all their HR processes (“as is” and “to be”), and drafted the new HRIS specification; (b) a system supplier who was directly responsible for the new HRIS implementation. Both partners were chosen via independent, open EU tenders. However, the second tender for the new HRIS procurement included a clause banning the winner of the first tender (the consulting company that drafted the new system specification) from participating in it. This was stated as an important success factor that prevented the consulting company from drafting the new HRIS specification already with some IS in mind, but instead focusing on the actual RHO’s needs.

The RHO highlighted that the involvement of these two partners was beneficial for project development. The consulting company became a trusted, external point of reference (informed about all HR best practices), who could work directly with the RHO’s senior clinicians and explain them the benefits of having strategic HRM practices (e.g. performance management) and the necessary HRIS to support them. Furthermore, given that the system supplier are experts in their system, it was very easy to discuss and agree with them directly any essential system configuration/customization, although, as mentioned by the respondents, the system supplier did not have any prior experience of implementing their HRIS in the health sector in this EU country. Finally, our respondents also mentioned that the project was slightly delayed because there was a high turnover of the system supplier’s key project participants (e.g. related to maternity leave).

6.3.4.3 Organizational

The RHO in concern is one of the largest and complex in this country. It employs a wide variety of highly professional staff, and has diverse and fragmented HR processes (e.g. diversity in job codes and pay structures), which were reported to challenge the new HRIS implementation, as they required the new system to accommodate these varieties. Thus, for example, the Administrative IS team became partly responsible for supporting the new performance management process executed via the new HRIS in order to facilitate the system implementation and use. Finally, it was reported that the RHO's size and composition also affected the new HRIS use. Thus, large hospitals employing more staff have been reported to perceive more benefits from the new system, and the data that it holds.

6.3.4.4 Individual

This project had a very strong senior management support. It was also driven by respected and positive champions across the diverse RHO's functions. However, the project also faced some resistance from: (a) Old-school "bureaucratic" HR professionals who did not want to change their pre-existent approaches to work (their resistance continued until they retired and/or new, open-minded staff arrived); (b) Employees who do not have regular access to computers and/or are not very computer literate; (c) Some clinical staff, who were already using numerous clinical systems and viewed this administrative system, or some of its modules, only as an additional layer of bureaucracy/complexity added to their work.

The system is still not used by every employee within the RHO, although all pre-existent HRIS (except payroll) have already been discontinued. It is expected that the system usage will be constantly growing, as more employees start executing their HR requests via the new HRIS (e.g. transfer request); since they do not have any other alternative to do it.

Overall, it was reported that attitudes toward the new system vary mostly depending on users' personalities and their preparation level (e.g. computer literacy). It is also expected that the more HR processes are transferred to the new system, the more resistance will be opposed by the clinical staff.

6.3.4.5 Project

The approach to the project execution was mentioned as one of the key success factors of this project, which received two awards from the: (1) HR Innovation Practice Observatory, Milano Polytechnic University (HR Innovation Award in Performance Management category); and (2) The 2011 ICT Innovation Award-Milan.

The Administrative IS team executed this project in collaboration with the external consultant and the system supplier. Thus, for example, the senior external consultants first introduced the new HRM practices to be performed via the new HRIS (e.g. performance management), which eliminated some of the negativity towards these new processes or the new system.

During the new HRIS procurement, the Administrative IS team requested the participating bidders to demonstrate that their solutions could deliver the functionality required by the RHO. Thus, the system supplier (together with the

other bidders) had worked on the initial system configurations (responding to the RHO's requirements), even before they were officially selected.

The Administrative IS team underlined the following additional factors that they believe made this project successful (although it was delivered with a six months' delay): detailed documentation of the required system functionality and/or developments needed; careful testing of any new system developments prior to their launch; preparation and distribution of the corresponding user-manuals (with print screens), as well as creation of user's helpline. However, they also highlighted that more effort should have been invested into promoting the system not only among the clinical staff (as it was done in this project), but also among the HR staff to ensure their acceptance.

6.3.4.6 Technology

The new system was chosen because it offered more functionality than the other proposed solutions. Thus, the user expectations from the system were very high, also due to the strong reputation of the system supplier and the amount of the financial investment made into this project.

The biggest challenge mentioned in relation to the technology itself was the logic embedded into the new HRIS (e.g. different terminology and concepts), which was referred to as typical of large scale multinational organizations, and not public sector companies. Thus, for example, it was a challenge for the RHO, operating across geographically dispersed regions, to fit their organizational structure into the hierarchy of the new system and upload their existing workforce data according to it. Numerous configurations have been done to the system in order to

make it suitable for the RHO, including also one customization to its recruitment module (to calculate the shortlisted candidates' recruitment scores as required by the Country legislation). Some developments aimed at improving and enriching system functionality are still in progress, as the RHO has secured a three-year budget for the post-live system developments. It is expected that the new functionality will increase the system usage, as it was underlined that for the technology to fully realize its benefits, it has to be used by everyone. At the time of the data collection, the user satisfaction with the system varied among its individual modules (e.g. performance management and recruitment).

The new HRIS replaced all pre-existent RHO's HR systems except those dedicated for payroll and training, with which it has been interfaced. However, the respondents mentioned that it was challenging to interface with the system, as some data fields did not match. At the time the data were collected, the new HRIS was the biggest administrative IS in the RHO. However, it is not considered as critical, because it is perceived that the system does not have any direct impact on health services delivery.

6.3.4.7 Task

The new system development and implementation processes were significantly complicated by the defragmented and non-standardized RHO's pre-existent HR working practices. For example, the data reveal a reluctance of some HR professionals to abandon their existing HR working practices and/or HR systems, so the new HRIS had to be configured to accommodate them. However, it was reported that balance was always thought to be achieved between the system

configurations and the changes made to the pre-existent processes. Nevertheless, the respondents highlighted that due to the HR professionals reluctance to abandon a number of the pre-existent processes, the opportunity to change the previous ineffective practices has not yet been fully utilized.

6.4 Discussion

This chapter has presented the main characteristics of the studied cases, introduced the HRIS under analysis, and reported on the results that have emerged from both case studies. The comparative analysis of these findings, as well as their discussion is presented below.

I further advance Parry and Tyson's (2010) HRIS benefits model by drawing from HRIS research in healthcare (Tursunbayeva et al., 2016), thus developing an application framework specific to this context. The research findings confirm that this framework is valid, because: (1) I find all benefits categories proposed by Parry & Tyson, 2010, except the expected benefit for improving *Organizational image*; and because (2) I also find that while the regional HRIS project was driven only by the expected benefits identified in the previous research (Parry & Tyson, 2010), the larger scale national HRIS project was also driven by the particular requirements of the health sector (Tursunbayeva et al., 2016), such as achieving adherence to statutory health workforce reporting requirements (e.g. Waring, 2004; Waters et al., 2013) and optimising patient care (e.g. Thouin & Bardhan, 2009; Spaulding, 2012). In addition to the benefits from the framework I proposed, I have also identified a further expected benefit in both projects – *Benchmarking* - that can take place at different levels: (1) the level of individual

employees (who can compare the new HRIS functionality to their pre-existent HRIS); (2) the level of individual RHOs (which can compare themselves to other RHOs that already have HRIS); and (3) the level of NHO (which can compare itself with NHOs in neighbouring countries with the aim of advancing its internal processes). Benchmarking at the level of individual employees, and at the national level was evident only in the national case study, while benchmarking at the regional level manifested in both cases.

The analysis also clearly distinguished between the different categories of benefits associated with different actors involved in IS implementation. Although IS researchers called for studies on IS benefits to collate the perspectives of multiple actors (Dhillon, 2005; Shan & Seddon, 2002), most existing research on IS in general, and HRIS in particular has focused only on particular actors, e.g. HR departments (Lepak & Snell, 1998; Ruel et al., 2004), Managers and Employees (Ruel et al., 2004) and Organizations (Parry & Tyson, 2011). In contrast, a recent systematic literature review on HRIS in Health (Tursunbayeva et al., 2016) has already argued that HRIS are designed and used by a wide variety of users. My empirical analysis confirms this finding, and illustrates that benefits from HRIS projects are not only expected by various organizational stakeholders, but also can vary between them. Thus, for example, the key driver that prompted the implementation of the national HRIS project in the Country 1 was the *Government's* demand for quickly obtaining standardized workforce reports (*Operational efficiency*) that, as a result, could enable the creation and implementation of effective workforce and health policies (*Strategic*), while the main expected benefit for HR professionals was an opportunity to catch up on

their work and focus on more *strategic* HRM practices (e.g. performance management). This was supposed to happen because of managers' and employees' empowerment: with the new HRIS they were supposed to become responsible for some HR practices that were previously performed only with/by HR professionals.

In line with the existing research (Coombs, 2015; Dhillon, 2005; Doherty et al., 2012), I find that few of the expected benefits have actually been realised in the implementation projects I studied, thus confirming the need to avoid conflating the two concepts when conducting evaluations of IS implementations. The analysis finds, however, significant differences in the realisation of benefits across the two cases, with very few of the initially expected benefits being achieved for the national HRIS project, while the most expected benefits were reported as achieved in the regional project. The common achieved benefits in both case studies included: improved *Operational Efficiency* for Employees, Managers and HR Professionals; *Standardization* of pre-existent HR processes, systems or their data for HR Professionals; and *Empowerment* of Managers and Employees.

My analysis of the implementation process through which benefits are realised also provides an indication of the process through which the realisation of these benefits took place. While existing research suggests that the realisation of benefits is a process that takes place during the IS implementation (Caldeira, Serrano, Quaresma, Pedron, Mário Romao, 2012), my analysis provides clear evidence that benefits realization takes place also during IS, i.e. from the bottom up. For example, in the regional case study the benefits were realized for most of the stakeholders because the system is being used by the majority of the

stakeholder groups. Thus, as routine HR processes were automated, and end users (Managers and Employees) empowered to take care of their data and/or some associated HR processes via standardized IS, this provided time for HR Professionals to launch and/or focus on more on strategic HRM practices, and saved the Administrative IS team for maintaining this new HRIS (compared to the several IS they used to support before). Consequently, streamlined and more efficient pre-existent, as well as newly launched *strategic* HRM practices enabled the RHO to achieve their strategic goal for HR transformation, and to obtain EFQM certification.

In the national case study, the fact that the new HRIS was still being implemented in the national case study in Country 1, and not widely used by the end users (who thus could not fully appreciate using the new system and the benefits from it), might also explain why the benefits at the upper levels such as HR (partly), RHO, NHO and the Government have not been perceived to be fully realized.

These examples also demonstrate that some expected benefits were planned to be achieved for some particular stakeholders, only after they could be achieved for other stakeholders group/s. Thus, my findings for both case studies also led to the identification of a complex set of interdependencies both across different categories of benefits and between different actors.

Results of the analysis also unveil several critical requirements that the new system was supposed to meet (e.g. the system needs to be used by everyone), as well as a range of sociotechnical factors that shaped the implementation of both HRIS projects, and challenged or facilitated the realization of their envisaged

benefits, including *Environmental, Inter-Organizational, Organizational, Individual, and Project, Technology, Task* related factors.

Thus, in this study I empirically confirmed the findings of the systematic literature review, where I identified that the aforementioned seven socio-technical factors can significantly influence and shape HRIS development and implementation projects in health, as well as the perception of stakeholders about realized benefits from HRIS. Finally, as the findings of these case studies revealed more factors that can affect HRIS initiatives in health compared to generic IS implementations (Kwon & Zmud, 1987), I suggest that regional and national HRIS projects in health context are particularly complex.

6.5 Conclusion

This chapter reported on the results of the analysis of the development and implementation of two HRIS projects in two different EU countries. Drawing on the results of documentary analysis and stakeholder interviews, it compared the expected benefits driving implementation of this system with those that were actually achieved, as well as the unintended consequences and the factors which influenced these projects.

As this revealed that not all the expected benefits were achieved, I conducted an additional analysis to explore the processes of HRIS development and implementation that led to these outcomes. Results of this subsequent analysis are presented in the next chapter (Chapter 7), while the research strategy and methodology used in these case studies are presented in the Chapter 5.

7. Chapter 7

A COMPARATIVE CASE STUDY ON THE DEVELOPMENT AND IMPLEMENTATION PROCESSES OF HRIS

7.1 Introduction

The findings presented in Chapter 6 showed that the uses and consequences of innovations emerge unpredictably through complex social interactions amongst the actors involved, their responses to and interactions with the innovation, and the organizational context in which they are situated (Robert et al., 2009). This is in line with the findings of previous research examining technological innovations in healthcare, which also demonstrated that identical technologies can often produce different outcomes in different settings (Barley, 1986).

Thus, in order to understand the processes of HRIS development and implementation that led to the current project outcomes in the selected case studies, I have adopted a context-sensitive theoretical approach that accounts for interactions between technological, social and organizational systems (see Robert et al., 2009). Here I base my analysis on institutional theory, which has been widely used in examining organizational change (e.g. Scott et al., 2000) and IS (e.g. Currie & Guah, 2007) in the context of healthcare, in order to examine the processes through which complex and multiple institutional contexts shaped this HRIS project. The framework developed (see Chapter 4 for discussion) includes three dimensions related to the institutional pressures operating at different stages of the innovation project, their influence on the organizational actors' strategic

responses, and the consequent changes in the actors' collective understanding, i.e. their organizing vision, of the IS innovation project. Research results are discussed according to the three stages of the innovation that were studied: intention to adopt, adoption, and implementation. This is valuable as a means of demonstrating the evolution and influence of institutional pressures, as well as actor's strategic responses over time.

The findings of these case studies are presented in this chapter⁷, while detailed description of the research strategy and methodology adopted for this study are provided in Chapter 5.

7.2 National case study in Country 1

7.2.1 Innovation Stage 1: Comprehension/Intention to adopt

All three types of institutional pressure (coercive, mimetic, normative) influenced the NHO's intention to adopt the HRIS (see Table 12). Each of these generates particular expectations among the relevant actors, concerning the organizational issues that the new system was supposed to address, contributing to a cohesive business problematic within the organizational community.

⁷ Case studies presented in this chapter were conducted in collaboration with Dr. Claudia Pagliari and Dr. Raluca Bunduchi as a part of my research visit to the University of Edinburgh and have been disseminated in the following ways:

- University of Edinburgh Business School Workshop on "Organizational and Institutional Change", Edinburgh, UK (March 2016). Paper name: Mismatching Expectations of a National IT system for Human Resource Management in Healthcare.
- 32nd European Group for Organizational Studies (EGOS) Colloquium, Italy (July 2016). Paper name: Thinking big whilst making do: Mismatching expectations of a national human resource management system in healthcare.

Table 12. Comprehension (national case). Data structure & exemplary quotes

Institutional Pressures	Organizing vision
<i>Coercive => Business problematic</i>	
<p>Government pressure for accurate health workforce data: <i>“There was a real desire for consistent and accurate workforce information from [the Government]”. (National Project Team Respondent 1, C-CIP 1)</i></p>	<p>New HRIS will be used for statutory reporting [<i>business problematic</i>]: <i>“It should enable us to get some really good reports about the organization and its workforce”. (Senior HR Executive, RHO 2, C-CIP-OVBP 1)</i></p>
<p>Government vision for HR shared services: <i>“The overall directives come from the [Government] and they’re looking to have shared services within HR, so we all need to be working off the one system and working in the same way”. (Implementation Team Member, RHO 8, C-CIP 2)</i></p>	<p>New HRIS would replace all pre-existent HRIS across individual RHOs [<i>business problematic</i>]: <i>“HR experts got together and thought instead of having individual systems that didn't really talk to each other, we should have one national system”. (Senior Procurement Respondent, C-CIP-OVBP 2)</i></p>
<p>Government’s digital integration agenda: <i>“What I would say is, and this has been one of the fundamental things from the start, is that the system itself was required to integrate with a number of other national feeds”. (National Project Team Respondent 2, C-CIP 3)</i></p>	<p>New HRIS will become a single instance system [<i>business problematic</i>]: <i>“It should be a single instance system. There were a number of manufacturers out there who could have given us [many systems] and then kind of interfaced them together but we didn’t want that”. (National Project Team Respondent 2, C-CIP-OVBP 3.1)</i></p>
	<p>New HRIS will be an incremental step in creating joint HR and pre-existent national payroll system [<i>business problematic</i>]: <i>“I think we all believe that we’ll get to an integrated HR and payroll system but to get there, we had to do this, so we had a national payroll system to get a national HR system</i></p>

	<p><i>and then we could start to look at merging the two. So it was seen as a, kind of, incremental step to getting to where we would finally land up”.</i> (National Project Team Respondent 1, C-CIP-OVBP 3.2)</p>
<p>Enforced employee data protection law: <i>“Data Protection laws became more and more strong and protective of data and the individual and the, kind of, you should only see data if you have a need to know it. Therefore, we had to kind of stop putting stuff through a payroll system that was HR information because the payroll system was designed to pay people and knowing all sorts of things about individuals, what we collected through our payroll system we originally we collected our equal opportunities data, now there was absolutely no need for that to be known in payroll”.</i> (National Project Team Respondent 1, C-CIP 4)</p>	<p>Needed to have HR system as well [business problematic]: <i>“So we then worked on a specification for the national HR system”.</i> (National Project Team Respondent 1, C-CIP-OVBP 4)</p>
<p><i>Managerial normative => Business problematic</i></p>	
<p>Variety of HR management practices adopted to reflect the diversity within RHOs: <i>“There’s slight difference between recruiting somebody who’s in administration or management as opposed to a clinician. So although the process is similar, is the same, you know, there’s different qualifications, different things they have to look at and they go through maybe a different selection process”.</i> (eHealth Respondent, C-MNIP 5)</p>	<p>System should not be customizable by individual RHOs [business problematic]: <i>“We also didn’t want any ability for [RHOs] to be able to tweak their bit of the system to what they wanted and then find of course it doesn’t actually match up with the data in all of the other [RHOs] because unfortunately, across an organization like this, there are [many] variations of the truth if you like. So [RHOs] will implement things in their own way, they have slightly different procedures, they interpret the regulations slightly differently, they</i></p>

	<p><i>apply them slightly differently</i>". (National Project Team Respondent 2, C-MNIP-OVBP 5)</p>
<p>Need for accurate data for efficient workforce planning and management: <i>"There was a kind of belief that it's the best thing for [NHO] to have this kind of information... a huge information and very, very helpful for everybody from management and HR corporately up to [RHOs] and up to the Government".</i> (National Project Team Respondent 2, C-MNIP 6)</p>	<p>New system will enable data sharing between RHOs and ease the recruitment process [business problematic]: <i>"I mean one of the wonderful things I think about the recruitment side of things which is good, once you register on that you've got [huge number of] people who you can, as a recruitment officer if you said 'oh I've got a nursing job for midwifery' you can actually, if people have registered and said 'I'm interested in midwifery jobs' you can send them all e-mails saying 'here's a job come up' and suddenly you've got this huge number of people that you could never get hold of before. You could put an advert in the paper or you could put things on Internet sites but if they don't go and look at it, now you can actually send stuff out".</i> (National Project Team Respondent 2, C-MNIP-OVBP 6)</p>
<p>Reduce amount of administrative work for HR professionals: <i>"It would save time for the HR department because we wouldn't be doing a lot of the admin that we currently do, that responsibility would be put onto managers and that it would enable your managers to manage their tasks more effectively if they were to have all the information. What else. It would enable the HR department to concentrate on other work that they should be doing".</i> (HR Professionals,</p>	<p>Data provided to managers will help them to manage their teams better [business problematic]: <i>"Basically for the manager to have full access to their team's terms, conditions, absence, training – things like that. So that's the kind of main benefits".</i> (HR Professional 1, RHO 6, C-MNIP-OVBP 7.1)</p> <p>All staff within each RHO will use the new HRIS [business problematic]: <i>"The whole point about [the new</i></p>

RHO 5, C-MNIP 7)	<i>HRIS] is that every employee will use [it]". (eHealth Respondent, C-MNIP-OVBP 7.2)</i>
<i>Technical normative => Business problematic</i>	
Need for health workforce data to monitor statutory registrations of medical professionals: <i>"So if you're a doctor, you must be registered with the [Professional Medical Association]. If you're a nurse, you must be registered with the [Professional Nursing Association] and so it goes on". (National Project Team Respondent 1, C-TNIP 8)</i>	System will be interfaced with the system of Professional Medical Association [<i>business problematic</i>]: <i>"To have an interface from the [Professional Medical Association] to update the doctors' registrations". (National Project Team Respondent 1, C-TNIP-OVBP 8)</i>
Ensure that NHO has skilled workforce and capacity to deliver high quality care: <i>"It does touch on some of the key aims of the e-health strategy of ensuring that you've got a skilled workforce and you have the capacity to be able to deal with the workload that you've got within the organization and therefore... it does connect into e-health". (eHealth Respondent, C-TNIP 9)</i>	Data from workforce will be used for better workforce planning [<i>business problematic</i>]: <i>"Recruitment in the [NHO] is absolutely top priority at the moment. We really struggle to get people in, we've got real recruitment shortages, staff shortages and things like that". (National Project Team Respondent 2, C-TNIP-OVBP 9)</i>
<i>Mimetic => Business problematic</i>	
Similar ongoing national IT projects in the neighboring country NHO: <i>"At the time they were doing a similar kind of process, they were ahead down in [neighboring country], [HRIS] that they have down there, so it was kind of looked at that". (National Project Team Respondent 2, MIP 10.1)</i>	New system is used by other complex organizations: therefore, NHO should also adopt one [<i>business problematic</i>]: <i>"If you look at the "system supplier" system, the "system supplier" product has been very successful... You know, there's some large organizations with-, and there's some worldwide organizations who just have the "system supplier" product and it works". (Senior HR Executive, RHO 2, C-MIP-OVBP 10)</i>
Similar ongoing IT projects in other large organizations: <i>"I suppose if you look across industry, most large scale organizations would have an HR system and we didn't." (Senior HR Executive, RHO 2, MIP</i>	

10.2)	
<p>Similar ongoing national IT projects in the NHO:</p> <p><i>“We’ve got quite a few national systems, clinical systems particularly. Most of those -in fact the same as this – they’re all delivered through kind of web browsers; it’s the easiest way of doing it”.</i> (National Project Team Respondent 2, MIP 10.3)</p>	
Strategic response	
<p>Acquiescence: <i>“Rather than say it’s mandatory, all [RHOs] committed to sign up to it as a consortium approach, because obviously, the view was we would want a common system across [NHO]”.</i> (Senior HR Executive, RHO 2, C-SR 1)</p>	

The key **coercive** pressure that prompted this project was a political agenda, in particular the government’s desire for more accurate workforce data in order to create and implement effective policies (see Quote C-CIP 1 in Table 12). This demand created the expectation among RHOs that the new HRIS would be widely used for statutory reporting purposes (C-CIP-OVBP 1).

Having a national HR system that would be used by all individual RHOs within the country was also consistent with the government’s vision for rationalising HR services provision within public services, in order to avoid the inefficiencies associated with multiple processes across RHOs, and facilitate consistent quality of delivered HR services. (C-CIP 2) This demand for shared services created expectations among RHOs that a core part of the business problematic addressed by the new system would be the replacement of all existing HRIS, whether digital or paper based. (C-CIP-OVBP 2)

A further coercive pressure that shaped the intention to adopt the system was the government’s strong digital integration agenda which sought to ensure that all national ICT systems are fully interoperable. (C-CIP 3) Consistent with this

expectation, managers believed that the new system would replace a wide variety of pre-existent regional systems, thus delivering a single instance HRIS rather than multiple interfacing systems (C-CIP-OVBP 3.1). Moreover, it also created an expectation that this new HRIS would be an incremental step in creating a comprehensive HR system that would include merged HRIS and pre-existent standard electronic systems to support its payroll administration activities on a national level. (C-CIP-OVBP 3.2)

This national payroll system was also used by the NHO as a main data source for statutory reporting purposes. However, as EU data protection law was reinforced, it required that employee payroll and HR information be stored in separated systems (C-CIP 4). This EU regulatory coercive pressure had also prompted the search for a new HR system to manage employee data in parallel with the existing national payroll system (C-CIP-OVBP 4).

The intention to adopt was also influenced by strong **normative pressures**, both managerial and technical. **Managerial normative pressures** were manifested primarily as the need to maintain oversight of the vast diversity of structures, processes and practices characterising NHO's HR operations, and the vision for improved efficiency through greater standardisation across RHOs (C-MNIP 5). However, the RHOs themselves are heterogeneous – they may consist of one hospital or a collection of hospitals, be large or small, urban or rural, general or specialised, thus influencing the size and composition of their workforce (e.g. clinicians, nurses, administrative personnel or drivers), as well as HR processes that are adopted to manage them. The key implication of these normative pressures for standardisation was the expectation that the system would not be

customisable by individual RHOs, thus reducing the variety in HR practices and enabling more efficient management practices (C-MNIP-OVBP 5).

A further managerial pressure was related to the government's vision that more accurate and usable data would enable more efficient workforce planning, better management/reduction of staff absences/shortages and easier recruitment and retention of staff (especially in remote and rural areas) (C-MNIP 6). A priority perceived by both the NHO and the RHOs was the severe workforce shortage, particularly in rural areas, exacerbated by an aging population. It was envisioned that the new HRIS would enable the sharing of information between individual RHOs to facilitate inter-organizational transfers to help meet recruitment needs, as well as reducing the time and administrative work associated with these processes (C-MNIP-OVBP 6).

In order to reduce the amount of administrative work for HR professionals (C-MNIP 7), it was also envisaged that data would be made available to managers to help them manage their teams better, and allow administrators to take responsibility for certain tasks previously performed only by HR professionals (C-MNIP-OVBP 7.1). The demand for accurate data shaped the organizational actors' widespread expectations that the system would be universally deployed throughout the organization, being used across all RHOs and all professions and staff, thus allowing a more accurate representation of personnel data and allowing better personnel management (C-MNIP-OVBP 7.2).

Technical normative pressure was manifested via the demand from the professional medical association for accurate and up-to-date data on NHO's medical professionals to allow for monitoring of members' professional

qualifications and registrations (C-TNIP 8). This pressure created the expectation that the system would interface with the system of the professional medical association to allow for data exchange (C-TNIP-OVBP 8).

A further technical pressure was the concern of the NHO to ensure that it has the right capacity of skilled medical workforce to deliver high-quality care to their patients, thus safeguarding patient safety and quality of care (C-TNIP 9). This technical pressure contributed to the expectation that the organizational application of the system would ensure that the data will be used to allow better workforce planning (C-TNIP-OVBP 9).

Finally, the project was also driven by **mimetic** pressures. The NHO followed the example of the HRIS adoption in the NHO in the neighbouring country, which had a very similar structure but was of significantly larger scale (MIP 10.1). Close monitoring of the neighbouring NHO was evident across a range of initiatives in health well beyond the HRIS. The intention to adopt was also shaped by the examples of similar IT implementations in other large organizations from different industries, which already had or were in the process of implementing organization-wide HRIS, and which were driven by the need to maintain their employer competitiveness (MIP 10.2). A further mimetic pressure emerged from ongoing parallel national projects to replace the variety of regional clinical (e.g. electronic prescribing) and administrative (e.g. finance) IS across individual RHOs with standardized nation-wide systems (MIP 10.3). The large number of similar projects re-assured ICT actors with respect to the technical aspect of delivery of the HRIS as similar projects were delivered through similar technical interfaces. Thus the monitoring of similarly large-scale HRIS initiatives in

neighbouring NHOs as well as organizations outside the health sector, and comparison with other ongoing IT projects, created the expectation that IS, and in particular HRIS are necessary and successful in complex organizations. (C-MIP-OVBP 10)

In conclusion, at this stage, strong coercive, normative (primarily managerial) and mimetic demands shaped the emerging organizational vision of the actors concerning the HRIS that was planned to be procured, especially in terms of the business problematic. The system was envisaged as a single point of data entry, deployed across the entire NHO, replacing a wide variety of HRIS, and providing a range of benefits across all organizational actors: to HR by reducing their administrative work; to managers, by enabling them to manage their teams better; to the ICT support team by reducing the need to support a variety of different ICT systems and through not supporting customization; to the medical staff by facilitating interface with their professional association; to RHOs by allowing better capacity allocation of skilled workforce; to the NHO by enabling better workflow data management; and to the government by facilitating statutory reporting.

The inherent contradictions within the business problematic, for example that the lack of customization (to allow better ICT support) would require RHOs to make additional changes to their existing HR practices and structures, did not seem to be acknowledged at this stage by the organizational community. The confluence of strong institutional demands for the system shaped the expectations of the community of actors which were aligned at this stage around the range of organizational issues that the innovation would address thus explaining the

willingness of individual RHOs to *acquiesce* and engage with the system (C-SR 1). The respondents emphasized that all RHOs were committed to sign up to the innovation and particularly to its envisioned application as a common system deployed throughout the NHOs.

7.2.2 Innovation Stage 2: Adoption

All three types of institutional pressure are evident during the adoption stage, generating significant shifts in the business problematic associated with the emerging vision around the new HRIS, and shaping expectations concerning the core technology and the organizational practices involved in the adoption and implementation of the system (see Table 13).

Table 13. Adoption (national case). Data structure & exemplary quotes

Institutional Pressures	Organizing Vision
<i>Coercive => Business problematic, Core technology & Organizational practices</i>	
Pressure on public sector and NHO to reduce spending: <i>“Now the [NHO] has been cut back, cut back, cut back, as all public sector have, and there isn’t this spare capacity. Well I don’t think there ever was but there isn’t even the opportunity to find any spare capacity or even go and ask for additional funding because the answer is quite firmly no, there is no extra</i>	Created expensive specification can be reduced to match available financial resources [<i>business problematic & core technology</i>]: <i>“The scope was too wide, even when we cut it down, it was going to be expensive. And we cut it -, it was quite easy through discussion with our HR directors to say ‘right, we’ll take that out, we’ll take that out, we’ll take that out and this is what we’ll then go for”.</i> (National Project Team Respondent 1, A-CIP-OVBP/CT 1.1)

<p><i>money. So again, your hands are tied by the kind of financial pressures of doing a big project within a public sector”.</i> (National Project Team Respondent 2, A-CIP 1)</p>	<p>Chosen restricted procurement process was suited for tight specification and available budget [organizational practices]: “So at that point, we started looking at the invitation to tender, then all tendering process and you can either do an open procurement or a restricted procurement and we decided that because our spec was quite tight, we would go for a restricted procurement, which should have cut down on the time that it took to go through the procurement process”. (National Project Team Respondent 1, A-CIP-OVOP 1.2).</p>
<p>Regulations on equality of diversity: “There are so many guidelines and regulations that the [NHO] puts in place and probably public sector does this around equality, around the ability of managers to do recruitment and so on and so forth”. (National Project Team Respondent 1, A-CIP 2)</p>	<p>System will be customizable [core technology] “I kept saying to “the vendor” and to “system supplier”, you know, ‘we’re special but we’re not that special and what we are asking you for here in our view is actually legal - it’s legislative for us and therefore it must be legislative for everybody else’ and when you buy the “system supplier” system, it’s set up as a global worldwide system and you get it set up for the legislation in your part of the world..., but still they said ‘no that’s not how it’s built’ and I had difficulty with that on a personal level, because I thought well for goodness’ sake, you know, how on earth”. (National Project Team Respondent 1, A-CIP-OVCT 2)</p>
<p>Managerial normative => Core technology</p>	
<p>Variety of HR management practices that reflect RHOs diversity: “I would say that there was a degree of difficulty because you’ve got [large number of RHOs] with different systems currently in use. So to merge all the systems to a system that suits</p>	<p>System needs to be customizable to accommodate variety in RHOs practices [core technology]: “They had the specification and then obviously the system they bought was just an off the shelf system that they just put the basic package and then obviously they needed to customize it to meet with the needs of all the [RHOs]”. (HR Professionals, RHO</p>

<p><i>all the [RHOs] and all the processes and systems then I think the range now of the specification became quite wide". (HR Professionals, RHO 5, A-MNIP 3)</i></p>	<p>5, A-MNIP-OVCT 3)</p>
<p><i>Technical normative => Organizational practices</i></p>	
<p>Extensive consultative processes that characterize all processes within health organizations: <i>"That's the way we work in the [NHO], it's no different to this project. So at the end of the day we're very consultative...You can't buy a product and then insist that [all RHOs] will bring it in without any buy in and consultation. So no matter what you do, if you're bringing in a national project you need to get all your stakeholders to agree to it. So that's not a criticism you would expect there to be dialogue and consultation and engagement and people tied into it". (Senior HR Executive, RHO 2, A-TNIP 4)</i></p>	<p>Extensive consultative processes are needed to elicit requirements, and ensure the "buy in" into the system [<i>organizational practices</i>]: <i>"In writing the requirements we had gone out to the HR services across [the country] and invited people in in expert groups within various elements – recruitment, employee relations, you know, attendance and training – and we put these people in a group. So we had groups of what we call experts if you like. They formed what we called workflow groups. Now they were the experts that informed the requirement specifications for their areas so we knew exactly what it was that was needed. They also, and they still run today albeit in slightly different forms, they were also there to be the kind of expert users as we went through the conference room pilots, through into testing and so on and so forth. So if there's anything as a central team as we had here and we weren't sure what was needed, we would go and ask the expert groups to give us advice and guidance on this. And those groups, as I say, still run today". (National Project Respondent 2, A-TNIP-OVOP 4)</i></p>
<p><i>Mimetic => Business problematic & Organizational practices</i></p>	
<p>System supplier system was also procured in a neighborhood country: <i>"I think it was the "System Supplier" [HRIS]". (Senior</i></p>	<p>New system had to be HR lead, not Payroll led like in a NHO in a neighborhood country [<i>business problematic</i>]: <i>"The other issue was that we actually have a payroll system that works and is national and</i></p>

<p>Procurement Respondent, A-MIP 5.1)</p>	<p><i>if you were implementing a new system we'd actually get caught up in implementing the payroll part of it to ensure that people were paid and the HR part of it, which is the bit we really wanted, would be second-rate, and that's what happened in [a neighborhood country] ..., [but] they had a number of different payroll systems, which we didn't have, and so that led to us getting to the point of saying 'well look, let's get an HR system and link to payroll'.</i> (National Project Team Respondent 1, A-MIP-OVBP 5)</p>
<p>Used HRIS specification of a neighborhood country, but localized it according to the NHO requirements: <i>"So we then worked on a specification for the national HR system and what we did was we stole with pride the [other EU country] specification for their scheme and we worked on that and we tartanised that, we made it very [local]".</i> (National Project Team Respondent 1, A-MIP 5.2)</p>	<p><i>if you were implementing a new system we'd actually get caught up in implementing the payroll part of it to ensure that people were paid and the HR part of it, which is the bit we really wanted, would be second-rate, and that's what happened in [a neighborhood country] ..., [but] they had a number of different payroll systems, which we didn't have, and so that led to us getting to the point of saying 'well look, let's get an HR system and link to payroll'.</i> (National Project Team Respondent 1, A-MIP-OVBP 5)</p>
<p>Chosen vendor is a current managed technical service provider: <i>"The "vendor" already help support [NHO] systems, not all of them but some of them".</i> (Senior HR Executive, RHO 2, A-MIP 6)</p>	<p>Chosen vendor has experience of delivering IT projects for the NHO [organizational practices] <i>"They are the major providers for other clinical systems, it's not that they didn't have the experience of the difficulties of delivering something".</i> (National Project Team Respondent 1, A-MIP-OVOP 6)</p>
<p>Strategic response</p>	
<p>Compromise: <i>"Now if there's something that doesn't necessarily cost money but would impact other [RHOs], I've got to ask [them] I chair the deputy directors of HR for [NHO]. So I check with my colleagues, my deputy directors, any impacts it would have on their [RHOs]. I guess an example of that was there was an alert in the system for fixed term contracts. The alerts were set at 30 days – 90 days and then 30 days – and a couple of the [RHOs] had come to me saying that they would prefer it to sit at 120, then 30 days. So that had an impact. So I had to check with my colleagues a preference and I just went with the majority, which was now 120 and then 30 day alerts. So it's things like that, that I make sure that other [RHOs] understand the implications of changing these alerts".</i> (Senior HR Executive, RHO 1, A-SR 1)</p> <p><i>"We couldn't have [all] members in every single group so it was kind of the acceptable 8 or 10 people from that who were representative...Some [RHOs] did [participate], some didn't. I mean we have obviously [remote RHOs] and they can't afford to fly people down, you know, every month to meetings and things so they</i></p>	

couldn't really take part to the same extend''. (National Project Team Representative 2, A-SR 2).

The key demand shaping the project, from adoption and through to implementation and early assimilation was **coercive** pressure from the government to reduce costs in the public sector, particularly in healthcare (A-CIP 1). The respondents attributed these cost cutting demands to the post global financial crisis (2007-2008) public sector culture. These government demands for widespread cost-cutting significantly altered all the components of the organizing vision, including the business problematic that organizational actors associated with the new HRIS during the previous stage, the core technology, and the organizational practices surrounding the development of the system. The NHO had to diminish the original system specification dramatically, midway through procurement, due to budget cuts (A-CIP-OVBP/CT 1.1). Thus the organizing vision for the innovation had to be narrowed down significantly in comparison with the expectations formed during the previous stage. Essentially the technology package became limited to core functionalities, with all the “nice to have” HRIS functionalities being eliminated. The cost cutting pressures also forced the NHO into the highly unusual position of having to state the budget available for the new HRIS in the tender announcement and to shift from open to restricted procurement, which involved introducing a pre-qualification questionnaire that was supposed to save time both for the NHO and the applicants (A-CIP-OVOP 1.2).

Another coercive pressure was the national regulations on equality and diversity which required organizations to guarantee that all staff and candidates have equal opportunities and to eliminate any possibility of discrimination during recruitment

(A-CIP 2). This coercive pressure introduced further changes in the HRIS' emerging business problematic. Thus, for example, one of the key requirements arising from equal opportunities regulations was that during recruitment, candidates' sex and age data should be invisible to the recruiting manager. This application of the system required, contrary to the expectations formed during the previous stage, that the system be customisable to accommodate differences in regulations (A-CIP-OVCT 2). Critically, this expectation that system customisations should be possible in order to allow conformity to regulatory requirements introduced additional demands on the core technology to expand beyond the narrow specifications within the tight budget as demanded by coercive pressures for cost-cutting.

This innovation stage was also influenced by **managerial** and **technical normative** pressures. While at the previous stage, managerial normative pressure assumed a simplistic approach to improve the efficiency of personnel management through standardising processes and practices across the NHO, at this stage the normative demands for improving efficiencies were intertwined with the reality that the diversity in practices and structures in HR operations across individual RHOs were entrenched and any improvements would have to accommodate this diversity to some extent (A-MNIP 3). This change in the emphasis of the managerial normative demands from expectations of an application of the system that assumes standardisation in processes in the previous stage, to one that accommodates different practices, introduced further changes in expectations concerning the ability to customise the system during its application, and created additional demands for system specifications (A-MNIP-OVCT 3).

The increase in system specification to accommodate the requirements of individual RHOs contrasted with the demands for tight specifications that shaped the procurement of the system to ensure fit within a tight budget.

The **technical normative pressure** manifested in (often taken for granted) extensive consultative processes that characterize work procedures within the health sector, partially reflecting the wide diversity of specialisations and the need to involve and consult the variety of specialists within the broad decision-making process (A-TNIP 4). This technical normative demand for engagement and consultation across the spectrum of audiences involved with the system significantly shaped the organizational practices involved in adoption of the system particularly in matters concerning system specification creation. For example, during the initial system specification creation, a complex organizational arrangement of workgroups was set up to facilitate the consultation and involvement of a wide range of diverse professionals across most RHOs. The aim of these organizational arrangements to support consultation was not only to elicit requirements, but also to ensure the “buy-in” of these professionals into the system and facilitate its later assimilation (A-TNIP-OVOP 4).

Finally, the **mimetic** pressures present during the previous stage were also strongly manifested during the adoption stage of the HRIS innovation process. First, the demand to follow the example of the neighbouring country’s NHO might explain why, although NHO thoroughly considered various business case scenarios, the decision was made to procure the same off-the-shelf HR package as was acquired by the other country’s NHO (A-MIP 5.1). Similarly, the system specification of the HRIS procured in a neighbouring country was used as a

starting point (A-MIP 5.2). This mimetic demand to copy the neighbouring NHO shaped expectations surrounding the organizational application of the innovation that was largely developed through comparison with the approach taken by this other similar but much larger neighbour. A decision was taken to follow the neighbour's approach, while localizing the application of the system to meet the need of the studied NHO to have an HR-led system (contrary to the neighbouring NHO which had Payroll-led HRIS) that would be interfaced with the pre-existent national Payroll system, which was a solid and stable IS and thus in no need of replacement (A-MIP-OVBP 5).

Similarly, the experience of using the same technical service provider within a range of national clinical IS implementations, including workforce systems, within the NHO could be a potential factor explaining the adoption of the system from the same provider (A-MIP 6). The demand to follow similar projects with the same provider shaped the expectations of the NHO in terms of the organizational practices surrounding the adoption of the system. As the vendor had worked with the NHO before on a number of similarly large and complex projects, the expectation was that they would be familiar with the complexity and demands of IS adoption in the NHO and thus the adoption process would be relatively smooth (A-MIP-OVOP 6).

In conclusion, at this stage, the continuation of existing mimetic pressures and a change in the emphasis of normative institutional pressures from the previous stage, as well as the emergence of new coercive demands altered the emerging organizational vision of the organizational actors concerning the HRIS concerning the *business problematic* and also began to shape specific expectations regarding

the *core technology* and *organizational practices* involved in the adoption of the innovation. The scope of business application narrowed down, with the core technology being restricted on one hand to key functionalities to be achieved within a tight budget, while on the other hand specific functionalities were added. In terms of organizational practices, on one hand the procurement process was dramatically simplified to reflect the need for completion within the specified budget and narrow specifications, while on the other hand the development of system specifications was delayed due to engagement in extensive and wide consultative practices.

While at the previous stage the expectations of organizational actors were broadly cohesive, at this stage conflicts begin to emerge between the different expectations of organizational actors introducing conflicting expectations within the organizing visions. These conflicts included the tension between coercive pressures for cost-cutting and tight specifications on one hand, and regulatory demands and changes in the emphasis of the managerial normative demands to allow for customisation on the other. These inherent tensions became embedded in the emerging organizing vision of the HRIS, explaining the change in strategic response of the actors from one of acquiescence to one of compromise. The HR directors of individual RHOs who had originally supported and engaged with the system were now having to balance competing demands from different audiences: from government for cost-cutting and limited funding within tight specifications, from NHO pressures for engagement in wide consultative processes to clarify system specification and to impose internal normative demands for efficient management through customising the system so that the agreed specifications

reflected their internal requirements. The compromise strategy reflected the efforts of RHOs to reconcile these different expectations surrounding the organizational application of the innovation as well as the organizational practices involved in adopting the innovation (A-SR 1).

Similarly to the RHOs, the national project team also engaged in compromise to deal with the conflicting expectations embedded in the vision for the system. Thus, for example, they responded only partially to the technical normative demand for extensive consultative processes, as they did not involve representatives of all RHOs, nor all potential future system user groups, in the work on the core system specification. Instead, the focus was on seeking agreement within strong resource constraints where a compromise - fair rather than full participation - was sought (A-SR 2).

7.2.3 Innovation Stage 2: Implementation

Different institutional pressures affected system implementation including data migration, system configuration and testing and the shaping of both the core technology and the organizational practices of the emerging organizing vision. Some of these pressures emerged at the previous HRIS innovation stages, but their influence on organization vision changed during this stage (Table 14).

Table 14. Implementation (national case). Data structure & exemplary quotes

Institutional Pressures	Organizing Vision
<i>Coercive => Organizational practices & Core technology</i>	
Pressure on public sector and NHO to reduce spending: <i>"We had nowhere near</i>	Small central team will be able to manage all central implementation activities [<i>organizational practices</i>]:

<p><i>[needed amount]. I mean miles away from it. We're at the other end of the scale from that". (National Project Team Respondent 2, I-CIP 1)</i></p>	<p><i>"So that immediately, when people said 'right, well how can we get this system when we've only got that amount of money? What are we going to cut off?' and it was things like the national project team cut it right down to the bare bones". (National Project Team Respondent 2, I-CIP-OVOP 1.1)</i></p>
	<p>RHOs would be fully responsible for all local implementation activities and dedicate resources needed to manage them [organizational practices]:</p> <p><i>"They also said 'well, rather than the national team be responsible for the implementation locally in the [RHOs] in the same way, the [RHOs] will take that responsibility' and the [RHOs] signed up and they said 'yeah, we'll take that, we'll do that, we'll set up the teams locally' and so on and so forth". (National Project Team Respondent 2, I-CIP-OVOP 1.2)</i></p>
	<p>Local implementation teams included mostly HR professionals, who were expected to manage the project in addition to their full-time jobs [organizational practices]:</p> <p><i>"I am wanting...try and bring on one of our other workforce-information people. But they already have full workloads, so it's going to be a case of just trying to juggle and prioritise some of the things. I have no resource to do this work on – you know, on a – what do you call it? Protected basis". (Senior HR Executive, RHO 4, I-CIP-OVOP 1.3)</i></p>
<p>Data protection law: <i>"[Team of Developers] don't have access to any employee data". (Key Project Participant, Vendor, I-CIP 2)</i></p>	<p>System testing with the dummy data will be sufficient [core technology]:</p> <p><i>"You test it all, raise any difficulties you've got with your data, not real data clearly but dummy data, to work through and you check it all out. Once you're happy with it all, you sign it off and the system's good to go". (National Project Team Respondent 1, I-CIP-OVOP 2)</i></p>
<p>Managerial normative => Organizational Practices</p>	

<p>Variety of HR management practices adopted to reflect the diversity within RHOs: <i>“Some [RHOs] have got live data in but some of the data, sets are very small so for our data, you know, our data’s the equivalent of three or four other RHOs all at one time, so it’s got to be spot on for us”.</i> (Senior HR Executive, RHO 2, I-MNIP 3.1)</p>	<p>Changing expectations about the simplicity and duration of the new HRIS implementation process (e.g. transition involved in data migration) [organizational practices]: <i>“I would say [it] took probably longer than we would have envisaged”.</i> (National Project Team Respondent 3, I-MNIP-OVOP 3).</p>
<p>Many organizational changes within the NHO: <i>“As organizations have changed over the years therefore the changed departments, the changed titles, so folks have got lots of information against them that may be different now so, you know, you might have called it Department A before. It’s now Department D with lots of sub groups and that and that’s information that’s against an employee so it’s the complexity and some of that information is oh you have to decide are you going to keep it like that or are you going to modify it so that it’s the new information, the old information’s now not required? But you generally can’t -, it’s not that you can delete or anything like that, you kind of have to amend it to the new”.</i> (eHealth</p>	

Respondent, I-MNIP 3.2)	
<i>Technical normative => Business problematic</i>	
<p>Focus in health organizations is on clinical eHealth projects:</p> <p><i>“More investment, understandably, is placed on the clinical systems...and I think, bearing in mind that [the new HRIS] isn’t progressing very quickly across [NHO], perhaps it hadn’t been prioritized against clinical systems that are needed now”.</i> (Senior HR Executive, RHO 4, I-TNIP 4)</p>	<p>The vision was tried to be created that the new system is generic management system [business problematic]:</p> <p><i>“We keep promoting the fact that [new system] is not an HR system; that it’s actually a management system”.</i> (Senior HR Executive, RHO 4, I-TNIP-OVBP 4)</p>
<i>Mimetic => Organizational practices and Business problematic</i>	
<p>Challenging HRIS implementation among early adopters:</p> <p><i>“I went out to see a few people and said ‘look, why aren’t you using it, what is wrong with the system, what’s the problem’ and what came back was ‘we don’t really have a lot of confidence because nobody’s using it”.</i> (National Project Team Respondent 1, I-MIP</p>	<p>RHOs started forming a negative image for the new HRIS [organizational practices]:</p> <p><i>“And when the people at the bottom are saying, ‘Oh, it doesn’t work’, that goes up the chain; they then come to meetings and go, ‘Well, I’ve been told it doesn’t work.’ And you’re going, ‘But why?’ and they’re going, ‘Well, I’ve been told it doesn’t work.’ But the damage is done, because they sit in a meeting saying, ‘It doesn’t do this.’ And even if you say, ‘Er, stop a minute. It does actually do that’, all the people round the table have heard is ‘it doesn’t do that”.</i> (National Project Respondent 2, I-MIP-OVOP 5.1)</p>

5).	<p>Most RHOs with pre-existent HRIS decided to continue using their pre-existent systems until all functionality and technical issues with the new HRIS will be resolved [<i>core technology</i>]:</p> <p><i>“And then we’ll be able to test that we can keep the system up to date, and then the plan would be, that would allow us, assuming that the system is deemed to be completely fit for purpose, to start to roll it out to managers. And then, stop our [pre-existent HRIS] contract at a point in time where we’ve got the system rolled out”.</i> (Senior HR Executive, RHO 8, I-MIP-OVBP 5.2)</p>
Strategic Responses	
<p>Acquiescence: <i>“Originally we were in phase three but then we moved to phase two... We felt we were ready because things appeared to be going well... So we were happy to do it at the time”.</i> (HR Professionals, RHO 5, I-SR 1)</p> <p>Avoidance: <i>“There are three [RHOs] as I said who haven’t yet migrated now. They’re basically sticking with the payroll interface and because the payroll interface isn’t going to be delivered till October they’ve now delayed until kind of May/June next year”.</i> (National Project Team Respondent 2, I-SR 2)</p> <p>Defiance: <i>“It was going to be four [RHOs] but [one RHO] dropped out because they felt that their own system, they had their own system at the time, gave them what they needed. They felt the risk of moving to the new system, given the difficulties and the extra time they’d taken, wasn’t going to immediately take over from that system, there were going to be some gaps between them. So they asked to move to a later phase so we kind of rolled out with three [RHOs]”.</i> (National Project Team Respondent 2, I-SR 3)</p> <p>Compromise: <i>“Now most of the [RHOs] have migrated the data. None of them are rolling out fully... but there are some pockets... departments within small areas, pilot groups really often”.</i> (National Project Team Respondent 2, I-SR 4)</p> <p>Manipulation: <i>“And back last summer, there was a view that it just felt we were treading water with this whole process. We weren’t getting to the stage where it was getting rolled out across the [NHO] and used effectively. And we were saying, ‘yeah, well, we’re having similar problems.’ There were just so many bits and pieces that needed to be looked at, and somebody needed to focus on working through these things. So what [central project team] agreed last summer was that it would be useful if we could get three [RHOs] who would look at the system and try and get it working end-to-end within their [RHOs]”.</i> (Senior HR Executive, RHO 8, I-SR 5)</p>	

The **coercive** pressure for reducing NHO's spending continued from the previous stages, but its influence at this stage was primarily on the organizational practices surrounding IS implementation (I-CIP 1). Cost-cutting pressures created the expectation that the entire implementation process would be coordinated centrally by a relatively small team, "cut to the bare bones", with the actual implementation being delegated to the local RHOs (I-CIP-OVOP 1.1). These local RHO-based implementation teams were expected to be fully responsible for and able to dedicate resources to all local implementation activities (I-CIP-OVOP 1.2). Thus the local implementation project teams included HR professionals, with the system being labelled an HR system, despite the fact that it was supposed to be used by every employee in NHO. Moreover, due to cost-cutting pressures, no additional staff were brought in by most of the RHOs, so the local HR teams were expected to manage the project in addition to their full-time jobs (I-CIP-OVOP 1.3).

A further coercive pressure that continued to shape the innovation during the implementation stage was the regulatory demand for data protection (I-CIP 2). At this point, data protection demands shaped expectations around the core technology of the innovation by preventing system developers' from accessing NHO employees' data, thus forcing the national project team and the vendor to seek alternative technical solutions to respond to this demand. The approach involved testing the system with dummy rather than real data to ensure the system complied with the regulatory demands (I-CIP-OVOP 2).

Normative pressures present at previous stages continued during implementation. **Managerial normative** pressures related to the diversity of HR structure,

processes and practices across individual RHOs continued to influence the innovation during data migration at the implementation stage (I-MNIP 3.1). Associated with managerial normative expectations is also a tradition of continuous organizational changes to seek efficiency improvements through streamlining existent organizational processes across the RHOs, and this has also shaped the implementation of HRIS project (I-MNIP 3.2). Continuous organizational changes led to amendments in some of the employee information (e.g. changes to job titles) during the system implementation, introducing added complexity by creating decision points about what information was important to transfer and what was not. These expectations of continuous organizational changes coupled with demands to account for diversity in RHO practices played a critical role in changing the expectations of organizational actors concerning the ease with which the envisaged core application of the IS innovation could be achieved. For example, diversity in HR practices meant diversity in the employee data that individual RHOs collected and stored, and which had to be migrated to the new system. This diversity led to the realization that the expected quick transition to the new system was unrealistic, and instead began to be perceived as a long, difficult and protracted process (I-MNIP-OVOP 3). These decisions concerning the relevance of RHOs' is an example of the complexity of organizational practices characterizing the implementation of the innovation.

Normative technical pressure for prioritising effort in clinical IS innovations that are perceived as supporting directly the ability to deliver high quality care to patients emerged during the implementation stage to further hamper the implementation process (I-TNIP 4). These technical norms influenced the

expectations that actors had about the importance of the business problematic, and consequently about prioritization for funding. Many of the respondents reported that the focus on clinical IS innovations was at least partially responsible for the limited resources available for the delivery of the HRIS project within individual RHOs, thus further slowing down system implementation (I-TNIP-OVBP 4).

The project implementation was also challenged by **mimetic** pressure, as later RHO adopters were following early HRIS RHO adopters. The early adopters were confronted with significant technical and functionality issues, mostly having to do with the conflict between the tight specification envisaged due to cost pressures and the need for extensive customisation to deal with specific practices as well as broader regulations. Technical problems also hampered the early implementation as the system with the procured tight specification was clearly not providing the range of functionalities that were envisaged originally. Consequently, informed by the early adopters of the system, later RHO adopters began to either postpone their local implementation activities or in extreme cases even withdraw from them. (I-MIP 5) This mimetic behaviour quickly spread across other RHOs, thus placing at risk the complete delivery of this national project and realizations of its benefits. These mimetic pressures propagated a negative set of expectations around the organizing vision both in terms of the usefulness of its organizational application and the functionality of the core technology (I-MIP-OVOP 5.1). As expectations deteriorated, most RHOs with pre-existent HRIS decided to continue to use their existing systems until the functionality and technical issues of the innovation were resolved (I-MIP-OVBP 5.2).

In conclusion, the institutional tensions that emerged during the adoption stage were amplified at the implementation stage leading to significant shifts in the expectations of the organizational actors surrounding organizational practices, core technology and the business problematic of the new HRIS. Organizing practices were associated with the expectations for a nimble and technically relatively straightforward implementation: central coordination by a small central team, with implementation activities delegated to local teams' led by HR professionals, often with no additional resources supplied. In contrast, the reality of the context of application introduced huge complexity in the innovation in terms of both application and core technology, for example in terms of technical difficulties, the need to accommodate varied processes and structures and changes in data. Thus during the implementation stage, conflicts between elements of the organizing vision accentuated: while organizational practices reflected the original expectations for an off-the-shelf product, the organizational application was moving towards a customised system to respond to differences in practices and demands, and the core technology struggled to fulfil all business expectations within the tight budget imposed by cost cutting pressures.

To deal with the increasing tensions within the expectations embedded in the vision, RHOs engaged in a range of different responses. In the early stages of the implementation when the tensions were not yet strongly apparent, several RHOs (especially small RHOs without pre-existent HRIS) decided to speed up their *acquiescence* to institutional pressures to adopt the new HRIS, and asked to move faster with implementation (I-SR 1).

As tensions within the organization vision became apparent, the variety in RHOs' responses increased. Some RHOs displayed an *avoidance* response by choosing not to engage in the implementation activities as per the planned schedule, instead deciding to wait until the system was implemented by other RHOs to demonstrate that it was functional and fit for purpose (I-SR 2).

Other RHOs adopted a *defiance* strategy and actively withdrew from their unfinished implementation activities, in some cases after making massive investments in data migration to the new system (I-SR 3). These defiant RHOs argued that the HRIS was not fit for purpose and asked the national implementation team to demonstrate that the new system was fully functioning and fit for the purpose as a condition of re-engaging with the implementation process.

Those RHOs which proceeded with their implementation activities adopted a compromise strategy seeking to negotiate and pacify both their external (NHOs) and internal (HR, ICT) audiences (I-SR 4). These compromising RHOs either:

- Asked for many configurations/customizations so that the system would be able to accommodate most of their pre-existent HR practices;
- Adopted the new system either only within their HR departments, small pilot groups outside of HR and/or made utilization outside of HR voluntary; and/or
- Implemented only some module/s of the new system that they were happy with, while continuing to use their previous approach for other modules (e.g. they relied on a particular module of their existing system, leading to widespread replication of work in these RHOs, in particular double data

entry, while also paying for two systems for those RHOs with pre-existent HRIS).

As the organizing vision was marred by mounting tensions, negative expectations building up and the project being stalled, and with coercive pressure for adoption increasing, *defiance* and *avoidance* were difficult to maintain and *compromise* did not manage to achieve much success in pacifying divergent demands. In an effort to resolve the conflict and generate some consensus around a new vision of what the innovation should and could be, a number of RHOs adopted a *manipulating* strategy in attempting to change the original institutional expectations around the system (I-SR 5). They requested the central implementation team to conduct a pilot to produce evidence that would identify which parts of the system were fit for purpose and which not, and to generate a list of best practices on system implementation and usage. In an attempt to solve the conflict and move forward the vision around the innovation, this request was accommodated by the central team which launched a pilot to test the system in three RHOs willing to engage with the pilot. The pilot was assessed by an external consultancy organization (impartial to the demands and expectations that characterised the project and thus trusted by both RHOs and NHO) which produced the evaluation report.

Visual representation of the processes through which organizational actors responded to perceived institutional pressures, interpreted the nature and goals of the innovation itself and its deployment within the organization, and changed their responses over time is presented in the Figure 9.

Figure 9. Visual representation of the conceptual framework (national case)

	Comprehension	Adoption	Implementation
Coercive pressure	Health workforce data*; HR shared services*; Digital integration agenda*; Data protection law	Reduce spending; Regulation on equality and diversity	Reduce spending; Data protection law
Organizing vision	BP	BP CT OP	OP CT
Normative (Managerial) pressure	Variety of HR management practices; Efficient workforce planning and management*; Reduction of administrative work for HR professionals*	Variety of HR management practices	Variety of HR management practices; Many organizational changes
Organizing vision	BP	CT	OP
Normative (Technical) pressure	Monitoring statutory registrations of medical professionals*; Skilled workforce and capacity to deliver high quality care*	Extensive consultative processes	Focus on clinical eHealth projects
Organizing vision	BP	OP	BP
Mimetic pressure	Similar projects in the neighboring NHO; Similar projects in other large organizations; Similar IT projects in the NHO	Same HRIS procured in the neighboring NHO; HRIS specification of a neighboring NHO; Existing NHO IT vendor	Challenging implementation among early adopters
Organizing vision	BP	BP OP	OP BP
Strategic Responses	Acquiescence	Compromise	Acquiescence, Avoidance, Defiance, Compromise, Manipulation

BP=Business Problematic; CT=Core Technology; OP=Organizational Practices

* Intention to adopt pressures continuing their influence throughout the project life cycle

↔ Conflicting organizing visions

7.2.4 Post (project) scriptum

At the time of the data collection the outcomes of the pilot were discussed at the central level jointly by HR Directors of all RHOs, central implementation team, governmental and vendor representatives. The outcomes of these discussions supposed to include important decisions on how to make this new HRIS work for the NHO and all its RHOs. It was advised by most of the respondents that there was a clear understanding that the system implementation will continue primarily due to the large financial investment already made. Therefore, the expected future steps included finding a resolution to the technical and functionality issues with HRIS identified during the pilot, and abandoning the areas which were found to be most problematic including:

- Its recruitment module, where a likely alternative was to continue using recruitment modules of the pre-existing HRIS which were implemented in some of the RHOs; and
- The interface between the new HRIS and the pre-existent national payroll system, where a likely alternative was to continue trying to interface these two systems or to implement the payroll module of the new HRIS.

7.3 Regional case study in Country 2

7.3.1 Innovation Stage 1: Comprehension/Intention to adopt

Normative (both clinical and managerial) and mimetic pressures influenced the RHO's intention to adopt the HRIS. Each of these two forms of pressure generated particular expectations among the relevant actors concerning the organizational issues that the new system was supposed to address, contributing to

a cohesive business problematic within the organizational community (see Table 15).

Table 15. Comprehension (regional case). Data structure & exemplary quotes

Institutional Pressures	Organizing vision
<i>Managerial normative => Business problematic</i>	
<p>RHOs intention to obtain EFQM certification:</p> <p><i>“In quest’ambito del personale [for certification] come è normale, vennero fuori diversi elementi di miglioramento. Infatti la dimensione del personale era quella che in quell’assessment venne come un po’, rispetto agli standard proposti da EFQM, quella che venne adottata come un po’ più debole e carente”.</i> (Administrative IS team respondents 1&2, C-MNIP 1.1)</p>	<p>HRIS can support required organizational change (including transformation of HR department)</p> <p>[business problematic]:</p> <p><i>“Primo assolutamente la necessità condivisa da tutti di avere un sistema informatico che supportasse tutta questa partita, perché noi prima come tutte le aziende pubbliche avevamo, abbiamo tuttora dei sistemi, ma sono dei sistemi che garantiscono la parte burocratico-amministrativa. Quindi naturalmente timbrature, le buste paghe, gli stipendi, tutto quello che ha a che fare con la normativa. Ma tutto quello che è gestione vera delle competenze, diciamo così, ha bisogno di uno strumento ad hoc, cioè costruito perché [new HRIS] possa supportare tutto questo”.</i> (Care processes governance team respondent, C-MNIP-OVBP 1)</p>
<p>Management of the RHO should not be focused only on clinical, but also on managerial activities (which was also reflected in the RHOs strategic plan):</p> <p><i>“Un po’ per diversi motivi, per ribilanciare un po’ gli sforzi, per non far sì che l’organizzazione di fatto insistesse solo in una determinata area, per dare anche un segnale che il management non è che sia solo orientato alla parte solo clinica professionale, per quanto sicuramente potrei dire quella più importante sotto certi aspetti per la nostra missione. Quindi tanti elementi un po’ oggettivi, un po’ anche discrezionali e soggettivi che hanno portato all’urgenza, si far per dire, tra virgolette, di lanciare un progetto”.</i> (Administrative IS team respondents 1&2, C-MNIP 1.2)</p>	
<p>Focus on administrative HR practices and low employee satisfaction with the services</p>	

<p>that HR department provided:</p> <p><i>“Non c’era un modello organizzativo e quindi sotto non c’era un modello di ruoli, un sistema di ruoli per cui si dice “ok questo ruolo è più complesso di quest’altro o dal punto di vista specialistico o da un punto di vista manageriale”. L’altro elemento era sostanzialmente che non c’era nessuna attenzione specifica allo sviluppo delle persone perché tanto tutte le promozioni vengono fatte tramite concorso... E le persone quindi non le seguono da un punto di vista di sviluppo, di carriera, di sviluppo della professionalità perché dipende da loro e dipende dal concorso”.</i> (External consultant, C-MNIP 1.3)</p>	
<p>Reduce amount of administrative work for HR professionals:</p> <p><i>“Allora l’obiettivo di questo progetto era anche togliere delle attività che prima facevano magari a mano o sull’Excel in modo da poterli investire su altre attività a più valore aggiunto”.</i> (Administrative IS team respondent 2, C-MNIP 2)</p>	<p>Managers and employees will become responsible for some HR processes [business problematic]:</p> <p><i>“Sì, magari sui processi proprio cercare di rendere più efficienti alcuni processi. Quindi delegando maggiormente sia ai dipendenti sia ai responsabili. Questo è un po’ proprio un principio di tutti i nostri applicativi nella parte di HR manager, il fatto di fare empowerment delle persone, quindi attraverso processi sempre più self-service nei quali l’HR tiene solo un ruolo di linea guida. Ma poi tutti i processi avvengono in modo più efficiente, più semplice all’interno dell’organizzazione. Magari questo potrebbe essere un passo per il futuro”.</i> (System supplier key project participant, C-MNIP-OVBP 2)</p>
<p>Variety of HR management practices that</p>	<p>New HRIS should be able to</p>

<p>reflect diversity within RHO and diversity of professional staff that RHO employs: <i>“I fattori organizzati che secondo me hanno determinato l’implementazione, quindi le esigenze che hanno determinato l’implementazione di questo progetto, sono stati il fatto di avere processi diversi sul personale, gestiti con sistemi molto diversi, sono dei sistemi frammentati”.</i> (Administrative IS team respondent 2, C-MNIP 3)</p>	<p>support and accommodate this diversity [business problematic]: <i>“Quindi serviva un unico software che raccogliesse tutte queste informazioni insieme, per poi riuscire a fare anche un fascicolo individuale per ciascun dipendente”.</i> (Administrative IS team respondent 2, C-MNIP-OVBP 3)</p>
<p><i>Technical normative => Organizational practices</i></p>	
<p>Extensive consultative processes that characterize all processes within health organizations: <i>“E quindi il primo lavoro che è stato fatto è stata fatta un’analisi di alto livello sullo stato dell’arte, intervistando una serie di stakeholders, il direttore del personale, direttore generale, direttore sanitario, direttore amministrativo e alcune persone della direzione del personale etc. per capire quale era lo stato dell’arte, la situazione di partenza. Poi per l’analisi dei processi e la definizione dei requisiti abbiamo fatto, abbiamo intervistato tutte le persone coinvolte dell’HR, coinvolte, e abbiamo fatto dei comitati con alcuni clienti interni rappresentanti della linea.”</i> (System supplier key project participant, C-TNIP 4)</p>	<p>Extensive consultative processes are needed to understand in detail how the pre-existent processes work [organizational practices]: <i>“Allora, diciamo che forse noi alla luce di questa esperienza abbiamo speso troppo tempo per fare l’analisi dell’as is, nel senso che abbiamo disegnato tutti i processi abbastanza in dettaglio da come erano. E questo è stato difficile perché le persone erano molto competenti del loro pezzo, molto analitiche, andando molto in dettaglio, correggendo tutti i dettagli possibili e immaginabili perché l’approccio era un approccio burocratico. Quindi chiaramente abbiamo fatto un bellissimo disegno dell’as is, per quello che ci riguarda spendendo una volta e mezza quasi due quello che avevamo disponibile come budget. E quindi abbiamo fatto proprio un bagno di sangue perché essendo una gara il budget era fisso, non è che potevamo fare delle varianti. Ma la cosa più importante</i></p>

	<p>è che tendenzialmente il nostro lavoro non serviva”. (External consultant, C-TNIP-OVOP 4)</p>
<p>Focus in health organizations is on clinical eHealth projects:</p> <p>“C’era un direttore generale, un CEO che credeva in questo tipo di sviluppo [in administrative IS] e che quindi con lui è stato possibile assicurare questo budget. Secondo me in tempi più recenti, con altri CEO non ci sarebbe stata molta chance di assicurare il budget richiesto, perché è un’operazione comunque a 3 anni. Cioè vuol dire mettere lì comunque qualche milione di euro per fare un progetto [for administrative IS], magari non tantissimi, però un progetto di questo tipo. E quindi tra i servizi, software, il post implementation così, secondo me sui sistemi gestionali, quindi non clinici, non sanitari, da allora un investimento così importante non è più stato fatto”.</p> <p>(Administrative IS team respondents, C-TNIP 5)</p>	<p>RHO started the new HRIS project only after all major clinical projects were completed [organizational practices]:</p> <p>“Certo, certo, questo senza dubbio. Infatti [RHO] è arrivata a fare questo progetto dopo aver fatto degli importanti progetti in ambito clinico, non prima”. (System supplier key project participant, C-TNIP-OVOP 5)</p>
<p>Mimetic => Core technology</p>	
<p>Similar ongoing HR transformation and HRIS projects in other large organizations:</p> <p>“Un po’ un check dei servizi del personale e un po’ di confronto anche con un po’ l’esterno, inteso come quali sono le principali tendenze evolutive, che cosa vuol dire una moderna organizzazione del personale e via dicendo”. (Administrative IS team respondents, C-MIP 6)</p>	<p>High expectations from the new system [core technology]:</p> <p>“Uno forse si crea delle aspettative che forse sono anche poco obiettivamente corrispondenti alla possibilità e ci si trova di fronte comunque un sistema che è quello che è. Quello che abbiamo detto finora. Cioè, per carità prima non avevamo nulla, adesso abbiamo questa grande cosa, siamo tutti felici, siamo tutti contenti però c’è comunque una certa macchinosità. Ci sono dei limiti. Comunque quello che abbiamo detto prima non è il</p>

	<p>sistema, scusi uso questa parola, non è il sistema intelligente. No. Ecco, e quindi questo un po' è quello che non ci saremmo aspettati forse, perché avevamo delle aspettative anche molto elevate". (Care processes governance team respondent, C-MIP-OVCT 6)</p>
<p>Strategic response</p>	
<p><i>Acquiescence: "Ok, allora, sostanzialmente tutto nasce da un piano triennale 2007 di [RHO], in cui si definivano una serie di obiettivi, di evoluzioni, richieste necessarie nell'azienda, da un punto di vista di business, di servizi, di servizi sanitari, sociosanitari, di organizzazione etc. Questa nuova evoluzione, questa nuova strategia richiedeva all'interno di questo documento, si faceva particolare menzione della necessità di lavorare anche sulle risorse umane, intesa come motivazione, competenze, per ruoli e managerialità nelle managerial skills e leadership skills diffuse. E quindi questo documento sulla carta diceva che c'erano delle cose da fare nuove, diverse e che bisognava anche pensare di lavorare sulle risorse interne per dare loro la possibilità e le competenze per poter affrontare queste sfide. Da questo appunto è nata l'idea di, la necessità di fare un progetto che, non solo guardasse, che potesse guardare a questi aspetti, quindi al modo in cui [RHO] potesse affrontare e sostenere una crescita, uno sviluppo delle risorse umane coerente con la nuova strategia. Questo da un punto di vista di contenuti. Da un punto di vista di persone sicuramente la volontà, cioè la vision del direttore generale e del comitato strategico che ha appunto definito prima sulla carta con quel documento e poi nei fatti la necessità di lavorare anche sulle risorse umane". (External consultant, C-SR 1)</i></p>	

Analysis of the data did not provide any evidence that the comprehension (intention to adopt) stage was affected by **coercive pressures**. Rather, the intention to adopt was primarily influenced by strong **normative pressures**, both managerial and technical. **Managerial normative pressures** manifested primarily in the form of the RHO's aim to obtain EFQM certification (C-MNIP 1.1). This required the RHO to improve not only their clinical, but also various administrative processes (C-MNIP 1.2), including those of their HR department, which previously focused only on administrative HR services that RHO had to

perform to comply with national and provincial labour legislation (e.g. payroll or monitoring employee attendance) (C-MNIP 1.3). Thus, for example, RHO's internal survey conducted for the EFQM certification revealed very low employee satisfaction with the services that their HR department provided. This prompted RHO to launch a comprehensive organizational change initiative, which was supposed to transform their administrative HR department into one with a strategic function performing not only HR activities required by legislation, but also transparent and objective HRM practices (e.g. performance management). The organizing vision that was created in response to these normative managerial pressures was that the new HRIS would support this organizational change by enabling the launch of more strategic, managerial practices (C-MNIP-OVBP 1).

Another *normative managerial pressure* that influenced the intention to adopt stage concerned the manual, administrative and routine processes that characterized RHO's HR department (C-MNIP 2). To reduce the amount of this administrative work for HR professionals, it was envisaged that the application of the system would involve making data made available to managers to help them manage their teams better, and allow administrators and employees to take responsibility for certain tasks previously not available or performed only by or with the help of HR professionals (C-MNIP-OVBP 2).

A final *normative managerial pressure* manifested as the need to maintain oversight of the vast diversity of sometimes fragmented processes and practices characterising RHO's HR operations, and a vision for improved efficiency through their rationalization and standardisation (C-MNIP 3). However, the RHO is a large and complex organization that employs a wide variety of geographically

dispersed professionals, who are considered their biggest asset. As such it has diverse HR processes that are adopted to manage these staff. Thus, despite the influence of the normative pressures for standardisation, the organizing vision was created in such a way that the system would be able to accommodate and support this diversity (C-MNIP-OVBP 3).

The *technical normative pressure* manifested in (often taken for granted) extensive consultative processes that characterize work procedures within the health sector, partially reflecting the wide diversity of specialisations and the need to involve and consult the variety of specialists within the broad decision-making process (A-TNIP 4). For example, numerous stakeholders across the RHO were interviewed by the project group and external consultant in order to design “as is” and “to be” HR processes. The aim of this exercise was primarily to understand pre-existing HR processes (C-TNIP-OVOP 4), although this was identified as an unnecessary step after the completion of this HRIS implementation.

Another *normative technical pressure* that affected this innovation stage was associated with the prioritization of effort on clinical IS innovations that are perceived to be more directly involved in delivering high quality care to patients. (I-TNIP 4) Thus the data suggest that the HRIS initiative was launched only after all major clinical IS projects were completed (C-TNIP-OVOP 5).

Finally, the project was also driven by **mimetic** pressures. At this innovation stage it was shaped by the example of other large scale organizations from different industries which, driven by the need to maintain their competitiveness, already had or were in the process of implementing the same organization-wide HRIS (C-MIP 6). This monitoring of similarly large scale HRIS initiatives in or outside

health sector created an expectation that this HRIS, very successful in other complex organizations (C-MIP-OVCT 6), would continue to be successful.

In summary, at this stage, strong normative (both managerial and technical) and mimetic demands shaped the expectations of the actors and their understanding of the HRIS innovation that was to be procured. At this stage the expectations focused on all three components of the organizing vision:

- **Business problematic:** the HRIS was envisaged to support necessary organizational change, accommodate the diversity within the RHO and the professional staff it employs, and empower managers and employees to become responsible for some of the HRM practices that were previously not existent or performed by or with the help of HR professionals.
- **Organizational practices:** (often taken for granted) extensive consultative processes and the focus in health organizations on clinical IS projects.
- **Core technology:** very high expectations of the new HRIS due to the strong reputation of the system supplier, and its implementation in other large scale organizations.

There were, however, Although there were some inherent contradictions between these components. For example, between the focus of health organizations on clinical staff and clinical IS projects (organizational practices), and the newly created vision for the application of the new HRIS that would require clinical staff (both managers and employees) to take responsibility for some of the pre-existent and new HRM practices (business problematic) that were performed previously with or by HR professionals. The confluence of strong institutional demands and the expectations of the community of actors which were aligned at this stage

around the range of organizational issues that the innovation would address caused an *acquiescence* response from stakeholders within the RHO (although my respondents did not include system end users who could express their point of view on the project) (C-SR 1).

7.3.2 Innovation Stage 2: Adoption

Coercive, normative and mimetic institutional pressures manifested during the adoption stage, creating noteworthy changes in the business problematic related to the emerging vision around the new HRIS, and determining expectations of the core technology and the organizational practices involved in the adoption and implementation of the system (see Table 16).

Table 16. Adoption (regional case). Data structure & exemplary quotes

Institutional Pressures	Organizing Vision
<i>Coercive => Business problematic & Core technology</i>	
Fixed project budget: <i>“Quindi abbiamo fatto un bellissimo disegno dell’as is, per quello che ci riguarda spendendo una volta e mezza quasi due quello che avevamo disponibile come budget. E quindi abbiamo fatto proprio un bagno di sangue perché essendo una gara il budget era fisso, non è che potevamo fare delle varianti”.</i> (External consultant, A-CIP 1)	The project had to be operated within the budget [<i>business problematic</i>]: <i>“Vabbè comunque, noi abbiamo operato questo progetto secondo un budget che era stato un Cap, cioè a non eccedere”.</i> (Administrative IS team respondents 1&2, A-CIP-OVBP 1)
Regulation on recruitment: <i>“Questo è un documento pubblico. Per cui, come dire, se uno alla</i>	System will be customizable [<i>core technology</i>]: <i>“È un continuo. Anche perché sono</i>

<p><i>fine, c'è una decisione di assumere o non assumere e a volte si gioca su dei punti percentuali. E allora se il sistema sbaglia giustamente le persone possono mettere in discussione. Quindi deve essere proprio molto preciso, no?"</i> (Administrative IS team respondent 1, A-CIP 2)</p>	<p><i>cose sulle quali bisogna essere sicuri al 150 % sennò poi fanno ricorso, quindi è sotto controllo praticamente ogni volta che c'è un concorso le persone stanno attentissime che questa graduatoria risponda, che [new HRIS] risponda ai criteri impostati".</i> (Administrative IS team respondent 1, A-CIP-OVCT 2)</p>
<p>Some employment regulations can cause legal outcomes: <i>"Immagino che quelli molto contestualizzati, molto normatizzati, che hanno dei vincoli normativi molto forti, non sono state inseriti".</i> (Administrative IS team respondent 2, A-CIP 3)</p>	<p>Processes that can cause any legal outcomes were not inserted into the new system [core technology]: <i>"Si è scelto di inserire quello sulle valutazioni, sullo sviluppo delle competenze, tutta la parte che inserisce il concetto di modello delle competenze, quindi la persona in un determinato ruolo con le determinate competenze. OK? Poi piano piano, questa è la partenza. Poi sono stati inseriti anche dei moduli nuovi, come ad esempio, la mobilità, la richiesta di part time, OK? Ci si allarga anche sulla parte gestionale. È stato scelto invece appunto il Payroll, la timbratura di lasciarlo fuori. Ed anche il modulo della formazione alla fine non è stato inserito all'interno di [new HRIS]".</i> (Administrative IS team respondent 2, A-CIP-OVCT 3)</p>
<p><i>Managerial normative => Business problematic, Organizational practices & Core technology</i></p>	
<p>Variety of HRM practices adopted to reflect the diversity of professional staff within the RHO: <i>"Una volta definite le strutture, ho</i></p>	<p>New HRIS will be able to accommodate this diversity [core technology]: <i>"Il sistema mi deve permettere di</i></p>

<p><i>bisogni di capire quali sono i ruoli all'interno delle strutture. Quindi un'unità operativa che cosa ha? Il medico, il caposala, il primario, ok. Tutti questi ruoli quali sono? Alcuni ruoli possiamo organizzarli in insiemi di ruoli che sono le famiglie professionali. Tutti i coordinatori infermieristici fanno parte della famiglia professionale dei coordinatori. Poi c'è il coordinatore della medicina, il coordinatore della pediatria. Quello è un ruolo OK? I ruoli però non è la stessa cosa di dire posizioni. Perché il ruolo ti definisce le competenze richieste dall'azienda. OK? Tu devi fare il coordinatore, tu devi fare il medico neonatologo. Ma a seconda di dove sono, posso aggiungere altre competenze che sono specifiche di contesto. La competenza collocata in uno specifico ambito è la posizione, OK? Allora medico neonatologo è il ruolo, però questo medico neonatologo potrebbe avere un incarico in particolare in cardiologia neonatale OK? Vado proprio a definire puntualmente quella posizione com'è descritta".</i></p> <p><i>(Administrative IS team respondent 2, A-MNIP 4)</i></p>	<p><i>vedere anche queste situazioni. E gestire diversi flussi, come la valutazione annuale, quella pluriennale che è solo per i dirigenti, la valutazione periodo di prova, lo sviluppo delle competenze, il fascicolo virtuale, le missioni o le modifiche come ti dicevo prima del part-time". (Administrative IS team respondent 2, A-MNIP-OVCT 4)</i></p>
<p>Disintegrated HR management practices that reflect bureaucratic culture within the RHO: <i>"Noi abbiamo determinati processi</i></p>	<p>New system should support pre-existing processes the way they are <i>[organizational practices and core technology]:</i></p>

<p><i>che ovviamente tagliano le organizzazioni, insomma in un modo o in un altro. E di fatto abbiamo dei processi che sono abbastanza disintegrati”.</i> (Administrative IS team respondents, A-MNIP 5)</p>	<p><i>“Processi To Be esclusivamente basati sulle aspettative delle persone che ci sono, senza guardare le possibili alternative perché le persone tendono ad aver bisogno, ad esprimere dei bisogni che conoscono. E quindi a lavorare sulla situazione esistente”.</i> (External consultant, A-MNIP-OVOP/CT 5.1)</p>
	<p>That new system will rationalize and optimize the way HR department works [business problematic]: <i>“Allora avevamo anche ripensato in maniera tale che l’organizzazione di questi uffici cambiasse anche un po’, come dire, le proprie responsabilità. Cioè, per dire, invece che la fase di acquisizione, del recruiting, tu fai un pezzo poi io vado da un po’ così un po’ così, la fa tutta un determinato ufficio. Non solo centralizzato, qua sto parlando – Sì, quello sì sarebbe un altro problema, ma diciamo quello è un altro problema maggiore ancora. Ma anche solo negli uffici qua centrali del personale, cioè anche un po’ di razionalizzazione lì, di ottimizzazione”.</i> (Administrative IS team respondents 1&2, A-MNIP-OVOP 5.2)</p>
<p>Technical normative => Business problematic</p>	
<p>Extensive consultative processes that characterize all processes within health organizations: <i>“Perché è una lunga fase di definizione organizzativa”.</i></p>	<p>External help is needed with this project (someone who knows best practices on the market, and who can help with “selling” the project to internal stakeholders) [business</p>

<p>(Administrative IS team respondents 1&2, A-TNIP 6)</p>	<p>problematic]:</p> <p><i>“E quindi serve, come dire, avere qualcuno, tendenzialmente un esterno, un consulente, che ti dica “guarda che questo processo potrebbe anche essere così, potresti togliere questa attività, potresti accorpate queste, potresti usare questa tecnologia per facilitare”. Se io non la uso quella tecnologia non so neanche che esiste. E quindi il nostro compito è quello di tradurre, fare da traduttore simultaneo tra uno che parla in cinese e uno che parla indiano, in inglese. Quindi una terza lingua che permette di vedere altre cose che né chi parla indiano né chi parla cinese riesce a vedere”.</i></p> <p>(External consultant, A-TNIP-OVBP 6)</p>
<p>Mimetic => Organizational practices & Core technology</p>	
<p>The new organizational processes and HRIS specification should be designed without any particular HRIS in mind:</p> <p><i>“Noi volevamo – era una scelta insomma - che il disegno organizzativo non fosse, come dire, troppo orientato verso un particolare sistema”.</i></p> <p>(Administrative IS respondents 1&2, A-MIP 7)</p>	<p>Consulting company helping with the organizational processes design could not participate in the second tender for the new HRIS procurement [organizational practices and core technology]:</p> <p><i>“Il rischio è che magari già nella fase di disegno pensino la tua organizzazione, il tuo sistema in maniera molto, come dire, funzionale poi alla scelta di [new HRIS]...e allora avevamo scelto che questo per definizione non potesse partecipare alla [procurement]”.</i> (Administrative IS respondents 1&2, A-MIP-OVOP/CT 7)</p>

Strategic response

Manipulation

“Queste persone della direzione del personale non si erano mai confrontate con questi metodi un po’ di HR, management, erano un po’ molto all’interno del loro mondo molto normativo, diciamo amministrativo, orientato alla conformità, alla compliance, allora abbiamo detto “facciamo un’iniziativa formativa”, e quindi era stata un’iniziativa molto breve. Venne selezionata per questa iniziativa informativa anche breve questa società e con questa società [consulting company] alla fine loro hanno fatto non so una decina di giornate, cioè una cosa molto compatta. Abbiamo lavorato molto al nostro interno e ne vennero fuori un po’ alcune raccomandazioni condivise con la direzione del personale su possibili aree di intervento, su come fare”.
(Administrative IS team respondents 1&2, A-SR 1)

Compromise

“E devo dire anche le persone di [RHO] si sono mostrate comunque flessibili nel comprendere anche delle logiche un po’ diverse. Quindi è stato un po’ un venirsi incontro vicendevole, però chiaramente sui dati giuridici non si poteva cambiare le cose, dovevamo accoglierli nel modo corretto nel sistema”.
(External consultant, A-SR 2).

Coercive pressure to operate the project within the stated budget (without any possibility for increase) shaped this HRIS project, from adoption through to implementation (A-CIP 1). Interviewed respondents attributed this to a public sector culture that is particularly evident in healthcare. This fixed project budget significantly altered the business problematic component of the organizing vision that organizational actors associated with the new HRIS during the previous innovation stage. Consequently, the new organizing vision for the innovation had to be created in accordance with the available budget, and not in accordance with the expectations formed during the previous stage (A-CIP-OVBP 1).

Another **coercive** pressure that affected this project was due to the national and provincial regulations regarding public sector recruitment (A-CIP 2). This

coercive pressure required changes to be made to the procured off-the-shelf system, so that it could enable the automatic calculation of candidates' recruitment scores (A-CIP-OVCT 2), and also the creation of a ranking list of candidates participating in any selection (according to the evaluation scores they received). These scores had to be calculated very accurately, as they would become public documents (posted online) open to legal challenge by candidates dissatisfied with the outcome of the selection process. Critically, this requirement that the system be customized (to reflect regulatory requirements) introduced additional demands on the core technology to expand beyond the specification given within the already identified budget as demanded by the coercive pressures for a fixed budget.

A final **coercive** pressure manifested in the form of employment regulations that could potentially have legal implications. Thus, interviewed respondents mentioned that in order to avoid any potential legal disputes related to such national/provincial employment/labour regulations (A-CIP 3), the relevant HR processes (e.g. payroll, time and attendance monitoring) were not incorporated into the new HRIS (A-CIP-OVCT 3).

The adoption innovation stage was also influenced by managerial and technical **normative** pressures. Thus, *managerial normative pressure* related to the diversity of HR processes that emerged during the HRIS comprehension continued to be influential at this innovation stage as well (A-MNIP 4 and A-MNIP -OVCT 4).

Moreover, at this stage an additional *normative managerial pressure* emerged and manifested in fragmented and sometimes non-integrated HR processes (e.g.

where part of the HR process could be performed by one HR professional, and the remaining part by another one) (A-MNIP 5). This pressure introduced further changes in the expectations concerning the new HRIS, as some stakeholders (e.g. HR professionals) were envisioning that the new system would support pre-existent HR processes, the way they were (without changing them) (A-MNIP-OVOP/CT 5.1), while others (e.g. Administrative IS team members) expected that the new system would rationalize and optimize the way HR department worked (A-MNIP-OVOP/CT 5.2).

The *technical normative pressure* that emerged during the previous innovation stage and manifested in extensive consultative processes was also present at this stage, as the design of the organizational processes and practices continued during the HRIS adoption stage, and involved numerous stakeholders (A-TNIP 6). However, the organizing vision that was created at this stage involved the presence of an external consultant who was not only aware of all the latest HR best-practices available on the market, but also helped to “sell” the importance of the HR transformation and HRIS implementation projects to various senior project stakeholders and future system users (A-TNIP-OVBP 6).

Finally, in this project there was an attempt to mitigate the potential **mimetic** pressure to design organizational processes and create a system specification with some particular IS in mind (A-MIP 7). Thus, the procurement process was set up such that the consulting company that won the first tender for designing the organizational processes and system specification was not allowed to participate in the later procurement for the new HRIS selection (A-MIP-OVOP/CT 7).

In conclusion, at this stage, the emergence of coercive pressures, the continuation of existing managerial and technical normative pressures, and also some change in the emphasis of normative managerial institutional pressures from the previous stage changed the emerging vision of the organizational actors concerning the HRIS around the *business problematic* and begin to shape specific expectations around the *core technology* and *organizational practices* involved in the adoption of the innovation. The scope of business application narrowed down, with the core technology being restricted to key functionalities that could be achieved within a fixed budget, and excluding any functionality that could cause any legal problems. In terms of organizational practices, on one hand the expectation among some stakeholders was that the new system would help to streamline and make pre-existent HR processes more efficient, while on the other hand others assumed that the new HRIS would just automate pre-existent HR processes. Thus, while at the preceding stage the expectations of organizational actors were broadly cohesive, at this phase conflicts begin to emerge between their different expectations. In order to address these inherent tensions embedded in the emerging organizing vision of the new HRIS, the administrative IS team responsible for the project, responded with *manipulation* and *compromise*. Thus, they involved an experienced external consultant who helped to handle challenging discussions with various stakeholders and also to “sell” the new HR transformation and HRIS implementation projects to future senior system users (*manipulation-A-SR 1*). Meanwhile they also focused on reconciling these different expectations of various stakeholders surrounding the organizational application of the new HRIS

as well as the organizational practices involved in its adoption (*compromise-A-SR* 2).

7.3.3 Innovation Stage 3: Implementation

Different institutional pressures affected system implementation (e.g. the data migration process), determining the business problematic, core technology and organizational practices of the emerging organizing vision (Table 17).

Table 17. Implementation (regional case). Data structure & exemplary quotes

Institutional Pressures	Organizing Vision
<i>Coercive => Business problematic, Organizational practices & Core technology</i>	
<p>Fixed project budget: <i>“Comunque bisogna dire che nella nostra organizzazione noi operiamo sempre a prezzo fisso. Perché è molto difficile una volta che c’è un budget andare a ripianificare, ottenere dei fondi in più così, e poi non volevamo comunque farlo”.</i> (Administrative IS Team Respondent 1, I-CIP 1)</p>	<p>Some HRIS functionality had to be postponed to be realized under the post-implementation budget [business problematic & core technology]: <i>“E volutamente abbiamo lasciato fuori anche delle altre cose che erano priorità 2, per così dire”.</i> (Administrative IS Team Respondent 1, I-CIP-OVBP/CT 1)</p>
<p>Regulation on the RHO’s structure, and managing employee data: <i>“Cioè c’è una legge che dice che la [RHO] è organizzata in articolazioni organizzative fondamentali. Qui troviamo tutti gli ospedali, i distretti, il dipartimento di prevenzione, tutte le strutture macro che formano la [RHO]”.</i> (Administrative IS Team Respondent 2, I-CIP 2)</p>	<p>New HRIS should allow creation of the required organizational structure [core technology]: <i>“È vero che sono inseriti tanti processi diversi, però è anche vero che alla base di tutto ci deve essere sotto un modello, dei ruoli, delle posizioni, cioè come è stato organizzato il database del personale... Allora, è stato un grosso lavoro, abbiamo ordinato tutte le posizioni provenienti dai centri di costo, dal controllo di gestione, provando non tanto a prendere una riga per ogni dipendente, ma raggruppare i dipendenti</i></p>

	<p><i>secondo dei criteri omogenei e cercando di collocare quel dipendente secondo alcuni criteri. Tutti questi criteri li abbiamo chiamati “modello professionale dei ruoli” e sono le fotocopie che ho chiesto prima di stampare... Allora, abbiamo fatto lo sforzo prima di dire non guardiamo le persone, guardiamo prima, partiamo dai dati dell’organizzazione. Dai dati dell’organizzazione vuol dire il primo pezzettino per descrivere l’organizzazione sono le strutture. Partendo proprio dal macro, cosa sono le strutture, quindi gli organigrammi”.</i> (Administrative IS Team Respondent 2, I-CIP-OVCT 2.1)</p>
	<p>System had to be configured to accommodate these legal requirements [core technology]: <i>“Con una corretta mappatura proprio di questi dati giuridici su delle dimensioni che su [new HRIS] esistono, siamo riusciti a gestirli in modo corretto”.</i> (System supplier key project participant, I-CIP-OVCT 2.2)</p>
<p>Strong influence of labor unions: <i>“È ovvio che un’azienda del settore pubblico magari con un importante sindacalizzazione etc. può avere qualche resistenza in più ad alcuni fattori di cambiamento”.</i> (System supplier key project participant, I-CIP 3)</p>	<p>The project had to be discussed and agreed with labor unions [organizational practices]: <i>“Quando è stata fatta la nuova valutazione, le schede che hai visto di assegnazioni obiettivi e valutazione c’è stato un passaggio con i sindacati”.</i> (Administrative IS Team Respondent 2, I-CIP-OVOP 3)</p>
<p><i>Technical normative => Organizational practices</i></p>	

<p>Focus in health organizations is on clinical staff and IS to support clinical activities:</p> <p><i>“Il cuore in un’azienda sanitaria è per forza la parte medica, la parte infermieristica, o tutti i profili sanitari”.</i> (Administrative IS team respondent 2, I-TNIP 4).</p>	<p>Time should be invested to explain to diverse clinical staff the benefits of the new HRIS [<i>organizational practices</i>]:</p> <p><i>“È vero anche bisogna dire che è stato fatto un maggiore investimento sulle figure cliniche per allinearle al sistema piuttosto che quelle amministrative”.</i> (Administrative IS team respondents 1&2, I-TNIP-OVOP 4.1).</p>
	<p>The new HRIS is not considered a critical IS [<i>organizational practices</i>]:</p> <p><i>“Sì, però non è un’applicazione critica. Cioè, se il sistema non funziona e devi assumere una persona, la assumi, dico solo una cosa, e mezz’ora dopo inserisci i suoi dati. Non è come un sistema di elaborating o emergency, che se non va il sistema non riesci quasi a – sì, puoi farlo sulla carta ma è più difficile avere accesso alle informazioni per curare il malato. O se ti va giù il sistema di laboratorio e ti serve un emocromo urgente perché è una persona grave, al pronto soccorso, con un’emorragia devi mandare su uno velocissimo a prenderti dall’analizzatore il valore. Cioè quello è un problema serio e grave. [The new HRIS] per noi non è critico. Cioè è brutto se tu convochi una persona per fare un colloquio, una interview di valutazione performance appraisal e sei lì con la persona, vuoi farlo e in quel momento ti cade il sistema eh che cavolo. Non è bello. Però fai l’interview, ti annoti, il giorno dopo – sì, non è bellissimo, diciamo la verità, però non abbiamo mai avuto criticità. Per noi non è un sistema chiamato, definito critico”.</i> (Senior HR Executive, I-TNIP-OVOP 4.2)</p>

<i>Mimetic => Organizational practices</i>	
<p>Influence of the pre-existent HR processes: <i>“Non è stata sfruttata l’occasione di ripensare i processi lavorativi”</i>. (Administrative IS team respondents 1&2, I-MIP 5)</p>	<p>Pre-existent HR processes were replicated in the new HRIS [organizational practices]: <i>“Dicevo a conferma di ciò c’è anche il fatto che quando facciamo degli sviluppi che coinvolgono per esempio l’acquisizione tendiamo a fare degli sviluppi che replicano l’esistente, senza sfruttare l’occasione per dire miglioriamo quello che stiamo facendo e agevoliamo. È proprio una replica. Non viene colta l’occasione [for change]”</i>. (Administrative IS team respondents 1&2, I-MIP-OVOP 5)</p>
Strategic Responses	
<p>Acquiescence: <i>“Era più facile per noi cambiare clinical staff”</i>. (Administrative IS team respondent 1, I-SR 1)</p> <p>Compromise (intra-organizational): <i>“Quindi, insomma, abbiamo avuto un po’ questo tipo di, in generale, questo tipo di problemi [with administrative staff]. E soprattutto sulle periferie... No, anche l’opportunità di cambiare i propri meccanismi [pre-existent HR practices]”</i>. (Administrative IS team respondent 1, I-SR 2)</p> <p>Compromise (inter-organizational): <i>“Si è fatta qualche customizzazione, ma veramente poche sulla parte anche perché questo è un po’ un principio per noi di [system supplier] molto importante. Il sistema è anche facile da customizzare ma la parte fondante è veramente sconsigliata cambiarla perché poi su quello si basa tutto. Quindi andare a customizzare le fondamenta del sistema è un qualcosa di piuttosto pericoloso. Infatti sono riusciti comunque a limitare al massimo queste customizzazioni”</i>. (System supplier key project participant, I-SR 3)</p>	

The **coercive** pressure for operating within the fixed budget continued from the previous innovation stage, but its influence at this stage was primarily on the core technology (new HRIS functionality). (I-CIP 1) This pressure created the expectation that some of the essential system functionality that was originally planned to be delivered, but that did not fit within the approved project budget

would be postponed until the post-implementation (maintenance) stage, for which RHO had secured an additional budget (I-CIP-OVCT 1).

A further **coercive pressure** that became apparent at this stage was provincial regulation specifying requirements for the RHO's organizational structure and the type of employee data to be maintained in the HR records (I-CIP 2). This pressure created an expectation that employee data would need to be uploaded to the system according to the specified format (I-CIP-OVCT 2.1), and also that the system would need to be configured (e.g. creating additional data fields) to accommodate these legal requirements (I-CIP-OVCT 2.2).

Another **coercive** pressure that shaped the implementation stage, was the presence and strong influence of labour unions in the studied country (I-CIP 3). This created an expectation that the project had to be discussed and agreed with them (I-CIP-OVOP 3). Although these labour unions did not challenge the HRIS implementation project itself, it was reported that they blocked the launch of the associated HR practice concerning the auto-evaluation of medical professionals.

Managerial normative pressures present at previous stages (e.g. A-MNIP 4 & 5) continued their influence during the system implementation stage.

Normative technical pressures for prioritising clinical staff and effort in clinical IS innovations also affected the new HRIS implementation stage (I-TNIP 4). Thus the respondents reported that the new system and its potential benefits were primarily promoted among the clinical staff (TNIP-OVOP 4.1). In addition, although the new HRIS is the biggest RHO's administrative system, it is labelled as a non-critical IS, because it is perceived not have a direct impact on patient care delivery (TNIP-OVOP 4.2).

HRIS implementation was also affected by **mimetic** pressures. Here they manifested in the strong influence of the inefficient and fragmented pre-existing HR processes and practices (I-MIP 5). The organizing vision created here echoed the one from the adoption innovation stage (A-MNIP-OVOP/CT 5.1), and some project stakeholders were expecting that the pre-existent HR practices would be replicated in the new system without any change (I-MIP-OVOP 6).

In conclusion, the institutional tensions that emerged during the adoption stage were amplified at the implementation stage leading to significant shifts in the expectations of the organizational actors surrounding mostly the organizational practices and core technology of the new HRIS. Mismatching expectations related to the organizational practices were associated with the impression of some stakeholders that HRIS would support RHO's the pre-existent HR processes the way they were, while other stakeholders envisioned that this project would make RHO's administrative HR processes more strategic and efficient. Moreover, during the implementation stage, tensions among elements of the organizing vision were accentuated: while the core technology was an off-the-shelf product, its organizational application was moving towards a customised system to respond to differences in practices and demands. When the core technology struggled to fulfil business expectations within the fixed project budget, some required functionality was postponed until the post-implementation (maintenance) stage, for which RHO secured an additional budget.

The overall strategic response of the RHO to this project was *acquiescence*. Thus, the new system was fully implemented, although with six months' delay due to the required system configurations that were taking a longer time than was

initially envisioned. However, different groups of organizational actors adopted diverse strategic responses, which reflected the increasing tensions between their expectations as embedded in the organizing vision. Thus, it was reported that clinical professionals, to whom the new system and its potential benefits were prompted the most, responded with *acquiescence* (I-SR 1), while HR professionals, especially those who had been with the RHO the longest, adopted *compromise* (I-SR 2). These HR professionals agreed to proceed with the implementation, demanding however that the RHO's pre-existent administrative HR processes be replicated in the new system without any change, thus calling for some system configurations and/or customizations. In order to accommodate these requirements the Administrative IS team responsible for the project engaged in additional inter-organizational (with the system supplier) and intra-organizational (with HR professionals) negotiations to reach a *compromise* on the types of system configurations to make and on the types of HR processes to change (I-SR 3).

A visual representation of the processes through which organizational actors responded to perceived institutional pressures, interpreted the nature and goals of the innovation itself and its deployment within the organization, and changed their responses over time is presented in Figure 10.

Figure 10. Visual representation of the conceptual framework (regional case)

	Comprehension	Adoption	Implementation
Coercive pressure		Fixed project budget; Regulation on recruitment; Employment regulations that can cause legal outcomes	Fixed project budget; Provincial regulation on the RHO structure; Powerful labor unions
Organizing vision		BP CT	
Normative (Managerial) pressure	EFQM certification; Focus also on managerial activities; Administrative HR practices and low employee satisfaction with them; Reduction of administrative work for HR professionals; Variety of HR management practices	Variety of HR management practices; Disintegrated HR practices	
Organizing vision	BP	BP OP CT	OP
Normative (Technical) pressure	Extensive consultative processes Focus on clinical eHealth projects	Extensive consultative processes	Focus on clinical eHealth projects
Organizing vision	OP	BP	OP
Mimetic pressure	Similar projects in other large organizations	The new organizational processes and HRIS specification should be designed without any particular HRIS in mind	Influence of the pre-existent HR processes
Organizing vision	CT	OP, CT	OP
Strategic Responses	Acquiescence	Manipulation, Compromise	Acquiescence, Compromise

BP=Business Problematic; CT=Core Technology; OP=Organizational Practices

* Intention to adopt pressures continuing their influence throughout the project life cycle

↔ Conflicting organizing visions

7.3.4 Post (project) scriptum

The project was fully completed and the system was widely used across the RHO at the time of the data collection, although some additional system developments (to expand its functionality and organizational application) were still in progress. Overall, the project won two local awards and was referred to as successful by the system supplier (for whom it was the first project in the health sector in the studied EU country), Administrative IS team respondents, and the external consultant.

Its biggest challenge was reported to be finding a compromise between the system configurations and/or internal changes (e.g. to HR processes) to make. The lessons learned report includes such items as having: (a) a clear project governance structure that should be discussed and agreed with all project stakeholders and carefully documented; (b) strong support from senior management; (c) clear communication between all project stakeholders; (d) a support structure for managers, who became responsible for some of the HR processes previously performed only by/with HR professionals; (e) a pilot testing phase; (f) and the necessity of following the order for the HRIS implementation activities. Although, overall, the interviewees' responses were quite positive, they however noted that they expect to see more resistance among clinical professionals when additional HRIS functionality (e.g. that will give them more responsibility for HR processes) will become available.

7.4 Discussion

This chapter reported on the results of the two case studies, exploring the processes through which contextual influences operating within complex organizational settings shaped the same IS innovation during its life course. The comparative analysis of the findings of these case studies, as well as their discussion is presented below.

The interpretive framework adopted draws on the concepts of institutional pressures (DiMaggio & Powell, 1983), organizing vision (Swanson & Ramiller, 1997) and strategic responses (Oliver, 1991) to aid understanding of how the context shaped both organizational behavior and the IS innovation itself (see Chapter 4 for discussion). Thus, the study sheds light on the processes through which organizational actors respond to perceived institutional pressures, interpret the nature and goals of the innovation itself and its deployment within the organization, and change their responses over time. A visual illustration of the contextual frameworks is presented in the Figure 9 and 10.

In this study, first, existing institutional IS concepts explain the comprehension, adoption, and implementation of IS innovations in organizations in terms of demands for conformity to institutional pressures (e.g. Liang, Saraf, Hu, & Xue, 2007; Liu, Sia, & Wei, 2008; Sherer et al., 2016; Son & Bensabat, 2007; Teo et al., 2003). Only relatively recently have IS researchers begun to consider how actors in the innovation process may respond differently to such institutional demands (e.g. Heikkila, 2013; Krell, Matook, & Rohde, 2016), and how these responses may shape the outcome of IS innovation projects (e.g. Bunduchi et al., 2015). This study builds upon such research, showing how actors' conceptions of

the nature, aims and applications of the innovation within the organization (the innovation's organizing vision), and the perceived demands from their environment (institutional pressures) influence their behavior (strategic responses) over time. The degree of coherence between the actors' understanding of the innovation's business problematic, its core technology, and the organizational processes associated with its development and deployment together with the degree of coherence between the organizing visions of different actor categories influenced their strategic responses.

Thus in the national case study in Country 1, the analysis revealed acquiescence in the case of great cohesion (at the comprehension stage), compromise when divergences first appeared (at the adoption stage) followed by a multitude of responses ranging from avoidance to manipulation as the divergence between expectations deepened and misalignments became more obvious (implementation stage).

In the regional case study in Country 2, the analysis again revealed acquiescence in the case of great cohesion at the comprehension stage, compromise or manipulation when divergences first appeared at the adoption stage, followed by compromise when misalignments became more apparent at the implementation stage.

These responses ultimately led to changes in the innovation itself as actors had begun stalling and attempting to derail the innovation in order to cope with the perceived lack of coherence between the different components of the organizing vision, or in extreme cases lack of coherence between the organizing visions of different actor categories. These findings develop institutional research on IS

innovation by providing a conceptual toolkit (institutional pressures, organizing vision and strategic responses) to explore the process through which the social context shapes the nature of IS innovation.

Second, the analysis explored the triggers that instigated the changes in these processes through which the institutional context shaped the innovation during its life course. Existing IS institutional research concerned with changes over time tends to focus on institutionalization processes at the field level (e.g. Currie & Guah, 2007), often drawing on the organizing vision concept (Currie, 2000; Kaganer, Pawlowski, & Wiley-Patton, 2010; Wang & Swanson, 2007). However there has so far been little research examining changes in actors' strategic responses to institutional pressures during the process of innovation implementation within organizations. One exception is a study by Standing et al. (2009) which examined how changes in institutional pressures over time resulted in conformity or non-conformity responses within a particular government organization. The study finds that such changes in responses over time can be attributable, not only to misalignments between the organizing visions of different actors for the same IS innovation, but also to changes in the same actors' expectations of the IS innovation.

Thus, in my study, changes in the macro-institutional environment, such as the financial crisis in the national case study of Country 1 that introduced new coercive pressures during the adoption of the innovation, did play a role in shaping strategic responses. However, it was also shifts in actors' strategic responses over time that were more closely linked to changes in the configuration of institutional pressures at different stages of the innovation life cycle. Most of

these pressures and contradictions were in fact present throughout the innovation stages in both case studies but only became more obvious and salient to the actors involved once the focus of the project moved from comprehension to delivery, highlighting misalignments that had hitherto been underplayed or worked around. The analysis indicates that at the comprehension stage, a perceived alignment between all three types of institutional pressures led to a shared expectation across the NHO in the national case study in Country 1 and across the RHO in the regional case study in Country 2 that the new IS would be universally implemented and produce efficiencies that would benefit all actors. This alignment led to cohesive expectations concerning the core business problematic of the innovation and resulted in an initial acquiescence response in both case studies, whereby organizational actors rallied behind the dominant organizing vision and supported the innovation.

Underlying this overt alignment there were however clear contradictions. For example, in the national case study in Country 1 the fact that the system could not be locally customized placed demands on the RHOs to modify their existing HR practices and structures, something which was not acknowledged by the organizational community at the outset. In the regional case study, the need to change pre-existent HR processes and practices, such that they would require managers and employees to take responsibility for some actions that were previously performed with or by HR professionals, also did not seem to be acknowledged at the beginning of the project.

As the innovation progressed through adoption and implementation in both case studies, the actors were forced to acknowledge misalignments between coercive,

normative and mimetic pressures, thus focusing their attention on inherent contradictions, conflicting expectations, technological problems and organizational change requirements that had previously been overlooked. Progressive divergence between institutional pressures also become more evident over time, challenging actors' organizing vision and leading to multiple strategic responses.

Thus, in the national case study in Country 1 changes in the actors' attention on the inherent conflict between demands for standardization arising from the digital integration agenda versus pressures for adaptation to local practices played a more important role in explaining the tensions within the organizing vision and the rise in non-conformity responses over time, than was played simply by the rise of financial pressures at the adoption stage.

Meanwhile, in the regional case study in Country 2, mismatching expectations on the part of different stakeholders regarding the type of changes that the new HRIS was supposed to introduce to pre-existent HR practices (changing these practices versus replicating them in the new HRIS) played an important role in explaining the adoption of a compromise strategic response over time.

In summary, in both case studies, this shift in the individual focus of attention from the convergent to the divergent institutional pressures disrupted the organizing vision and triggered changes in actors' strategic responses, and it is these which ultimately explain the changes in the IS innovation and its organizational application over time, from broad support to limited implementation and deployment, and from large, single, standardized systems to

smaller, more localized and less ambitious systems, with many features included in the original vision transformed, postponed or even eliminated.

7.5 Conclusion

This chapter reported on the results of the study, examining the processes through which the social context shaped the comprehension, adoption and implementation of HRIS innovation in health organizations in two different EU countries. A qualitative case study of implementation sites revealed how changes in the alignment of institutional pressures over time challenged actors' "organizing vision" for the innovation, leading to both facilitative and obstructive strategic responses, as well as informing changes to the innovation itself. These changes also reflected the shifting focus of actors' attention at different stages of the innovation life-course.

The following (final) chapter will elaborate upon the main findings of this thesis, underline its main contributions, and to identify the limitations of the study and how they have been addressed.

8. Chapter 8

CONCLUSION

8.1 Introduction

This final chapter begins by drawing together the analysis carried out in the previous chapters and linking them to the initial aims of this research (research questions). It then analyzes the research limitations, and discusses theoretical contributions and practical implications concerning the international analysis on the development and implementation of HRIS in health organizations that this study offers for managers planning or implementing HRIS, academics studying eHealth, HRIS or HRM, and policymakers or research sponsors considering an investment in HRIS, health informatics or IS in general. Finally based on the identified research limitations, this Chapter makes a proposal for the future research areas.

8.2 Synthesis of research objectives and research findings

This research started from a comprehensive literature review which confirmed that studies on HRIS in health are under-represented in the interdisciplinary literature that prioritize studies on clinical IS. Most published research is based on softer forms of evidence and there are important gaps in knowledge about the expected benefits and actual outcomes of HRIS initiatives or socio-contextual or technological factors influencing their development or implementation success. Moreover, existing studies on HRIS in health mostly represent applied projects and do not advance theoretical understanding of HRIS development,

implementation or use. Finally, it did not identify any study that compares HRIS projects across countries.

Thus the main objective of my case-study research was set to analyse and compare the expected benefits and actual outcomes of HRIS projects in two different contexts, as well as to empirically examine whether the seven key influencing factors identified in the systematic literature review (see Tursunbayeva et al., 2016) affected these projects. Moreover, drawing on the institutional literature it also aimed to examine the processes of HRIS development and implementation that led to these outcomes.

The specific research questions guiding the realisation of these research objectives and associated findings are presented below:

- *RQ1: What are the expected benefits, actual outcomes and unintended consequences of introducing a new technological innovation – HRIS?*

I further advance Parry and Tyson's (2010) HRIS benefits model by drawing from HRIS research in healthcare (Tursunbayeva et al., 2016), thus developing an application framework specific to this context. The research findings confirm that this framework is valid, because: (1) I find all benefits categories proposed by Parry & Tyson, 2010, except the expected benefit for improving *Organizational image*; and because (2) I also find that while the regional HRIS project was driven only by the expected benefits identified in the previous research (Parry & Tyson, 2010), the larger scale national HRIS project was also driven by the particular requirements of the health sector (Tursunbayeva et al., 2016), such as achieving adherence to statutory health workforce reporting requirements (e.g. Waring, 2004; Waters et al., 2013) and optimising patient care (e.g. Thouin & Bardhan,

2009; Spaulding, 2012). In addition to the benefits from the framework I proposed, I have also identified a further expected benefit in both projects – *Benchmarking* - that can take place at different levels: (1) the level of individual employees; (2) the level of individual RHOs; and (3) the level of NHO.

- *RQ2: What are the expected benefits and outcomes for diverse HRIS project stakeholders and/or user groups?*

My empirical analysis confirms that HRIS are designed and used by a wide variety of users, and illustrates that benefits from HRIS projects are not only expected by various organizational stakeholders, but also can vary between them.

In line with the existing research (Coombs, 2015; Dhillon, 2005; Doherty et al., 2012), I find that few of the expected benefits have actually been realised in the implementation projects I studied. The analysis also finds significant differences in the realisation of benefits across the two cases, with very few of the initially expected benefits being achieved for the national HRIS project, while the most expected benefits were reported as achieved in the regional project. The common achieved benefits in both case studies included: improved Operational Efficiency for Employees, Managers and HR Professionals; Standardization of pre-existent HR processes, systems or their data for HR Professional; and Empowerment of Managers and Employees.

The analysis of the implementation process through which benefits are realised also provides an indication of the process through which the realisation of these benefits took place. While existing research suggests that the realisation of benefits is a process that takes place during the IS implementation (Caldeira et al., 2012), my analysis provides clear evidence that benefits realization takes place

also during IS use. Results of my analysis also demonstrate that some expected benefits were planned to be achieved for some particular stakeholders, only after they could be achieved for other stakeholders group/s. Thus, my findings for both case studies also led to the identification of a complex set of interdependencies both across different categories of benefits and between different actors.

- *RQ3: What are the factors that influence the transformation of expected HRIS benefits into realized benefits?*

Results of the analysis unveil several critical requirements that the new system was supposed to meet (e.g. the system needs to be used by everyone), as well as a range of sociotechnical factors that shaped the implementation of both HRIS projects, and affected or facilitated the realization of their envisaged benefits, including *Environmental, Inter-Organizational, Organizational, Individual, and Project, Technology, Task* related factors.

Thus, in this study I empirically confirmed the findings of the systematic literature review, where I identified that the aforementioned seven socio-technical factors can significantly influence and shape HRIS development and implementation projects in health. Finally, as the findings of these case studies revealed more factors that can affect HRIS initiatives in health compared to generic IS implementations (Kwon & Zmud, 1987), I suggest that regional and national HRIS projects in health context are particularly complex.

- *RQ4: How do institutional pressures shape the development and implementation of an ICT innovation within an organization's setting over time?*

This study is built upon institutional IS research and examines how actors in the innovation process may respond differently to various institutional demands (e.g. Heikkila, 2013; Krell et al., 2016), and how these responses may shape the outcome of IS innovation projects (e.g. Bunduchi et al., 2015), showing how actors' conceptions of the nature, aims and applications of the innovation within the organization (the innovation's organizing vision), and the perceived demands from their environment (institutional pressures) influence their behavior (strategic responses) over time. The degree of coherence between the actors' understanding of the innovation's business problematic, its core technology, and the organizational processes associated with its development and deployment influenced their strategic responses. These responses ultimately led to changes in the innovation itself, as actors had begun stalling and attempting to derail the innovation in order to cope with the perceived lack of coherence between the different components of the organizing vision or lack of coherence between the organizing visions of different actors.

Thus, results indicate that in both case studies at the comprehension stage, alignments between all three types of institutional pressures led to cohesive expectations concerning the core business problematic of the innovation and resulted in an initial acquiescence response. As the innovation progressed through adoption and implementation, misalignments between coercive, normative and mimetic pressures begin to manifest more strongly, exposing the inherent conflicting expectations that became part of the organizing vision about the technology itself, the organizational practices that would be changed and how these would be addressed by the innovation. Research findings also revealed that

as changes in institutional demands increase the tensions within the organizing vision, the variety in response strategies also increases reflecting greater uncertainty. Thus, whilst previous research indicates a linear move from acquiescence to manipulation as environmental uncertainty increases (e.g. Oliver, 1991), findings of this research suggest an increase in the variety of responses during the adoption or implementation stages.

8.3 Research limitations

As with any research my PhD study has a number of limitations (Cucciniello, 2011).

The Systematic Review excluded purely descriptive reports and case studies, such as those developed by HR and clinical practitioners, from which valuable insights could nevertheless be obtained. Future researchers may wish to re-examine the evidence using more inclusive methods, such as the scoping review approach (Arksey & O'Malley, 2005, etc.) in order to capture this experiential knowledge. The timeline of the review also means that some recent studies have not integrated although this is normal for systematic reviews, which are often updated after two or more years, as others may do in this case. While multiple publications have emerged from the United States Agency for International Development's Capacity and Capacity Plus programs on global health workforce strengthening, only two were included; the final report for the Capacity project (IntraHealth, 2009) and the last available report on the Capacity Plus project (Shukla et al., 2014), however these were selected as they provide a fair representation of the overall findings of this program and its activities. In common with other systematic reviews,

publication bias is a risk, as most of the published studies report only positive results and several were compiled by consulting firms paid by the organizations who had commissioned or were implementing the projects (Tursunbayeva et al., 2016).

With respect to the national case study in Country 1, the innovation was studied while still in the process of implementation and technical iteration. This HRIS implementation project is far from over, and the processes surrounding the shaping of the innovation as it becomes deployed and used through the NHO are still evolving. As such, although covering a period of seven years (including retrospective recall), this case study reflects only a portion of the innovation lifecycle and merits follow-up research to determine the eventual translation of expected to realized outcomes. The regional case study in Country 2 nevertheless allowed for a comparison with a similar HRIS programme in the post-implementation phase, yielded further insights and research recommendations regarding the need for long-term evaluation.

Lastly, I examined the contextualization of IS innovation only in one sector: healthcare. While the complexity of the healthcare systems provides rich opportunities to explore the role of context in shaping IS innovation (see also Sherer et al., 2016), it is also a unique environment. This affects the generalizability of the study findings, particularly the specific relations between pressures, organizing vision and responses, which may not be transferable to other settings. This focus nevertheless provided a unique addition to the literature and later research may help to determine whether the unique influencing factors identified in this study are also evident in the context of other healthcare

organizations. Nevertheless, qualitative research is not typically aimed at achieving generalizability but also understanding uniqueness and uncovering insights that invite future research. For example, the regional case study in Country 2, the increase in actors' responses variety over time may not be seen elsewhere, whilst in other cases of "successful" implementations a reversal in the evolution process might be observed as divergent expectations gradually converge during the innovation life course. Be that as it may, the conceptual framework developed in my PhD research offers value for other studies of HRIS in healthcare, as well as studies in non-healthcare settings, for exploring the role that context plays in shaping the outcomes of IS through examining a range of institutional pressures, their influence on actors expectations of the innovations, and linking these expectations to professional and organizational behavior during the innovation lifecycle.

Thus, despite its limitations, my research offers a new set of insights and theoretical innovations which call for future studies to explore their applicability within and outside of the health sector.

8.4 Theoretical and practical contributions and implications for future research

The findings of this research offer the following specific insights for theory, policy and practice.

8.4.1 Contribution to theory

By identifying and analysing all existing published research on HRIS in health, this study provided a synthesis of all the theoretical frameworks used in these studies up to date. It also concluded that studies on HRIS in health, as with studies of clinical systems, often fail to build on prior research (Boonstra et al., 2014), mostly represent applied projects which do not advance theoretical understanding of HRIS development, implementation, or use (Tursunbayeva et al., 2016).

This study builds on previous research on benefits (whether expected or realized) associated with the adoption of HRIS (e.g. Lepak & Snell, 1998; Parry & Tyson, 2011; Ruel et al., 2004), and explains the process through which benefits are realized, and factors of influence from the generic IS research (Cooper & Zmud, 1990; DePietro et al., 1990; Kwon & Zmud, 1987) that can affect this process. It also provides an extended and empirically tested model on the expected and realized benefits from HRIS for different stakeholders (who participate in the implementation process) that also illustrates: (1) what kind of benefits motivate different stakeholders to accept HRIS initiatives; (2) what kind of benefits and for whom these initiatives can actually achieve; (3) and how the benefits can be interconnected between each other. This taxonomy can be used by future scholars with research interest in this topic to check its applicability for other health organizations or its generalizability to HRIS projects in other sectors/industries.

Moreover, this study building upon existing research on how IS actors respond to multiple and conflicting institutional pressures (Berente & Yoo, 2012; Bunduchi et al., 2015; Jensen, Klaergaard, & Svejvig, 2009; Krell et al., 2016; Standing et al., 2009) has yielded a framework for describing the process through which

social context shapes organizational IS innovations over time. This framework provides a means by which future researchers can explore the contextualization process of IS innovations in complex organizational settings. It offers a granular method for examining how institutional pressures shape IS innovations through examining their influence on components of the organizing vision (business problematic, core technology and organizational processes) and their role in shaping organizational actors' responses (varying from acquiescence to manipulation). The study also shows how this framework can help to explain changes in IS innovations during their life course, not only through mapping changes in the institutional environment but also how the focus of actors' attention is drawn to different configurations of institutional pressures associated with different innovation stages. This finding thus adds to the IS research on micro-level responses to institutional pressures (e.g. Hultin & Mahring, 2014; Jensen et al., 2009) by showing how examining the shifts in the different components of the organizing vision over time allows us to understand actors' responses to conflicting institutional pressures, and how these responses change with time. Thus the study finds that changes in actors strategic responses over time can be attributable not only the misalignments between the organizing visions of different actors for the same IS innovation (as was found in the previous institutional IS research), but also to changes in the same actors' expectations of the IS innovation.

Through its empirical focus on HRIS in health, this institutional study also helped to deepen existing understanding of the processes involved in the comprehension, adoption and implementation of IS innovations in the health sector, which are

shaped as much by regulatory, cultural and structural forces, as by technical and economic ones, and by misalignments amongst them. Thus, this study contributes to the research examining the adoption of technological innovation in healthcare which calls for a contextual approach to better explore the role that organizational factors play in shaping innovation adoption (Robert et al., 2009).

8.4.2 Contribution to policy and practice

The findings of this research also offer useful insights for policy and practice. Sophisticated HRIS are being adopted by health organizations worldwide, often at great expense (Harris, & Spencer, 2015). Given the challenges involved in successfully delivering such projects at scale (Thite & Sandhu, 2014) healthcare decision makers require more guidance on how to smooth the implementation processes, to ensure these systems can yield the benefits they promise (Tursunbayeva et al., 2016).

The insights and recommendations arising from this PhD research will be valuable for health policymakers and planners seeking to procure and implement these innovative information systems. In particular, they make it clear that merely having strong support for a project at the outset is no guarantee of trouble-free implementation and appropriate change management, which takes account of and seeks to reconcile the expectations of all players will be vital for success. Moreover, adequate time needs to be allowed for these processes to occur and to monitor the ebb and flow of opinions and mitigate tensions when they arise. Evaluating such complex programmes, especially where these are widely scaled and involve multiple organizations, also requires a long-term view and adequate

funding and human resource should be invested in this, whether for research or audit. The results also offer opportunities for self-reflection on the part of those implementing such systems, recognising their driving motivations, such as pressures to match competitors, and understanding how these affect organizational behaviour.

Further progress in this area will be helped by having a comprehensive analysis of the interdisciplinary and applied literature on HRIS in health, having additional time and resource to map all the potential expected and realized benefits that HRIS projects can have in healthcare organizations, understanding that institutional pressures can shape stakeholders' strategic responses to such innovations and recognising the importance of aligning these to ensure that the organizing vision for the innovation is universally understood, coherent and stable over time.

8.5 Conclusion

Drawing on the results of documentary analysis and stakeholder interviews this study compared the expected benefits driving implementation of the same particular technological innovation - HRIS - in two different EU countries with those that were actually achieved. Moreover, drawing on institutional theory perspective it examined the processes of HRIS development and implementation that led to the current project outcomes.

The use of existing theoretical frameworks helped to inform the analysis and interpretation of the expected and realized benefits of the HRIS projects and to identify factors of influence that had affected their realization which, in turn,

suggested adaptations that may be required for studying HRIS in healthcare. Institutional theory also proved a valuable tool for interpreting the unexpected difficulties that the health organizations encountered during the implementation of an innovation that had been strongly supported at the outset.

Finally, although each of two case studies was conducted independently, the smaller scale regional HRIS development and implementation project in Country 2 made it possible to assess the replicability of the methodological and theoretical approach used for the case study in Country 1, and the results further enhanced the analytical approach taken and the theoretical innovation arising from the research.

The results of my research, and the unanswered questions remaining, indicate the importance of HRIS to the effective and efficient functioning of healthcare systems, and suggest the need for more interdisciplinary research, encompassing economic evaluations, sociotechnical analyses, studies of information flows, and systematic assessments of the impacts of better workforce information on health care efficiency, quality, safety, and patient care, as well as new exploratory research to understand the value of information for driving analytics in support of sustainable and effective health systems.

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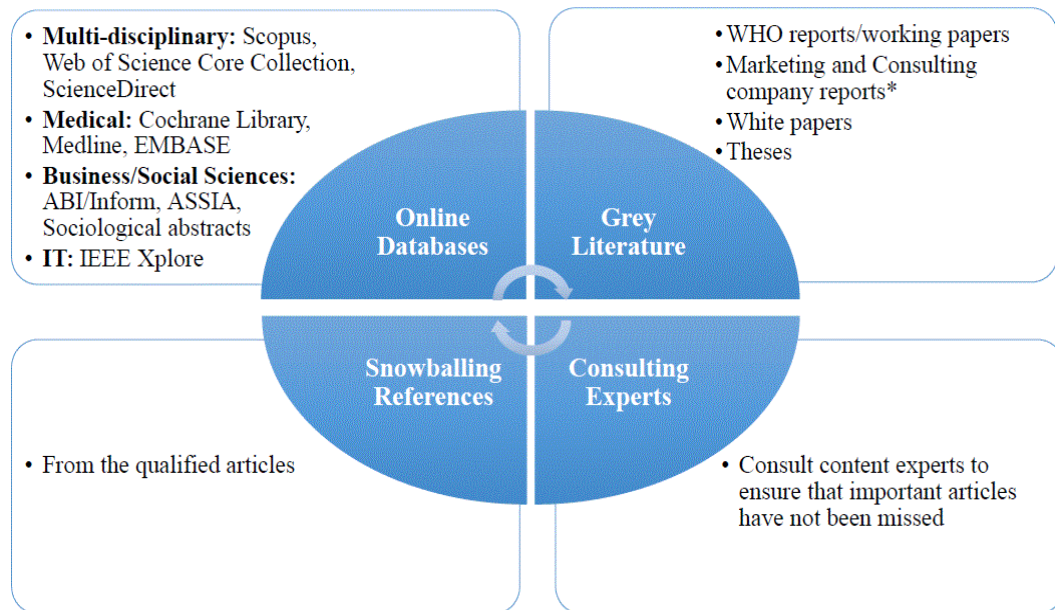
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Appendices

Appendix 1. Systematic literature review search strategy



*CIPD, Deloitte, Ernst & Young, PWC, KPMG, Society for Human Resource Management (SHRM), Towers Watson, McKinsey & Company, Boston Consulting Group and Sierra-Cedar.

1. Search query: free field-format

(Health OR Healthcare OR Hospital* OR Clinic* OR Medic*) AND ("HR management system*" OR "Human resource management system*" OR "Workforce management system*" OR "Personnel management system*" OR "Manpower management system*" OR "Employee management system*" OR "Staff management system*" OR "E-HR" OR "e-HRM" OR eHRM OR HRIS OR "electronic Human resource" OR "HR information system*" OR "HR technolog*" OR "HR management information system*" OR "HR administration system*" OR "Human resource information system*" OR "Human resource management information system*" OR "Human resource administration system*" OR "Workforce information system*" OR "Workforce technolog*" OR "Personnel information system*" OR "Personnel management information system*" OR "Personnel administration system*" OR "Manpower information system*" OR "Manpower management information system*" OR "Employee

information system*" OR "Employee management information system*" OR "Staff information system*" OR "Staff management information system*" OR "Staff administration system*" OR "HR information technolog*" OR "HR management technolog*" OR "Human resource information technolog*" OR "Human resource management technolog*" OR "Human resource* technolog*" OR "Personnel Staffing and Scheduling Information Systems" OR "electronic HRM" OR "Virtual HRM" OR "Web-based HRM" OR "HR Portal" OR "HR Online" OR "HR Intranet" OR "E-recruit*" OR "Electronic recruit*" OR "E-employment" OR "Virtual HR" OR "Web-based HR" OR "Business-to-employee" OR "Employee self service")

b) Search query: Medline format

1. Health.mp. or Health/
2. Healthcare.mp. or "Delivery of Health Care"/
3. Hospital.mp. or Hospitals/
4. Clinic*.mp.
5. Medic*.mp.
6. 1 or 2 or 3 or 4 or 5
7. "HR management system*".mp.
8. "Personnel Staffing and Scheduling Information Systems"/
9. "Human resource management system*".mp.
10. "Workforce management system*".mp.
11. "Personnel management system*".mp.
12. "Manpower management system*".mp.
13. "Employee management system*".mp.
14. "Staff management system*".mp.
15. "E-HR".mp.
16. eHRM.mp.
17. "e-HRM".mp
18. HRIS.mp.
19. electronic Human resource.mp.
20. HR information system.mp.

21. HR technology.mp.
22. "HR management information system*".mp.
23. "HR administration system*".mp.
24. Human resource information system.mp.
25. "Human resource management information system".mp.
26. "Human resource administration system*".mp.
27. "Workforce information system*".mp.
28. "Workforce technology".mp.
29. "Personnel information system".mp.
30. "Personnel management information system".mp.
31. "Personnel administration system".mp.
32. "Manpower information system".mp.
33. "Manpower management information system".mp.
34. "Employee information system".mp.
35. "Employee management information system".mp.
36. "Staff information system".mp.
37. "Staff management information system".mp.
38. "Staff administration system".mp.
39. HR information technology.mp.
40. HR management technology.mp.
41. Human resource information technology.mp.
42. Human resource management technology.mp.
43. "Human resource technology".mp.
44. "Electronic HRM".mp.
45. "Virtual HRM".mp.
46. "Web based HRM".mp.
47. "HR Portal".mp.
48. "HR Online".mp.
49. "HR Intranet".mp.
50. E-recruiting.mp.
51. Electronic recruiting.mp.
52. "E-employment".mp.

- 53. "Virtual HR".mp.
- 54. "Web-based HR".mp.
- 55. "Business-to-employee".mp.
- 56. "Employee self service".mp.
- 57. 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20
or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34
or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48
or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56
- 58. 6 and 5

Appendix 2. Study information sheet

Human Resources (HR) system rollout case study - information letter

I am asking if you would agree to take part in a research project aiming to examine the development, implementation and usage of the new HR system.

What is the purpose of this research?

The research examines the process through which HR systems are developed, implemented and used within large and complex organizations, and what kind of impacts they can have. We believe that insights from this case will provide valuable lessons for decision makers and managers considering or already implementing HR systems and encourage new research on this topic.

Why have I been asked to take part?

You have been asked to take part in this research because you have played a significant role during the development, implementation or usage of the HR system.

What will happen next if I agree to take part in the study?

- Following your consent, an interview will take place. The aim of the interview is to map the development, implementation and usage of the HR system since its inception to present day. Questions will focus on organizational factors and stakeholders that affected the decision to implement this HR system, change management strategies used to implement this system in different boards, as well as the challenges and facilitators faced during implementation.
- With your permission, the interview will be audio-recorded. Otherwise, the researcher will be taking notes. After the interview, the interview will be transcribed and the transcription will be emailed back to you for verification. The interview transcription is anonymized, unless you give consent otherwise.

You are free to withdraw at any point from the interview / research without giving any reasons.

What will happen to the results of the study?

The results of this study will contribute towards knowledge and future research on the development and implementation of HR systems in large and complex organizations. The results will also be fed back into [NHO] to inform ongoing implementation efforts and as a means of supporting organizational learning. Research insights will also be used in academic publications and conference papers.

Researcher contact information:

Aizhan Tursunbayeva, Visiting Doctoral Researcher, University of Edinburgh;
email: aizhan.tursunbayeva@gmail.com

Thank you very much for reading this

Appendix 3. Interview guide

Semi structured interview questionnaire used to guide discussions with respondents:

- What organizational factors and people influenced the decision to purchase and implement Human resource information system (HRIS)?
- What consultative processes were used to inform the procurement, design or customization of the system to meet to the needs of the organization and users?
- What were the expected benefits of the system, how have they changed over time and to what extent were they realized? And what were the unintended consequences?
- What change management strategies were used during the implementation of HRIS in different RHOs and how successful were they?
- What similarities and differences are apparent across different RHOs, in terms of the ways in which the HRIS was integrated, adopted and evaluated?
- What are the outcomes/consequences of implementing HRIS in different RHOs and what might explain these differences?
- How have different RHOs experienced the implementation process and what factors might explain that variation. How do you think this influenced adoption and use of the system?

Appendix 4. Application for ethical approval

University of Edinburgh Business School Level 1 and 2⁸ Research Ethics Applications

Name(s) of Investigators: Raluca Bunduchi (Business School), Aizhan Tursunbayeva (visiting PhD student eHealth Research Group, Centre for Population Health Sciences), Claudia Pagliari (eHealth Research Group, Centre for Population Health Sciences)

Title of Proposal: Human Resource Information Systems (HRIS) in Healthcare: case study of [Country 1] HRIS rollout

Please provide a brief outline of the research aims and the proposed methodology, highlighting any anticipated ethical issues (on separate sheet if necessary):

HRIS are vital for the effective running of health systems and address many of the information, communication, and training issues of health professionals as well as providing human resource managers with high-quality data, however they have not been well studied. This [Country 1] HRIS implementation project is taken as a case study to addresses existing literature gaps by examining how HRIS is developed, implemented and used in large and complex organizations and what kind of impact they can have. In 2009 the [NHO] in [Country 1] approved a business case for a single HRIS to be used across all [RHOs] and integrated into local [RHOs] systems and the national Payroll system. Although many Boards already had HRIS at that point of time, information they provided on [NHO] staff was not standardized. This national project is running late and has proved to be difficult, although it still continues. To obtain more insight on this project we are

⁸ Level one: applies to 'straightforward' non-intervention, observational research (data, observation, questionnaires)

Level two: 'straightforward' engagement with participants or participant groups (interviews, focus groups etc.)

planning to interview key project stakeholders as a part of our research. The final list of interviewees is being finalised; however it is planned that interviews will be conducted with [NHO] staff and potentially with HRIS vendors. We are not planning to interview patients for this research. We already have confirmation (please see attached) from the Scientific Officer from [NHO] stating that this study does not require [NHO] Ethical approval, i.e. “if the study involves only [NHO] staff recruited by virtue of their professional role then there is no requirement (policy-wise or legally) for [NHO] ethical review”. We believe that insights from this case will provide valuable lessons for decision makers and managers considering or already implementing HRIS and encourage new research in this area.

I have read the *Business School Research Ethics Policy* and agree to abide by it.

In the case of human subjects in research: (delete as necessary)

Participants will be told about the objectives of the study. **Yes/No**

Any hazards will be explained to them. **Yes/No**

Participants will be informed they are participating of their own free will and consent. **Yes/No**

They will be informed that they are free to withdraw at any point should they wish to. **Yes/No**

Information will be held in confidence and any information used will be used anonymously unless consent has been given otherwise **Yes/No**

I confirm that this study does NOT involve children (under 18), institutionalised people; or other individuals who are vulnerable or unable to give consent. **Yes/No**

I have considered the risks of physical or psychological harm to research participants (including the researchers) and how to address these **Yes/No**

Please provide explanations in the case of a negative response to any of the above questions.

Signed Raluca Bunduchi

Date

11/07/2015

Appendix 5. Scientific outputs arising from the PhD (journal and conference papers)

Published in International Peer-Reviewed Journals:

1. Tursunbayeva, A., Franco, M., Pagliari, C. (2017) Use of Social Media for e-Government in the Public Health Sector: A Systematic Review of Published Studies. *Government Information Quarterly*.
2. Tursunbayeva, A., Bunduchi, R., Franco, M., Pagliari, C. (2016). Human resource information systems in health care: a systematic evidence review. *Journal of American Medical Informatics Association*.
3. Pagliari, P., Tursunbayeva, A., Bunduchi, R., Franco, M. (2016). Smartening-up NHS workforce management with IT. *BMJ (Blog)*.
4. Franco, M., Tursunbayeva, A., Pagliari, C. (2016). Social Media for eGovernment in the Public Health Sector: Protocol for a Systematic Review. *JMIR Res Protoc*; 5(1):e42.
5. Tursunbayeva, A., Pagliari, C., Bunduchi, R., Franco, M. (2015). Human resource information systems in healthcare: a systematic review (protocol). *JMIR Res Protoc*; 4(4):e135.
6. Franco, M., Tursunbayeva, A., Pagliari, C. (2015). Adoption and use of social media for eGovernment in the public health sector: a systematic review. *PROSPERO*: CRD42015024731.
7. Tursunbayeva, A., Pagliari, C., Bunduchi, R., Franco, M. (2015) Human resource information systems in healthcare: a systematic review. *PROSPERO*: CRD42015023581.
8. Franco, M., Tursunbayeva, A. (2014). Mobile Technology and Public Health Organizational System. *Symphonya. Emerging Issues in Management*, n.1, p. 80-89.

In preparation (close to submission):

1. Contextualizing Information System Innovation in Healthcare: a qualitative study of a nation-wide Human Resource Information System adoption program. *Journal TBC*.

2. Tursunbayeva, A., Bunduchi, R., Pagliari, C., Franco, M. What does it take to implement a Human Resource Information System (HRIS) at Scale? Analysis of the Expected Benefits and Actual Outcomes. *Journal TBC*.

Book Chapters:

1. Tursunbayeva A. (2016). Information and Communication Technology (ICT) Innovations in complex organizations: Analysis of Human Resource Information Systems (HRIS) in Healthcare. In M. Franco (Ed.), *Research Paths of PhD in Innovation and Management of Public Resources*.
2. Tursunbayeva, A., Franco, M. (2014). L'integrazione della Mobile Technology nel sistema complesso della sanità pubblica. *Quaderni di Scienza e Scienziati Molisani*.

Conference Proceedings:

1. Tursunbayeva, A., Bunduchi, R., Pagliari, C., Franco, M. (2016). Development and implementation of a countrywide Human Resource Information System (HRIS): Opportunities and Challenges. 6th International e-HRM Conference. University of Twente. Netherlands.
2. Tursunbayeva, A., Bunduchi, R., Pagliari, C., Franco, M. (2016). Thinking big whilst making do: Mismatching expectations of a national human resource management system in healthcare. 32nd EGOS Colloquium, 2016, Naples, Italy.

Presentations at Referred Conferences/Workshops:

1. Tursunbayeva, A., Bunduchi, R., Pagliari, C., Franco, M. (2016). What does it take to implement a Human Resource Information System (HRIS) at Scale? Analysis of the Expected Benefits and Actual Outcomes. 31st Workshop on Strategic HRM, European Institute for Advanced Studies in Management, Spain.
2. Tursunbayeva, A., Bunduchi, R., Pagliari, C., Franco, M. (2016). Mismatching Expectations of a National IT system for Human Resource

Management in Healthcare. University of Edinburgh Business School Workshop on “Organizational and Institutional Change”, Edinburgh, UK.

3. Tursunbayeva, A., Pagliari, C., Bunduchi, R., Franco, M. (2015). HRIS in Healthcare. Farr Institute Health Informatics Conference, St. Andrews, UK.
4. Tursunbayeva, A. (2015). Poster for “HRIS in Healthcare: Systematic Review”. Farr Institute PhD Symposium, Manchester, UK.