

What does it take to implement Human Resource Information System (HRIS) at scale?

Analysis of the Expected Benefits and Actual Outcomes¹

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ABSTRACT

Human resources information systems (HRIS) have potential to help organizations to achieve their strategic objectives but few academic studies have provided evidence of their effectiveness in doing so. This is especially true for HRIS studies conducted within the context of healthcare sector, where most literature related to IT has tended to prioritize clinical systems over administrative ones. This paper addresses this research gap and reports intermediary results from a study of the development and implementation of HRIS in national health organization of one European country. Drawing on the results of documentary analysis and stakeholder interviews, it compares the expected benefits driving implementation of the system with those that were actually achieved, as well as the unintended consequences and aspects of the development and implementation process that led to the current project outcomes.

The preliminary analysis suggests that HRIS implementation in health organizations is driven by similar expected benefits to those driving implementation on other types of organization. However, they are also driven by organizational practices to benchmark themselves to the sector leaders and by particular requirements of the health sector, such as achieving adherence with statutory health workforce reporting requirements and optimising patient care. In this multi-site HRIS programme the benefits are likely to derive not from the direct effects expected from the system but because the HRIS project acted as a catalyst for greater consensus on the need to standardize HR information practices. A range of additional sociotechnical factors – Technological, Environmental, Organizational and Local - helped to shape the implementation of the system and affected the realization of its envisaged benefits.

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The study adds to the interdisciplinary literature on HRIS in health organizations by addressing gaps in (a) studies of large-scale transformations in healthcare; (b) studies of national-scale HRIS projects; (c) empirical comparisons of expected benefits and outcomes, and factors influencing them; (d) and demonstrations of HRIS programme benefits at different organizational and institutional levels.

INTRODUCTION

Human Resource Function and Human Resource Information Systems

While the management of Human Resources (HR) has often been regarded as a purely administrative activity, organizations in today's knowledge economy increasingly recognize that their success depends "disproportionally on the performance of their HR" (Lippert and Swiercz, 2005; Troshani, Jerram & Hill, 2011). Over the years HR departments have adopted Information Technology (IT) to automate administrative tasks such as Payroll, in order to free-up time for more strategic tasks within their organizations. Today around 93% of organizations reportedly use HRIS for administrative (e.g. Payroll or Benefits administration), 66% for service delivery (e.g. HR Portal), 58% for workforce management (e.g. scheduling), 55% for talent management (e.g. performance management) and 39% for business intelligence related activities (Harris & Spencer, 2015).

Consultancy firms were the first to investigate whether the efforts invested into HRIS implementation projects were justified by the realization of expected benefits, but the results of these investigations are regarded as subjective (Ruel & Bondarouk, 2008). Academic scholars became involved only recently, thus there is a lack of empirical studies comparing envisaged vs realized benefits of HRIS, and what factors influence this translation (Parry & Tyson, 2011). This is especially true for research on information technology in health organizations (Engbersen, 2010), which has tended to prioritize clinical over administrative functions (Kivinen & Lammintakanen, 2013). HRIS in healthcare contexts is particularly interesting to study due the complexity of its governance, technological, and workforce structures (Evers, 2009; Bondarouk et al., 2009); and its comparability with IT 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 and Zell, 2001).

Strategic HR and HRIS

Organizations are increasingly acknowledging that their success and competitiveness depends almost “disproportionally on the performance of their HR” (Lippert and Swiercz, 2005). Back in 1997 Alvares stated that “The bottom-line business of human resources must be the delivery and/or development of human capital that enable the enterprise to become more competitive, to operate for maximum effectiveness, and to execute its business strategies successfully. Previous research has pointed to a difficulty in defining “strategy” in relation to HRIS, as this may be characterized differently in diverse bodies of work (Zisiadis, 2015). Nevertheless, the strategic importance of HR practices within organizations has been highlighted by many academic scholars (e.g. Ulrich, 1997), as well as consulting companies. The role of the HR profession has significantly evolved (SHRM, 2008) such that many routine transactional activities have been outsourced or automated to release HR professionals to focus on more complex tasks, such as employee talent management or organizational development strategies. Back in 1998 research on HRIS (Lepak & Snell, 1998) mentioned three main benefits that HRIS can offer to HR departments and organizations (strategic orientation, reducing costs and improving service delivery), while recent research has enriched these categories by adding the additional benefits of management empowerment, standardization (e.g. HRIS or HR processes) and improving organizational image (Parry & Tyson, 2011). However, HRIS scholars have noted that despite these lofty visions, organizations are being somewhat “silent about whether their HR departments have become more strategic” as a result of technology (Ruel & Bondarouk, 2008) and called for further examinations of HRIS outcomes (Strohmeier, 2007). The research reported in this paper is part of an ongoing programme of doctoral studies, including a cross-national comparison of HRIS implementation projects, informed by a systematic literature review on HRIS in health organizations (Tursunbayeva et al., 2015). The overarching aim of this research is to examine the processes and factors that characterise the development and implementation of HRIS in healthcare across different national (and institutional) contexts. Studying these processes is vital for understanding the ability of HRIS to realise their intended strategic objectives within the complex sociotechnical context of healthcare organisations.

Aims

To compare the expected benefits of introducing a new technological innovation – HRIS – to the actual outcomes and unintended consequences achieved, as well as the factors that impacted them (Parry & Tyson, 2011).

METHODOLOGY

Innovation, Setting and Selection

The HRIS implementation project under study is currently underway across all individual Regional Health Organizations (RHOs) within the country. 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. The HRIS system in concern was procured via the European Union tender process, and includes HR, Employee Relations, Self-service HR, iRecruitment, Learning Management and HR analytics modules. The subsequent implementation activities divided National Health Organization (NHO) across five phases of implementation, and the project was initially scheduled to take place between 2011 and 2015. We first studied the program at the national level (the wider unit of analysis) by interviewing stakeholders, who participated in the HRIS project development stage. We then examined eight RHOs in depth as embedded case studies, selected to represent a range of geographies and implementation phases, based on our analysis of project documentation and conversations with the program lead. Lastly, we interviewed one Line manager and one employee to obtain their user perceptions.

Design

We used a qualitative embedded case study approach (Yin, 2003) which 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). In this case, NHO is the largest unit of analysis, with selected RHOs as its sub-units. This embedded case study approach allows the study of HRIS project at the macro (NHO); meso (RHO); and micro (system users) levels. Comparison across the eight embedded units of analysis (the eight RHOs which were selected for in-depth study), provides opportunities to examine shared and context-specific themes (cf. Yin, 2003).

Data collection

The data was collected during summer 2015. Two methods of data collection were employed in this research: semi structured interviews (n=25) with key stakeholders (n=31) involved in the development and implementation of HRIS (see Table 1); and extensive documentation including both internal and publicly available historical information about the HRIS project. Interviews lasted 50 minutes on average (range 22-100 min) and were recorded, transcribed

verbatim and the transcripts sent to the respondents for verification and clarification where necessary.

Table 1. Interview Respondents

National Level	Interview Respondents	Number
National Project Team	National Project Team Respondents	3
eHealth Division	eHealth Respondent	1
Procurement Team	Senior Procurement Respondent	1
Vendor	Key project participants	2
System Supplier	Key project participant	1
Organizational Level	Interview Respondents	
RHO 1 (Small RHO; had HRIS)	Senior HR Executive	1
RHO 2 (Big RHO; had HRIS)	Senior HR Executive	1
RHO 3 (Small RHO; had HRIS)	Senior HR Executive	1
	Implementation Team Member	1
	HR Professional	1
RHO 4 (Medium RHO; did not have HRIS)	Senior HR Executive	1
RHO 5 (Special RHO with clinical staff; had HRIS)	HR Professionals	2
RHO 6 (Medium RHO; did not have HRIS)	Senior HR Executive	1
	HR Professionals	2
RHO 7 (Special RHO with non-clinical staff; had HRIS)	Senior HR Executive	1
	HR Professionals	4
RHO 8 (Big RHO; had HRIS)	Senior HR Executive	1
	Implementation Team Members	4
User Level	Interview Respondents	
RHO 7	Manager user	1
RHO 8	Employee user	1

Secondary data collection involved the analysis of the documentation relating to the project's development (e.g. tender documents), implementation (e.g. Gantt charts) and usage (e.g. end of pilot reports).

Data analysis

Data analysis was undertaken in four main steps, all of which made use of Nvivo qualitative analysis software package (Nvivo). It started from *Open coding* of transcripts in order to generate preliminary categories and themes. Secondly, building on the previous research, data related to HRIS *Expected Benefits* and *Outcomes* was coded either according HRIS benefits (Achieving Operational Efficiency; Improving Service Delivery; Standardizing HRIS or associated HR processes; Realizing Strategic Objectives; Empowering Managers; and Improving Organizational Image) identified in previous research (Parry and Tyson's, 2011) or

additional benefit categories for HRIS in health we identified in our systematic literature review (Compliance with the regulatory reporting requirements; Improving Patients Care; or Improving ICT Infrastructure). Data that did not fit into any of these categories was then grouped into separate category/ies. Finally, data related to *Reasons* why some of the expected benefits have still not been achieved were grouped into the appropriate categories, and factors that influenced these reasons were also classified according to the categories we identified in our systematic literature review on HRIS in health (Environmental, Intra-Organizational, Organizational, Individual, and Task, Technology or Project related).

These coding approach helped us to classify our data on *Expected HRIS Benefits, Outcomes and Factors of influence* according to the categories from generic HRIS and Health HRIS research, and to identify additional expected and realized benefits that emerged from our data.

PRELIMINARY FINDINGS

Expected benefits for HRIS introduction

Our analysis of the studied Nation-wide HRIS project suggests that it was driven by various expected benefits at different levels (see Table 2).

National Level

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 – that 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 strategic need to quickly respond to regular and ad-hoc Governmental requests for workforce data in uniform format across all RHO to enable the creation and implementation of effective workforce and health policies and confirm that they are compliant with the country legislations (e.g. on equality).

“A lot of that’s driven by the [Governmental] need for workforce information because when you’ve got an organisation of [such a size], albeit it in [numerous] organisations, you need to be able to manage that better and we need better information about it, we need better absence information, we need better information for equality, planning, planning workforce, so on and so forth and that drove the kind of need for a system like this.” (National Project Team Respondent 2).

There was also a long-term vision that by implementing nationwide HRIS, some of the most critical HR processes, such as recruitment, can be standardized and/or centralized. Overall, medical recruitment (process) has been identified by the Government as a critical priority to meet the demands for high quality health care delivery across all NHO. Consequently, the expectations 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, but it was efficient and could work quickly for both people applying for jobs but also people who were managing the process of recruitment.” (eHealth Respondent)

Another driver that triggered this countrywide HRIS implementation, was the benchmarking of NHO with NHOs in neighbourhood countries which were already in the process of implementing national HRIS, and/or moving towards HR shared services.

“I suppose if you look across industry, most large scale organisations would have an HR system and we didn't.” (Senior HR Executive, RHO 2)

Finally, the vision was also to empower managers and employees, by providing them the direct access to their data via the Self service module embedded into the procured HRIS.

“The whole point about [new system] is that every employee will use it.” (eHealth Respondent)

Table 2. Reported expected benefits

Level	Respondent Category	Operational Efficiency	Service Delivery	Standardization	Strategic	Empowerment	Statutory compliance	Patient Care	Organizational Image	Benchmarking
National	eHealth Respondent	✓		✓		✓	✓			
	National Project Team Respondents	✓	✓	✓						✓
	Senior Procurement Respondent	✓		✓						✓
	Vendor Key Project Participants									✓
	Project documentation	✓	✓	✓	✓		✓	✓		✓
RHO	Senior HR Executives	✓		✓	✓	✓	✓			✓
	HR Professionals	✓		✓		✓	✓			✓
	Implementation Team Members	✓			✓	✓				✓
User	Manager User					✓				
	Employee User									✓

Table 3. Reported realized benefits

Level	Respondent Category	Operational Efficiency	Service Delivery	Empowerment	Others
National	eHealth Respondent				
	National Project Team Respondents				
	Senior Procurement Respondent				
	Key Project Participants				
RHO	Senior HR Executives	✓		✓	
	HR Professionals	✓	✓	✓	
	Implementation Team Members				✓
User	Manager User	✓		✓	
	Employee User				

Organizational and HR Department levels

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] 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 vision was to have one standardized, national HRIS that would replace diverse systems used across the RHOs.

“It's ridiculous now that [NHO] don't have a single system that we can use. That just feels ridiculous now for [number of NHO staff] that we can't use one system and it always felt like that. It always felt kind of bitty.” (Senior HR Executive, RHO 1)

It was also promised that this single instance HRIS would be integrated into other national (e.g. payroll) and regional (e.g. rostering) systems. This supposed to eliminate the need for multiple data entry across various systems, streamline associated processes, and enable preparation of efficient and consistent statutory workforce reports.

“There was the promise of an interface with the payroll system so, again, that was going to be a big benefit in terms of, you know, reducing the amount of duplicate data input that was taking place.” (HR Professional 2, RHO 7)

Moreover, national HRIS system supposed to allow data sharing between all country RHOs, which could ease the intra-organizational transfers for health professionals and associated with it work for HR professionals (e.g. transferring employee record instead of creating 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 in the country], then we would be able to transfer data across.” (Senior HR Executive, RHO 3).

These expected benefits were very welcomed by HR executives and HR professionals, even those with advanced pre-existent HRIS, although all of the respondents from these RHOs benchmarked new system and its functionalities to their pre-existent systems.

“So, for us, in the whole of this project, we’ve come from a bit of a starting point with one or two other [RHOs] across [the country] who’ve also got systems, which is very different from an [RHO] that’s got no system, and are looking for their first system. So we’ve had a very different stance on the whole project, which is, we’ve got a system that’s working well and does what it needs to do for us. So we’ve always said that anything that replaces it has to be as good as, or better as... Or else it’ll be very difficult for us to sell to our managers that we’re moving to another system...So, hence, we’ve always had a different kind of perspective on where we were going to in terms of that.” (Senior HR Executive, RHO 8)

Other expected benefits of HRIS included, having all employee data in one place (e.g. on performance management and training) and giving all line managers access to customized information on their teams, and employees opportunity to update their data without the need for involving HR, which was foreseen as a way for enabling their efficiency and/or giving them a better control over their data.

“It was also benefit for managers in terms of that they can go into the system and see information that they would have needed to have requested via HR previously. Again, the same for employees, it’s one point to go in and actually be able to see information that’s held for you, it was to allow the sort of workflows in terms of so an employee could request say annual leave and the manager can approve it through the system so, you know, it was allowing that sort of approvals flow” (HR Professional 2, RHO 7)

This, consequently supposed also to reduce manual, administrative work performed previously by HR professionals, thus allowing them to focus on managerial and/or strategic HR practices.

“So the kind of benefits to a member of staff and the organisation in terms of resources and time was huge, specifically the learning management module that I’m dealing with again the benefits are huge because we’re releasing that training administrator from answering the e-mails, answering the telephone conversations because the member of staff can themselves take that responsibility and go in and choose the learning, choose the class they go on.” (HR Professional, RHO 3).

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.

“For us it is, I mean for those that are moving from one system to another it’s kind of just changing the processes of where they’re recording stuff...But for us it’s a huge, huge benefit because it’s not something we’ve had before. So that’s the benefit for us, quite huge for us in terms of releasing staff to do other things, taking kind of the weight of them, as I say balancing that load for us.” (HR Professional, RHO 3)

Manager and Employee level

Interviewed Line Manager, indeed, confirmed that the expected benefit for her and her team was to have a single instance HRIS that will record and maintain all staff information, so that they can focus on their primary job responsibilities instead of spending time on administrative tasks (e.g. inputting their information into various systems).

“So definitely I think in the future... you would have only area to go, staff would go into that area, they would see everything that they’ve done, the training, all the things. Why now you have to push them 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 1, RHO 7).

Interviewed employee was from the RHO with an advanced pre-existent HRIS. Therefore, benchmarking new HRIS with this pre-existent system, he reported that the main expected benefit for him was that “that [new system] will do more than the old systems used to do”.

HRIS Outcomes

Although it was initially scheduled to be completed in 2015, studied HRIS project is still in progress and our preliminary data analysis suggests that its development and implementation processes have been challenging for all of the involved stakeholders. Therefore, not all of the initially envisioned expected benefits have been attained yet (see Table 3), while the project has caused some unexpected consequences.

National Level

None of the respondents reported any realized benefits at NHO level at the time the interviews were conducted.

Organizational Level

Four RHOs (3,6,7&8) reported some realized benefits at the time when interviews were conducted.

Thus HR Professionals from RHO 6 and 7 reported that the new system contains better quality information, and that they and Line managers in their RHOs are benefitting from the reports they can generate from it.

“I think, for me, the best thing is the reporting. You get a lot of good reports out, and you can set up different ones for managers to run themselves.” (HR Professional 1, RHO 6)

HR Professional from RHO 7 also reported that the new system has been set up to require less approvals (e.g. 3 instead of 4 approvals) compared to their pre-existent paper processes, thus it was perceived to simplify and speed up HR related processes and reduce bureaucracy.

“I think in terms of the functionality that we’re using, certainly things -, there is less bureaucracy in terms of things like that, so whereby a manager used to fill in a form and it would have go round the houses and, you know, you would have to get everyone to manually sign it, I think it’s certainly more effective or less bureaucratic, so that’s definitely helped.”

Other mentioned realized benefits were related to standardization of advertised by RHO job announcements, and marginal time and paper savings. Finally, members of HRIS implementation teams from RHO 3 and 8 also reported, such benefits of this ongoing project as *“keeping them on the job”* or that their RHO had business benefit from seconding them to other RHOs who are still in the process of HRIS implementation.

“So I guess that’s a benefit, I mean, we’ve got some business out of it by myself now reporting for [different RHO], you know, we’re getting a little bit of funding into our department to that, so that’s a benefit.” (Implementation Team Member, RHO 3)

However, HR Executives and HR Professionals from four RHOs (3,4,5&7) also suggested that the HRIS implementation project caused more work for their HR Professionals.

“I think there’s been a significant workload increase for HR and the recruitment team.” (Senior HR Executive, RHO 7)

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) that, according to HR Executives from RHOs 3&4, affected the level of the service that HR departments provide to internal customers.

“It had an impact on the rest of the service we were able to offer or are able to offer as an HR function because staff have taken away from the day-to-day job to be involved in it and still are.” (Senior HR Executive, RHO 3)

Some HR Executives and Professionals (RHO 4&7) were also concerned that this phenomenon, together with the system technical and functionality issues, especially with the new recruitment module, will affect the reputation of their HR Departments, as well as the reputation of their RHOs and NHO as an employer in general, as candidates having problems with it, might not re-apply for future jobs.

“We have a potential reputational risk when you look at the external candidate and if you went onto the website to apply for a job you'll see what I mean by it, it's not user friendly, it takes a lot of time, data's getting lost and just not a good, quick experience for individuals who may then choose not to apply for future jobs.” (Senior HR Executive, RHO 7)

User Level

Interviewed manager was very positive about realized benefits, which she summarized as 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.

“And I did say to HR that I liked it when I used it and I used and shortlisted people and I could shortlist them after the interview. I liked that automatic approach. I hate forms. I hate completing a number of forms and, I don't know how, but this transgressed a bit and we are now back, as I've heard, using forms, and I did tell them ‘but I liked the system because I didn't use the forms’I also think it is a lot easier now to identify [information] which you couldn't see before, so now you have information about a person but you also have information of what kind of contract they're under, so you go, you press their name and you can see their salary number., you can also see what kind of contract: permanent/secondment/fixed term, but it's actually making a difference.” (Manager User, RHO 7).

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

“If HR is involved and they want to control particular areas of the system, what I found is if I was left alone to do it by myself, I might have done it faster than HR stopping me and telling me ‘you have to do that’ but then I am controlling it and I'm going to do this on top of that so that then it finishes. I found that restrictive but then I'm one of the managers that really would like to do things Online, I don't think if you ask somebody else that they would say that and I have noticed that HR have put a lot of controls so that probably mistakes don't happen, I think that's why. For me, that's being -, that's taking a step backwards because if you have

decided to actually let the system to be automated, just let it go, let [us try it]”. (Manager User, RHO 7)

Although some HR professionals reported that users liked that they could add/change their personal details in the system, interviewed user did not report any realized benefit at the time the interview was conducted.

“We had some positive comments back about some other aspects of it, people can change personal details and look at information on-line and they can see reports and there’s more functionality there.” (Senior HR Executive, RHO 7)

Factors Affecting Realization of Expected HRIS Benefits

Interviewees reported five main reasons why the strategic expected benefits of this project are still not achieved at regional and national levels. However, as the project is very complex, there are many socio-technical factors that impacted on these reasons. In fact, we evidenced in this project all of the factors of influence we identified in our systematic review on HRIS in health.

- HRIS will have up-to-date information (Reported by: RHO 6)

Data migration has proven to be particularly challenging, labour intensive and time consuming process due to various sociotechnical factors: 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 (*Project*); NHO requires to record extensive employee information, for example, skills and qualifications of people (*Environmental*); new HRIS is still not interfaced with the national Payroll system (*Technology*); Created data migration process is very long, and stakeholders are highly interdependent (*Intra-Organizational and Individual*).

Factors of influence: Environmental, Intra-Organizational, Individual, and Project and Technology related.

- HRIS will be connected with other national and/or regional workforce and/or health systems (Reported by: RHO 1,3,6,7,8)

Integration had proved to be another challenging exercise, as the systems (*Technology*) were not fully compatible, nor were the teams supporting these systems (*Individual*) able to prioritise the interfacing with the new HRIS.

Factors of influence: Technology and Individual.

- HRIS will be used outside of HR departments (Reported by: RHO 2,3,5,7)

The system cannot be rolled out to managers and employees because the data has still not been fully migrated (*Project*) and because of HRIS technical and functionality issues (*Technology*).
Factors of influence: Project and Technology related.

- HRIS will be used by all RHOs (Reported by: RHO 3,8 & National Project Team)

Challenging data migration and systems' technical and functionality issues (*Technology*) reduced users' and individual RHOs' confidence in the system (*Individual and Organizational*). Thus some RHOs started withdrawing from or not engaging into implementation activities, and requesting more evidence from the national project team that the system is fit for the purpose.

Factors of influence: Organizational, Individual and Technology related

- All HRIS modules will be used; especially recruitment (Reported by: RHO 2,6);

Most of our respondents, be they developers, implementers or system users, perceived that the operating logic embedded into the system (*Technology*) were clashing with the norms, values and practices that characterized their own, public sector and European context of use. In particular, recruitment module received the biggest criticisms, as its way of working was found to be specifically incompatible with studied NHOs' recruitment practices and procedures in particular, and more generally with the overall public sector practices (*Environmental*). Following numerous RHOs' complaints, significant time, effort, and resources were invested into configuring various modules of this off-the-shelf system to better suit studied NHOs' working procedures and practices (*Task*), which were not fully standardized prior to the system introduction. This prolonged configuration process led to negative consequences on the system's performance, and further delays in the implementation process, as any such configuration often raised the question as to which RHOs' best practice should be followed when adapting the system. On a positive note, this process of configuring the system opened up the dialogue between RHOs on reconsidering their operating procedures, and triggered an opportunity towards standardizing NHO' HR practices. This was widely perceived by the central team as actually a significant step forward towards the vision for transforming national HR operating framework and for creating the model of shared services across NHO HR envisaged in the Government's political discourse

Factors of influence: Environmental, Technology and Task related

Moreover, we also identified that all of the identified factors of influence are highly interconnected. Thus, they did not only affect various project activities, but also continuously influenced and shaped each other. For example, NHO's existing procedures and practices

(Task) that individuals followed in their daily jobs (Individual) caused adaptations to technology (Technology) to suit them, which delayed the project (Project) and had an impact on the amount of work the vendor (Intra-Organizational) had to perform related to this project. While the system (Technology), also triggered the change in the pre-existent working practices (Task) within an organization, consequently affecting individuals work (Individual) and generating the resistance to change.

DISCUSSION

Our analysis, although still ongoing, identified a wide range of expected benefits that drove this national HRIS project. Thus we evidenced all benefits categories identified in previous HRIS research (Parry and Tyson's, 2010), except the expected benefit for improving organizational image. This proposed that HRIS implementation in health organizations is driven by similar expected benefits to those driving implementation on other types of organization. However, they are also driven by particular requirements of the health sector, such as achieving adherence with statutory health workforce reporting requirements (e.g. Waring, 2004; Waters, Zuber, Willy, et al., 2013) and optimising patient care (e.g. Thouin, 2009; Spaulding, 2012). Moreover, we identified an additional benefit that drove the studied HRIS project, which we classified as *Benchmarking*. Thus, for example, respondents at national level were mentioning that NHO compared its processes and/or HRIS to those of who is considered industry leaders, which in this case were neighbourhood country/ies already in the process of HRIS implementation (Dugas, Eckholt, & Bunzemeier, 2008), with the aim to improve them. This is actually one of the core attributes of the Learning Health Systems principle, which promotes continuous evidence-based improvement and innovation (Smith, M., Saunders, R., Stuckhardt, L., & et al., 2013), and thus being followed by many health organizations and health systems. We also observed benchmarking at the level of individual RHOs (e.g. RHOs without pre-existent HRIS were comparing themselves to the RHOs with advanced HR systems), and users (e.g. users comparing the functionality of their pre-existent HRIS to the functionality in new system).

In this multi-site HRIS programme however the benefits are most likely to derive not from the direct effects expected from the system but as a result of the various organisations involved achieving consensus on the need to standardize their hitherto diverse HR information practices in order to accommodate the system, as a pan-organizational national solution. Our analysis also unveils a range of sociotechnical factors that shaped the implementation of this nationwide HRIS, and affected the realization of its envisaged strategic benefits, including Environmental,

Intra-Organizational, Organizational, Individual, and Project, Technology, Task related factors. Thus, we expand significantly the list of factors that were evidenced by previous research (Troshani, Jerram & Hill, 2011) to influence public sector HRIS projects (environmental, organizational and technological), which can suggest that nationwide HRIS projects in health context are particularly complex.

CONCLUSION

This HRIS project, although still in progress, has been challenging for all involved stakeholders, which is in line with the outcomes of other large-scale HRIS implementations (Kavanagh, 2012), and HRIS projects in health organizations (Thite, 2014). However, despite the delays and difficulties encountered, our data suggests that it can also offer tremendous opportunities for the NHO to reconsider and reconfigure their existing HR processes, which have been highly variable and, in many cases, suboptimal. The experience of engaging in the consultations surrounding the project, considering the work-arounds required by the new system and negotiating common requirements, has allowed individual RHOs to begin to consider changes in their current working practices, as well as to agree the type of system that would enable alignment among the RHOs with a set of standard working practices. Therefore, the main benefit from this project are likely to arise not from the implemented system or its modules, but from the redesign of standard operating processes which has accompanied the implementation, and which has required a significant investment of time and effort from project stakeholders across all studied NHO.

Although the implementation of this system is still in process, we felt that it is highly beneficial to conduct this evaluative assessment of the project's expected and realized benefits now, as (a) to demonstrate that although the project is challenged by various interconnected sociotechnical factors, some stakeholders already reported seeing initial benefits from this project; and that actually in this multi-site HRIS programme the benefits are most likely to derive not from the direct effects expected from the system but because the HRIS project acted as a catalyst for greater consensus on the need to standardize HR information practices; and (b) to understand the reported project benefits at this point in time, as this study has a potential to become longitudinal.

Based on our empirical evidence for the reported expected and realized benefits of large-scale HRIS project in Health, as well as factors that influence them, the study adds to the interdisciplinary literature on HRIS in health organizations by addressing gaps in (a) studies of large-scale transformations in healthcare; (b) studies of national-scale HRIS projects; (c)

empirical comparisons of expected benefits and outcomes, and factors influencing them; (d) and demonstrations of HRIS programme benefits at different organizational and institutional levels.

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