Collaborative Governance for Longitudinal Healthcare Services: Enabling Conditions and Leading Practices

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Abstract

Coordination has to do with the linking together of organizations, managing the interdependencies among them (Malone and Crowston, 1994; Longest and Klingensmith, 1997). In healthcare, coordination is influenced by the complex nature of the system as well as by the plurality of actors involved. In particular, the most cited determinants of complexity include the opposing interests of stakeholders, the division of labor in the different levels of governments, the active role of private parties such as providers, insurance and pharmaceutical companies, and private regulatory organizations (Field, 2008). In such a context, coordination mechanisms are subject to vertical influence by the institutional frameworks adopted at country level in order to govern the healthcare system as well as by all the actors taking part in the policy process. Horizontally, all the healthcare providers and stakeholders that play an active part in healthcare processes are actors in the system.

The paper analyses practices in terms of coordination (Bouckaert et al., 2010 and Ongaro, 2009) and discusses the introduction of a regional healthcare information system supporting the creation of Electronic Patient Records (EPR) in the Italian regions of Lombardy and Veneto. The EPR is a longitudinal electronic record of a patient’s healthcare history. This is in itself a coordinating tool for healthcare providers. Whilst the ultimate impact of an EPR may be disputable, it is usually considered as being potentially extremely beneficial for the improvement of healthcare services in terms of their quality, effectiveness and possibly efficiency.

The purpose of this paper is to depict the coordination and governance mechanisms that have emerged during the implementation process of an EPR system at regional level in two separate contexts, and aims to describe the main characteristics of the project in order to explore and analyze it. The adoption of a shared information system linking the multiple providers involved in the delivery of healthcare processes to a patient throughout their life is considered fundamental in order to ensure continuity of care and enhance the effectiveness of healthcare systems by means of more integrated processes (Askim et al., 2011; Ongaro, 2004). At the basis of such a system is the creation of a life-long electronic patient record that embeds any relevant events and information linked to a patient’s healthcare history. Since this process affects many stakeholders and variety of interests of the different players, it represents a complex policy and process innovation that requires great effort for its coordination.

The paper is organized as follows: we first examine the relevant literature in order to define a theoretical framework for our analysis before providing a short description of the methodology adopted. We then present the cases, giving a brief background of the Italian Healthcare System and the reforms that have affected it in recent decades. We subsequently focus on the contexts in our analysis (i.e. the Italian regions of Lombardy and Veneto) and illustrate the coordination practices employed during the setting up of their EPR systems, discussing the mechanisms put in place to implement it and drawing some indications about the enabling conditions and the lessons learnt.

Keywords: coordination mechanisms, Electronic Patient Record, enabling conditions
Introduction

The aim of this paper is to analyze the coordination and governance mechanisms existing among the actors involved in adopting a regional healthcare information system, aiming to provide a description of the main characteristics of the project in order to explore and analyze it.

The adoption of a shared information system linking the multiple providers involved in the delivery of healthcare processes to a patient throughout their life is considered fundamental in order to ensure continuity of care and enhance the effectiveness of healthcare systems by means of more integrated processes (Askim et al., 2011; Ongaro, 2004). At the basis of such a system is the creation of (ideally) a life-long electronic patient record (EPR) that embeds all relevant events and information linked to a patient’s healthcare history. Since this process affects many stakeholders and variety of interests of the different players, it represents a complex policy and process innovation that requires great effort for its coordination.

This paper examines two coordination practices with regional scope. The regional level has played a key role within the Italian National Health Service (INHS) in terms of policies, strategies and planning since the healthcare reform began in 1992, delegating considerable responsibilities to regional governments, although the INHS remains a single and unitary system, at least in legal and institutional terms.

The cases analyzed in this study concern the implementation of EPRs in the Italian regions of Lombardy and Veneto, considered two of the most virtuous regions in the country as regards the quality of the healthcare services they deliver.

The paper aims to depict the main characteristics of the two projects in order to explore and analyze the coordination mechanisms that took place during the implementation process. In particular, the cases highlight and discuss the coordination practices and tools employed in the four phases of the implementation. It discusses the different forms of coordination by drawing some indications about the enabling conditions, the leading practices and the critical issues encountered by the two projects.

Literature Review

The studies selected for this review focus on coordination in public sector organizations and more specifically on the structures and mechanisms used to implement it. Three main databases were used to search for relevant research studies. These databases include Ebsco, Jstore and Emerald. Our search strategy was designed to concentrate on the public sector, starting from an overview of coordination mechanisms in public sector organizations and culminating in an in-depth focus of coordination mechanisms in the healthcare sector.

First of all according to Mosely and James (2008) “collaboration is a strong form of coordination with coordination a broader concept and possible without proactive attempt by the bodies involved (for example, when it results from autonomous action by actors in markets reaching equilibrium”). Based on this, we focused on coordination associated with the linking together of organizations, managing the interdependencies among them (Malone and Crowston, 1994; Longest and Klingensmith, 1997). Bouckaert, Peters and Verhoest provide a definition: ‘[T]he bringing into relationship of otherwise disparate activities or events and the enhancement of compatibility of tasks and efforts, in order to achieve something which otherwise would not be’ (Bouckaert et al., 2010).

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1 Whether integrated processes necessarily imply higher effectiveness and quality is, of course, disputable
Some studies focus on the “proceduralization” of models in terms of the coordination mechanism (Bouckaert 2006), in which the main aspect is that “cooperative solutions are required, not only in the form of cooperation between governments but also through cooperation between governments (centrally, regionally, locally), civil society associations and other stakeholders such as the media and business”. Some authors (Bouckaert et al., 2010, and Ongaro, 2009b) identify two main types of coordination: vertical or horizontal. ‘Vertical’ mainly refers to coordination taking place between entities located at different levels of government, ‘horizontal’ refers to coordination occurring at the same level, primarily the service-delivery level.

The forms, logic and mechanisms of coordination have been described in public sector literature (Bouckaert, Peters and Verhoest., 2010; and Peters, 1998 - drawing especially on Thompson, 1991). At the vertical level, hierarchy-type mechanisms (HTM) based on rules, formal hierarchies and high degrees of formality, and market-type mechanisms (MTM) aimed at sustaining specific behavior by means of incentives for the actors involved, are quite typical of this field. Network-type mechanisms (NTM), based on shared information, knowledge and consultation, are a main (but not exclusive) element in horizontal relationships between the actors involved in public activities.

**Collaboration in the healthcare sector: the analysis framework**

In healthcare, coordination is influenced by the complex nature of the system as well as by the plurality of actors involved. In particular, the most cited determinants of complexity include the opposing interests of stakeholders, the division of labor at the different levels of governments, the active role played by private parties, such as providers, insurance and pharmaceutical companies, and private regulatory organizations (Field, 2008). In such a context, coordination and governance mechanisms are subject to vertical influence by the institutional frameworks adopted at country level in order to govern the healthcare system as well as by all the actors taking part in the policy process. Horizontally, all the healthcare providers and stakeholders that play an active part in healthcare processes are actors in the system.

As mentioned, multiple and conflicting organizational and individual goals and preferences may shape the nature and forms of coordination found in the healthcare sector. In addition, quality-related objectives, such as continuity of care, the adoption of service level agreements and the integration of healthcare processes by different types of providers, offer stimuli for coordination (Lega, 2002). From a more vertical outlook, the attempt to balance roles between the layers of governments involved in the healthcare system also requires coordination (Longo, 2003).

Often, regulatory actors are mainly concerned with vertical coordination, namely coordination across levels of government, whereas healthcare providers involved in the delivery of healthcare are more readily affected by horizontal coordination at service delivery level. Thus, vertical coordination occurs between regulatory agencies in charge of defining healthcare policies and strategies, and providers operating in a given territory. The forms, logic, mechanisms and tools of coordination described in public sector literature can be found in the healthcare sector with some adaptations to fit the extant context in the way they are combined and applied. At vertical level, hierarchy-type mechanisms (HTM) and market-type mechanisms (MTM) are generally found when ‘Diagnostic-Related Group (DRG) funding mechanisms are in place. Furthermore, network-type mechanisms (NTM) are especially typical of horizontal relationships among people involved in healthcare activities (framework adapted from Bouckaert et al., 2010; see also Ongaro, 2008 and 2009b - see figure below).
Figure 1 - General coordination mechanisms in healthcare: an overview.

<table>
<thead>
<tr>
<th>Underlying principle</th>
<th>HTM</th>
<th>MTM</th>
<th>NTM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rules</td>
<td>Result-orientation</td>
<td>Knowledge-sharing</td>
</tr>
<tr>
<td>Implementation tool</td>
<td>Hierarchy</td>
<td>Incentives</td>
<td>Consultation</td>
</tr>
<tr>
<td>Degree of formality</td>
<td>High</td>
<td>Medium/Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: adapted from Bouckaert et al., 2010.

Lega and Longo (2002) offer a framework that depicts the multiple roles that a regional government may cover when governing the regional healthcare system (See Figure 2). Different roles depend on contextual characteristics, such as the complexity of the system and the degree of trust between the regional government and healthcare providers, as well as more structural characteristics, such as the financial sustainability of the healthcare system and investments in knowledge development.

Figure 2 - Vertical coordination in healthcare: the role of regional governments

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Authority</th>
<th>Regulator</th>
<th>Strategic</th>
<th>Operative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>High</td>
<td>Medium-High</td>
<td>Medium</td>
<td>Instable</td>
</tr>
<tr>
<td>Size and complexity of the regional healthcare system</td>
<td>High</td>
<td>Medium-High</td>
<td>Medium-High</td>
<td>Low</td>
</tr>
<tr>
<td>Financial sustainability of the healthcare system</td>
<td>Good</td>
<td>Risky</td>
<td>Difficult</td>
<td>Negative</td>
</tr>
<tr>
<td>Knowledge development and diffusion</td>
<td>High</td>
<td>Medium-Low</td>
<td>High (region) Medium (providers)</td>
<td>High (region) Low (providers)</td>
</tr>
</tbody>
</table>

Source: Adapted from Lega and Longo (2002)

If the regional government adopts an authority-type role, it sets rules for the competitiveness of the regional healthcare market and gives healthcare providers a high degree of autonomy for the formulation and implementation of strategies. By adopting a regulatory role, the region defines rules and goals for each public healthcare provider and monitors results. It may also play a strategic role by intervening in the defining of plans by public healthcare providers, monitoring the implementation of their activities or even deciding the goals and the tools providers (operative role) should use in order to achieve them, if the healthcare system is characterized by challenges in terms of sustainability and trust (Lega, 2002; Lega and Longo, 2002; Longo, 2003). This has implications on the types of coordination mechanisms that come to be required. Authority-type and regulatory roles of the region are not likely to display HTM on a vertical level, whereas this may be the case for MTM and NTM on a horizontal level. On the contrary, the regional government taking a more interventionist role when managing the healthcare processes provided by healthcare providers is more typical of stronger HTM coordination on a vertical level.

In the case of the development of a regional EPR system to support continuity of care and pursue other strategic goals at regional level, the overall interdependencies occurring between the regional government and the healthcare providers may re-shape the overall coordination...
mechanisms within the system. This paper initially depicts the characteristics of the Italian healthcare sector and then describes the context of the Italian regions of Lombardy and Veneto that have introduced EPR systems. It subsequently discusses the forms of mechanisms put in place in order to implement them. In order to pursue these goals, the paper focuses on structure and the roles of the actors involved in the project. The paper finishes by identifying any enabling conditions that may be deduced from the two cases as having led to the development of a regional EPR project.

Methods

Given the aim of identifying which coordination and governance mechanisms are in place, we investigated “how” and “why” coordination practices are contrived. The design of the research based on case studies thus aims to address “how” and “why” questions (Yin, 2009). Moreover, by using a case study, we can observe and analyze phenomena not only individually but as an integrated whole (Bullock, 1986). This is a proper approach when investigating complex phenomena such as coordination practices for innovation in the healthcare sector.

The two Italian regions in our analysis, Lombardy and Veneto, were selected as the result of a combination of reputational and ‘opportunistic’ reasons: they are two of the most innovative regions as regards healthcare delivery patterns in Italy and both had started the implementation of an EPR system in a systematic manner when this paper was being completed (fully introduced in the case of Lombardy).

Data collection was based mainly on interviews and document analysis. A detailed analysis of publicly available data was conducted; documentary analysis was based on the organizations’ rulings, reports and documents related to the design and implementation of the health- and social care information system project (Bruyman, 2009).

Semi-structured, in-depth interviews were used as a second method of data collection in the case study setting, since they “can get close to the social actors’ meanings and interpretation, to their accounts of the social interaction in which they have been involved.” (Blaikie, 2000).

The interview process started with an introductory themed interview, designed to get a general idea about the project and the regional context and determine which actors were involved in the health- and social care information system project or were affected by it.

Further interviews were conducted with a more structured approach, aiming to identify the different kinds of collaboration mechanisms and tools used. For this reason, the interview format contained specific questions as to the management instruments and structural instruments used during the coordination process (Bouckaert et al. 2010, Ongaro 2008 and 2009b).

Data was classified and analyzed according to the analysis framework previously identified (Bouckaert et al. 2010, Ongaro 2008 and 2009b), based on the threefold classification of coordination instruments according to the underlying coordination logic, namely: Hierarchy-type Mechanisms (HTM), Market-type Mechanisms (MTM) and Network-type mechanisms (NTM).

A “multiple method” strategy was selected as the research method for the analysis of this case study for several reasons:

• it offers greater research validity by using different methods to check findings (Read and Marsh, 2002);
• it is “capable of providing a more integrated picture of a phenomenon” (Hantrais, 2005);
• it enables “a deeper understanding of complex social phenomena and produces much more accounts of social reality” (Bryman, 2008).
The two case studies

Overview of the health care system in Italy

The Italian National Health Service (INHS) was established in 1978 and underwent extensive reform in 1992, delegating the formerly centralized role of defining priorities and goals to the Regions. It is financed by general taxation and provides universal coverage and free healthcare to all Italian and European Union citizens residing in the country, as well as to all people (non EC nationals) who have a valid permit to stay in Italy.

Its organization has been divided into three levels since it was first set up: central, regional and local levels.

The Constitutional Reform of 2001 brought about a major change to the INHS, when regions were given regulatory authority for healthcare issues in their area, with regard to the basic principles and levels of assistance defined at national level.

At central level, the Ministry of Health currently formulates a three-year National Healthcare Plan (NHP), setting down the priorities to be addressed in order to pursue national interests and goals as regards public healthcare. At local level, Local Healthcare Authorities (LHAs) offer hospital care, outpatient and primary care services for the local area, and Public Hospitals (PHs) deliver inpatient care services. LHAs are public, as are PHs and social care providers. The latter can be controlled by the LHA or by the local municipality. Additionally, at regional level, the Healthcare Department may sign agreements with private healthcare providers enabling them to deliver part of their public care services on a reimbursement fee basis.

In parallel, a systemic revolution has taken place since the regionalization of healthcare at the beginning of the 1990s, shifting the principles and logic of the healthcare system from the predominance of the administrative law paradigm, based on compliance with regulations and formal procedures, to the emergence of a managerial paradigm, centered on the criteria of efficiency, quality and effectiveness. In light of this change, LHAs, PHs and other public healthcare providers have been introducing managerial tools and are governed by a results-oriented Chief Executive Officer appointed by the Healthcare Department on a temporary basis.

Institutional and technological timelines should also be considered: most investment in ICT by healthcare providers occurred – for inherent reasons of technological development - after the 1992 reforms. Individual organizations – LHAs or PHs - have been leading the development of information management systems, at first at individual organization level and subsequently spinning off to comprise information management at regional healthcare level.

More recently, the Italian Ministry of Health published guidelines in 2010 requiring all regional governments to adopt an Electronic Patient Record system within 2012 (Ministero della Salute, 2010). The recent National Digital Agenda Law reiterates that this innovation is a priority in order to successfully meet public healthcare goals, support healthcare planning and delivery, and contribute to advancements in biomedical studies (D.L. 179/2012). This has two implications: on the one hand, it provides the input – almost dictating – whereby all regional governments must implement EPR systems in an autonomous but interoperable manner. On the other hand, it arrives late and may force the deployment of innovations already undertaken by virtuous regions, which had already engaged and (in a few cases) implemented a regional healthcare information system in view of their autonomy.

The two Regional contexts

In the regional context, patients receive healthcare from different providers and physicians. In order to provide a good standard of patient care, it is essential that healthcare processes are carried out in a coordinated manner. The basis for coordination and continuity of care is information, which
should be shared by all providers in order to ensure more efficient decision making (diagnosis and treatment) and more effective care.

**Healthcare in Lombardy**

The northern Italian region of Lombardy is 24,000 km², divided into 12 provinces with 1,544 municipalities (2012 data). Lombardy is the most populous region in Italy with over 9.8 million residents, representing about 16% of Italy’s entire population, and is also the most densely populated (411.81 inhabitants/km² compared to the national average of 200.26 inhabitants/km²). The region produces around 20% of Italy’s GDP.

During the period we observed the implementation of the EPR, the regional healthcare system had quite a stable institutional format based on two fundamental reforms: the first one in 1997-1998 and the second one in 2002-2003 (Ferrè, Lecci et al., 2011). The first reform (1997-1998) was introduced by the regional government to redefine the number and roles of public healthcare providers, reducing them so they served larger geographical areas and separating program design from service delivery. As a result, the regional healthcare model became based on the total separation of roles and this is still the case at the time this paper was completed: with the exception of one LHA, local healthcare authorities (LHAs) only govern institutional services related to public health, prevention, primary care and outpatient activities, whereas public hospitals (PHs) and private providers deliver acute care services.

The healthcare system in Lombardy currently has 128 public and private institutions, including 29 public hospitals (including 9 teaching hospitals) and 15 LHAs, generally established on the basis of provincial territories (Italy has a two-tier local government, with the upper tier being the provincial level). The Metropolitan Area of Milan and the Province of Brescia are exceptions to this, as more than one LHA has been established to cater for the population density and the size of the territory. Furthermore, there are 27 Scientific Hospital Institutes (IRCCS), (21 public and 6 private), which have the contemporary presence of biomedical research and mass delivery of care services. There is also a strong presence of private healthcare providers: 30% of hospital admissions take place in private hospitals (the Italian average is 23% - 2010-2011 data). Data also shows that Lombardy has one of the highest rates of private hospital patients coming from outside the region (51% of patients in active mobility in Lombardy is turning to private accredited providers instead of using the region’s public healthcare system).

Healthcare planning relies heavily on centralized goal setting at system level. These goals are operationalized and aligned in administrative orders and the organizational goals of healthcare providers are implemented mainly by resorting to HTMs. Each LHA and PH is assigned term-based objectives for which the CEO is fully responsible. The appointment of the CEO of a LHA and PH is also a task undertaken by the regional government (and may take the form of a trustee-type relationship).

Since the major reforms in 1997-1998, the Healthcare Department has considered healthcare information management to be a core pillar in its overall strategy for the healthcare system. In 1999, the Healthcare Department launched a visionary program for the development of a regional healthcare information system based on smart card access and services (*progetto CRS-SISS carta regionale servizi – sistema informativo socio-sanitario*). This project embedded the idea of establishing region-wide ICT architecture in order to share healthcare data at inter-organizational level across the region, connecting all the stakeholders involved in the project. Lombardy recognized that integrating all the healthcare providers (i.e. LHAs, PHs, primary care centers, pharmacies and general practitioners) is fundamental for the regional healthcare strategy in order to ensure continuity of care.

At the same time, LHAs and PHs have been addressing their own organizational needs to share administrative information and eventually grant inter-organizational continuity of care. In particular, they have been rationalizing their management information systems to support financial transactions and the majority ultimately engaged in the introduction of an Electronic Medical
Record (EMR) system, with different results, in order to achieve intra-organizational continuity of care and longitudinal access to past events listed in a patient’s records.

Lombardy works with Lombardia Informatica SpA (hereafter LISPA), a regional in-house ICT supplier founded in December 1981, for its ICT innovation program. LISPA operates in two main business areas: the development, management and maintenance of the region’s information system and e-health projects sponsored by the regional government. The coordination mechanism that governs the relationship between the regional government and LISPA is typical of HTM, although they negotiate goals, projects and results on a yearly basis. Furthermore, the Regional President is the appointing authority of LISPA’s CEO.

Healthcare in Veneto

The region of Veneto is in the north-east of Italy and has an area of 18,398.85 km². It has about 5 million inhabitants, accounting for about 8% of Italy’s total population.

The regional government provides healthcare and social services to the resident population via LHAs and public- and private accredited hospitals. The healthcare system in Veneto is made up of:

- 21 Local Healthcare Authorities (LHA);
- 2 public hospitals and 2 research hospitals;
- 1076 primary care service providers;
- 3600 General Practitioners;
- 250 residential homes for the elderly.

Veneto’s average annual healthcare expenditure is estimated at €8.5 billion.

The coordination of Electronic Patient Records began in the early 2000s in Veneto.

Some LHAs started a process to introduce an Electronic Medical Record (EMR) system at organizational level, involving Veneto’s Regional Healthcare Department in order to put coordination mechanisms in place and ensure the convergence of the different EMR implementations to enable the sharing of information throughout the region.

The objective of regional coordination is to introduce a Regional Electronic Patient Record System, providing healthcare providers with access to all patient data originating within the region. A first step was to introduce technical standards for Electronic Medical Records in 2007, although there was no firm regional commitment to the development of an EPR system until a new Regional President (governor) took office in 2010.

For this reason, in 2007, the twenty-one LHAs and the two PHs decided to work together to achieve coordination with regard to ehealth by creating a consortium in order to share information about their projects and agree on joint technical guidelines to achieve information sharing and general coordination of ehealth.

The consortium was originally founded in 2005 to work on telemedicine projects, and was given a new configuration in 2007 so it became a hub for use by healthcare providers in Veneto to pursue improvements to healthcare processes and promote collaboration between the various organizations.

After the regional elections in 2010, the newly elected government confirmed its intention to introduce a regional EPR system, building on existing EMR systems. Veneto’s Healthcare Department realized that their previous efforts to establish an interoperable regional healthcare
information system had been rather ineffective, mainly due to a lack of coordination. Consequently, they decided to pursue regional eHealth objectives by exploiting the collaboration with the consortium.

In December 2010, the Healthcare Department issued a regional ruling, setting down seven specific objectives for healthcare IT so that an EPR system would be implemented within 2012. The Regional Healthcare Plan for 2012-2014 also confirms the commitment for a regional ERP system.

Lombardy’s project for a regional healthcare information system

The collaboration practice described consists of a set of coordination mechanisms employed in order to introduce the healthcare information system project, embedding the adoption of an Electronic Patient Record system. As mentioned above, Lombardy undertook major reforms to its healthcare system at the end of the 1990s. Its main goal was to mitigate its soaring healthcare expenditure due to the previous configuration of the delivery of healthcare services by introducing a major reengineering program for its healthcare system based on downsizing the number of providers whilst providing funds to improve the efficiency and quality of care. In order to support this major reform process, its Healthcare Department decided it was vital to introduce a support tool in the form of a regional health- and social care IT system to facilitate healthcare process integration for all providers. In turn, this project aimed to enable all providers to share, gather and manage information relating to a patient’s healthcare history originating in any of Lombardy’s public or private healthcare providers. Access to the information was to be available to all healthcare professionals and administrators connected up to this regional information system, subject to appropriate identification and the explicit consent of the patient via a smart card or a virtual PIN.

The four main objectives of the electronic patient record system were stated as being the following:

- Improving services for citizens: reducing the “distance” between citizens and healthcare providers by simplifying procedures and shortening waiting times (i.e. e-booking, on line EPR access, e-prescriptions);
- Improving the quality of prescriptions, diagnosis and care (appropriateness) processes by sharing a patient’s clinical data between qualified healthcare professionals via the EPR, while safeguarding the patient’s right to privacy;
- Improving the governance of the health- and social care system by controlling costs, enhancing planning and controlling instruments (i.e. by adopting business intelligence tools);
- Improving the internal operating efficiency of healthcare service providers by means of the generalized adoption of new technologies (i.e. digital signatures, electronic filing, electronic prescriptions) and dematerializing documents.

The project to put a health- and social care information system in place was implemented via a process that can be described as unfolding in four phases. Each phase offers interesting evidence as to the coordination mechanism, the actors involved in addition to their role in the project. The first phase (1998-1999) was designing the new regional social and health care information system (1999-2001). The second stage was the pilot phase, after the innovation was designed and the prototype information system was tested and implemented at Lecco LHA (a medium-size city in the north-west of Lombardy). The third stage (2002-2009) was the extension phase when the project, based on the positive results found during the testing stage, was implemented at regional level; the last stage (2010 – ongoing) is the project’s consolidation phase when the system is live and maintained and new projects or improved features are added in order to achieve the four objectives mentioned above.

Each phase contains specific elements that characterize the coordination practice in terms of governance, resources and tools.
**The Design Phase**

This phase included the general design of the project for the new social and healthcare information system in line with other health-related strategic objectives defined by the Region during its term of office. The Healthcare Department played a key role, supported by the in-house ICT provider Lombardia Informatica (LISPA), both as regards project planning and deployment and for defining the performance indicators to appraise the project’s results.

Data could also be shared with other public agencies in order to complement existing decision-making processes in broader welfare policy areas.

**The pilot phase**

During the pilot phase, the Healthcare Department and LISPA designed a prototype for the social and healthcare information system to be tested at providers’ sites in Lecco LHA, serving about 300,000 citizens.

The Regional authorities played a key role during this phase, defining the action plan for the pilot project (prototype site) and identifying indicators to measure performance and results.

As in the previous phase, the regional authorities laid down a general pattern of interaction, working with LISPA and Lecco LHA by way of administrative decisions, rulings and planning, embodying a hierarchical institutional arrangement. The choice of the prototype site outlines a hierarchical coordination mechanism with regional government playing a strategic role. During this phase, LISPA acted as the project manager for this innovation project.

LISPA founded a new company (LISIT), fully owned by LISPA, in order to carry out this phase, with the aim of managing the project’s operations with private partners, while achieving the standards and results expected by the Healthcare Department. The interdependencies between LISIT and the private partners were driven by market-type mechanisms, mainly in terms of contractual relationships with the Regional government, which outsourced operations to all the main actors (LISPA< LISIT and private partners).

The funding mechanism for the project was also linked to the implementation of the extension phase. All the private partners (and LISPA) involved in the pilot phase offered their services and products knowing that ultimately the winner of the public tender for the extension phase would pay them. This implied a high risk for the bidders who won the implementation of the pilot phase, since payment to them was subject to positive test results and the positive outcome of a new tender procedure for the implementation of the extension phase. Hence, this could not have taken place prior to the end of the 2-year pilot testing stage, and the Region’s approval of the prototype results.

The pilot phase was finally implemented and the Healthcare Department judged the results to be positive, subsequently launching the extension phase.

**The extension phase**

The extension phase lasted seven years, from 2002 to 2009. During this phase, the social- and healthcare information system was implemented across the regional territory and extended to all providers.

A part of LISIT shares (44%) was sold to the private partners who won the tender to expand the system implementation to regional level. LISPA still acted as project manager and retained the majority shareholding in LISIT. LISIT managed operations throughout this phase and, once the system had been implemented in 2009, the company was wound up.

The Healthcare Department defined the targets in order to reach full system implementation at regional level. Based on these targets, LISPA decided which actions were required to manage the project. A new tender was issued to source new private partners and extend the information system. The tender required future recipients to reimburse the former partners who had deployed
the pilot phase and introduced a project finance strategy. All the partners (i.e. private IT companies and LISPA) were remunerated on a pay-for-implementation mechanism once results were achieved, thus a contractual relationship ascribable to MTM logic.

Result indicators were defined in terms of the project’s progress, measured by way of: the IT system features deployed; the number of system users; the geographical area covered, usually linked to the full coverage of one result indicator at the premises of a health care provider. These conditions were compulsory if the private partners were to be reimbursed. Payment was on a fee per citizen basis, namely 10 Euros/citizen. Each LHA and PH had a set number of potential patients, based on residence in the providers’ area of coverage.

The extension phase took place in several stages. The first stage lasted one year and ended in 2003, extending the pilot project to cover a further 700,000 citizens. The next stages expanded the coverage of system to the entire Region with an increment of approximately 2,000,000 people in the area. Consequently, the geographical area involved was progressively extended in this phase.

In 2007, the regional government issued a regional ruling whereby all those involved in the regional healthcare system were required to use the social and healthcare information system in order to create an electronic patient record for every citizen.

As mentioned, the Healthcare Department considered the health- and social care information system to be a tool for promoting the achievement of strategic health-related objectives, including cost-containment, integration of healthcare services and continuity of care. For this reason, the regional government included results-related objectives for the project in the overall set of objectives that the CEO of each healthcare provider had to achieve as part of their mandate’s goals. Theoretically, this meant that poor compliance with the project’s objectives could actually result in the dismissal or refusal to renew the contract of both the CEO and her/his closest aides. In other words, the logic employed was to link the project’s progress to the appraisal of the targets assigned to regional directors/CEO.

Overall, this phase is marked by the setting up of a hierarchical organization by the Regional Government's Healthcare Department, with a planning and monitoring function.

All the providers involved in the regional healthcare system were progressively included in the implementation of the project. At first the LHAs and PHs were involved, followed by other categories, such as pharmacies, general physicians and private providers. As a result of the system’s implementation, coordination between these actors is now marked by network type mechanisms by means of information sharing.

The consolidation phase

Once the implementation phase had been concluded in 2009, the Region decided to consolidate the information system it had developed, focusing on extending the information system to social care providers, setting up electronic patient records and further development of the services offered to citizens.

During this phase, the EPR systems were being populated with data (the process is still ongoing at the time of writing) – which is heavily dependent upon the regional government defining and prioritizing the functions needed, in turn affecting the functions required of the system, and developments.

New objectives have been also set, including objectives to be met by the directors of the local healthcare providers, confirming the market-like mechanism of the project’s implementation, whereas reliance on hierarchical mechanisms has remained for the definition of objectives and strategy.
The funding mechanism is based on annual payments made to LISPA by the Region according to a negotiated budget, which includes management and maintenance projects as well as new development projects related to the healthcare information system.

This phase is still ongoing at the time this paper is being prepared, and involves all providers in the regional healthcare system. By using the health- and social care information system, organizations share the same information about patients and this helps to promote continuity of care throughout the entire Region.

**Veneto’s project for a regional healthcare information system**

As mentioned earlier, EMR’s were first introduced by LHAs in the early 2000s, but the region started its coordination program at a later date. 2007 saw the first regulations on electronic medical records, creating the groundwork for the digitization of clinical data, but it was only in 2010 that there was a “political boost” for the process to set up this coordination program.

The implementation of the project is still incomplete: some LHAs have already developed EMR systems with interoperable standards in order to exchange the clinical data of patients (such as healthcare organizations in the province of Verona), but others are still working on introducing EMRs at individual organization level.

*The Design Phase*

This phase took place in the early 2000s, when some local healthcare authorities and hospitals started designing ehealth pilot projects, for example the first trials for the digitization of medical records. These processes typically responded to demands to optimize the workflow and contain costs.

*The pilot phase*

LHAs moved away from departmental systems to the creation of repositories a few years later with the aim of conveying the various documents. Further to the introduction of digitalization, some LHAs started a process to introduce an Electronic Medical Record (EMR) system at organizational level.

The LHAs were the only ones involved in both the design and pilot phase and these two phases relied on their determination to introduce e-health solutions to improve the management of patient data and healthcare processes.

*The extension phase*

All public healthcare providers that were introducing EMR systems acknowledged the need for coordination and an ehealth consortium was set up to face this need. An initial step was the introduction of technical standards for electronic medical records in 2007, when the twenty-one LHAs and two PHs decided to coordinate ehealth issues via a consortium which would ensure the sharing of information on their projects and agree joint technical guidelines to safeguard information sharing and overall ehealth coordination.

The consortium was originally founded in 2005 to work on telemedicine projects, and has become a centre used by healthcare providers in Veneto since 2007 to ensure healthcare process improvements and promote collaboration between different organizations.

The consortium is the structural means through which horizontal and vertical coordination currently occurs, highlighting a network type mechanism. Horizontally, healthcare providers decide how to converge in order to govern and manage healthcare information and multiple information systems. However, they maintain full organizational autonomy for IT related decisions and procurement
processes. Vertically, the Region verifies the adoption of the regional interoperability guidelines via the consortium. Furthermore, by setting requirements (mainly technical) for sponsored projects, the consortium verifies compliance and grants regional funding for healthcare providers. The consortium mainly plays a technical coordination role.

LHAs are the key players during this phase, since they start to feel the need for coordination with one another in order to get the best possible value out of the introduction of ehealth.

Additionally, the healthcare authorities and hospitals are regional centers for experimentation and implementation of all the solutions outlined in the field of healthcare.

The consortium is the element through which coordination is achieved. In this phase, the Arsenàl.IT consortium does not play an active role in project management, as it does not deal directly with the implementation; instead, it supports the LHAs if they need it, and writes technical specifications for approval by the Region. Therefore, in this phase, the Region is responsible for ensuring any initiatives of individual LHAs are usable by other healthcare providers by approving the proposed standards.

*The consolidation phase*

After the 2010 regional elections, the new government agreed on the idea of introducing a regional EPR system, building on existing EMR systems. Veneto’s Healthcare Department realized that previous efforts in the region to establish an interoperable regional healthcare information system had been quite ineffective, mainly due to a lack of coordination. As a result, they decided to pursue regional ehealth objectives by making use of the relationship with the consortium.

In December 2010, the Healthcare Department issued a regional regulation, requiring healthcare IT departments to implement an EPR system within 2012 with seven specific objectives. The commitment towards the regional EPR system is also contained in the 2012-2014 Regional Healthcare Plan and in Regional ruling 1671/2012.

The latter ruling clearly defined the roles of the three parties:

- The Healthcare Department, in particular the Social Healthcare Information System Service, approves the specifications created by Arsenàl.IT and verifies their implementation by healthcare organizations. Its mission is to enhance the planning and organizational skills of regional healthcare organizations;
- Arsenàl.IT acts as a coordination platform for ehealth projects in addition to defining the technical specifications;
- Healthcare providers pursue the implementation according to the specifications outlined by the Consortium, enhancing both internal and regional performance and the quality of care.

In this phase, the Consortium becomes a facilitator, the Region is responsible for the governance of the project, going beyond regulatory issues and the approval of standards, and the LHAs give up some of their of autonomy and work according a logic of wider coordination. The phase is marked by the Region’s new governance role, leading to convergence and enabling the introduction of a solution making the clinical history and social welfare of all citizens available to all operators and citizens, at all times and in all places. The Arsenàl.IT Consortium has the task of planning and coordination and acts as a facilitator for the rapid development of the system. The LHAs forego some of their autonomy, to materialize their need for "networking" by implementing a system that offers interoperability of patient data.

The new regional government pushed strongly for the project to start, which later involved the various administrative levels of the regional healthcare system. Healthcare providers in Veneto are currently presenting a joint EPR project via Arsenàl.IT, with the aim of achieving greater convergence, which will result in an agreement in which the three parties have clearly defined roles.
A "network type mechanism" has been set up among the various LHAs via the Arsenàl.IT Consortium, strengthening coordination. Coordination occurs both at horizontal and vertical levels. The relationships established between the actors involved have a formal structure, based primarily on legal agreements signed by the various parties.

**Discussion and conclusions**

**Enabling conditions and lessons learnt.**

In this paper, we focused on the two contexts analyzed (i.e. the Italian regions of Lombardy and Veneto) and we illustrated the practices of coordination employed during the setting up of EPRs, discussing the mechanisms put in place to implement them. This final part aims to highlight the enabling conditions and the lessons learnt that may be deduced from the two cases.

The implementation of the regional healthcare information system, enabling all healthcare providers operating in Lombardy to access, retrieve and create data that can be shared by all others involved in the healthcare system, was a long and complex process. It required a series of change management functions to be completed, such as 'mobilizing constituencies', 'sustaining momentum' over more than a decade, and 'coordinating efforts'. This case study focuses on describing and explaining how the last – but not least important – function in the change management process was carried out, namely 'coordinating' the various actors involved.

Certain ‘enabling conditions’ may be deduced as having led to the execution of the change management function.

- Firstly, strong and continued commitment and support at the highest level (the President of the Regional Government and his closest aides) for the development of the shared healthcare information system.

- Secondly, the centralized regulatory role of the Healthcare Department, which played a central role in defining the nature of the vertical coordination mechanisms. The planning and control system, centered on the constant supervision and monitoring of the targets assigned to CEOs, including target indicators to measure EPR project implementation, were crucial for engaging top executives in the project. In a similar manner, the regional government used HTMs to engage partners (LISPA, LISIT and private IT companies) in the implementation of the project. The design of the contract not only embedded specific provisions in its terms, but set up a pay-for-implementation mechanism which pitched providers' compensation to the progress of the shared information system. HTMs were also employed to make private healthcare providers adopt, share and use the system by only allowing them to offer care services reimbursed by the regional public healthcare system if they used the healthcare information system. Fundamentally, monetary incentives were put in place.

- Thirdly, LISPA’s knowledge of the healthcare information management business, its project management capacity and its collaborative relationship with the Healthcare Department supported the project’s implementation during all phases. This knowledge was developed by LISPA as the project unfolded over time: LISPA gained knowhow and expertise in the management of complex technological innovations in healthcare systems, becoming a facilitator as well as a project partner. This was possible due to the definition of a formal system of governance for the project, which eventually led to the creation of a new entity (LISIT). To complement it and ensure ongoing assistance for all the LHAs and PHS involved, LISPA de-located employees at their premises during the extension phase. This turned out to be useful for mitigating any resistance and for engaging with the shared information system at street level.
Summing up, this combination of governance and planning arrangements, together with continued commitment by the top political and administrative players (the social mechanism of actor certification might be hypothesized to have been in place), seems to ‘have worked’ in the extant case, producing a practice (in the form of a set of coordinated tools, adapted over time) that has worked.

With regard to the case of Veneto, we can identify some enabling conditions, which have fostered the coordination practice described above.

- The main enabling condition is the need, recognized at the lowest level, to implement converging ehealth projects leading to a beneficial situation for individual healthcare providers and for the regional healthcare system. From this comes the potential for positive contamination between different healthcare agencies in the implementation of the Regional EPR system.

- Sustained political support represents another enabling condition, in the form of the strong desire manifested by the new regional government to put together all the different EMR projects, underlining the need for a Regional EPR system, introduced in the new Regional Social and Healthcare Plan, also in order to fulfill regulatory constraints imposed by national law.

- We can also pinpoint the essential role played by Arsenàl.IT Consortium that created an inter-organizational collaboration for these issues, providing technical support for healthcare organizations and thus representing a facilitating platform.

Starting from a ‘practice that works’ (i.e. useful for solving a collective decision-making problem), how can it be employed in another situation?

According to Ongaro (2009a), a useful starting point is the consideration that ‘learning from second-hand experience (the extrapolation problem) is more complex than ascertaining whether a given practice is effective in the source site (the evaluation problem)’. This leads us to the extrapolation problem: ‘[E]xtrapolation is the process of learning from vicarious experience and designing practices fitting the (new and diverse) circumstances to which the practices are to be applied.’ (Ongaro, 2009a, p. 2).

When trying to sketch out the possible context conditions in the case examined, we may point out the following: firstly, political stability granted continuity in vision, priority and objectives. Secondly, the degree of professionalism of the key actors in the project: the Healthcare Department and LISPA, in Lombardy, ensured any emerging challenges were dealt with appropriately. Thirdly, the specific era of the project, the fact it was a pioneer: ten or more years ago, the development of healthcare information systems was limited for many healthcare providers, as was the regulation of the field by national authorities. This made it possible to design the shared information system, that the Electronic Patient record is based on, almost from scratch and to engage stakeholders in a project that was going to be a forerunner, having the mint of ‘innovativeness’. This promoted commitment and involvement in the project.

Furthermore, based on the experience in Veneto, some of the elements highlighted can easily be replicated in other contexts, such as the significant enhancement of existing projects in the regional territory and the development of a concrete ability to attract financial resources.

Thus, even if the project has not been fully implemented, we can still identify some relevant lessons.

First of all, a strong commitment is needed over time in order to manage the change introduced by a coordination practice. Some LHAs encountered resistance to change, which was overcome mainly as a result of the consortium’s leadership.
Secondly, coordination is more readily attainable if there is shared culture and common interests. The decision to establish a formal coordination structure, like a consortium, was also an enabling factor: it has the ability to develop and coordinate projects involving the LHAs, so that shared ehealth objectives can be reached since individual LHAs would not be able to achieve them alone.

Thirdly, compliance with national and European ehealth guidelines facilitates access to additional financial resources. In a period of financial difficulty, hampering new innovation projects, organizations have to find alternative forms of funding. This has led the organizations to develop superior fundraising capabilities.

As a final remark, although the focus of our analysis was the coordinating of the implementation process behind the introduction of a significant innovation like Electronic Patient Records, it should be remembered that the EPR is in itself a coordinating device, a technical, organizational (and social) tool facilitating the managing of interdependencies, allowing a multiplicity of providers and stakeholders to operate in the healthcare sector in a way that more integrated process are set up.

Further studies will explore and analyze the main effects of the practice as well as possible side effects.
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