ICT Management Issues in Healthcare Coopetitive Scenarios

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ABSTRACT

In this paper we will outline some issues that the management should address in ICT projects framed within networks of healthcare delivery. Networks of independent healthcare service providers (e.g. specialized hospitals, laboratory analysis, family doctors) are getting very common. In such scenario, data sharing activities among different actors are very common and ICT is a pregnant technology. Concerning the ICT project management, the traditional hierarchical management model is not feasible for network contexts. The management can't rely on traditional hierarchical approaches, but should switch to a negotiation model, through which the desired goals has to be reached by means of negotiation with the independent actors involved in the project. We will illustrate these topics through a case study, afterward we will outline some requirements that a project manager profile should have in order to manage appropriately ICT projects framed in network of independent actors.

1. INTRODUCTION

Healthcare processes are very complex, even a simple one (e.g. the request for medical analysis) may involve different actors (family doctors, analysis laboratories, specialized physicians, administrative staff) providing several services. More complex services are present in a network scenario. "Currently, the situation of healthcare in Europe and in the U.S. is characterized by a process of transition, where isolated hospitals and individual practices are merging into networks of healthcare delivery" (Kuhn, Giuse, 2001).

From one hand, ICT can play a big role in this scenario: it can improve the coordination and the information sharing among the several providers involved in a healthcare process, whereas these tasks traditionally have been committed to the citizen/patient. E.g. the citizen contacts a service provider and asks for a service (e.g. she/he books for laboratory analysis), collects the analysis results and reports them to the family doctor. This is just an example, some more can be provided.

On the other hand, "it has even been stated that there is an 'absence of real progress [...] towards applying advances in information technology to improve administrative and clinical processes" (Hurtado et al., 2001).

In the sequel of the paper, we point out that in large ICT based healthcare projects (especially in the context of networks of healthcare delivery), some project management issues may frustrate a positive application of ICT technologies.

In Sec. 2 the peculiarities of networks of healthcare delivery will be analyzed, in Sec. 3 we will provide an example framed in a network context that will be used as a reference in the following sections, in Sec. 4 some project management issues will be outlined, and finally Sec. 5 will draw some conclusions.

2. COOPETITIVE NETWORKS OF HEALTHCARE DELIVERY

Healthcare scenarios where different actors and institutions (hereafter entities) collaborate in providing healthcare services are examples of the network model described in management literature. The network model is characterized by a set of independent, loosely coupled nodes that collaborate to provide complex services.

The network model has advantages and drawbacks, that we will illustrate shortly. The companies, actors, organizations (hereafter nodes or actors) being part of the network may easily build ad hoc relationships, therefore very different actors can get in touch and collaborate. Furthermore, the nodes can easily replace partners with similar ones. This fosters innovation, creativeness, and competitiveness. Considering the network model drawbacks, the loose relationships requires a lot of coordination effort among the involved actors, which are characterized by different cultural background, different interpretation framework, and different information management capabilities.

Frequently the coordination effort among the several actors involved in the provision of a healthcare service is up to the final customer, an example has been cited in the previous section, where a citizen books for analysis, later she/he has to collect the results and bring them to the family doctor. The shift of coordination effort from the patients to the service providers requires to establish collaboration among the healthcare service providers, which however are competitors.

Such a interaction among the competitors may be modelled by making use of a "coopetitive behaviour". The term coopetition is used in management literature to refer to a hybrid behaviour where the actors cooperate in some areas while compete in some others. In a healthcare networked scenario, collaboration concerns the patient data sharing among different providers to coordinate combined healthcare processes, while competition concerns the research of customers to which provide services. Some authors (Brandenburger et al., 1996) (Gnyawali et all., 2001) (Lado et al., 1997) have recently emphasized the increasing importance of coopetition for today's inter-firm dynamics.

Information management is a strong issue in the just introduced scenarios, and can be addressed by the federation of information systems. Federated information systems for coopetitive settings have been studied in (Cesarini, Mezzanzanica, 2006).

Next section will describe a case study and an ongoing ICT project that will be used as reference in the subsequent sections.

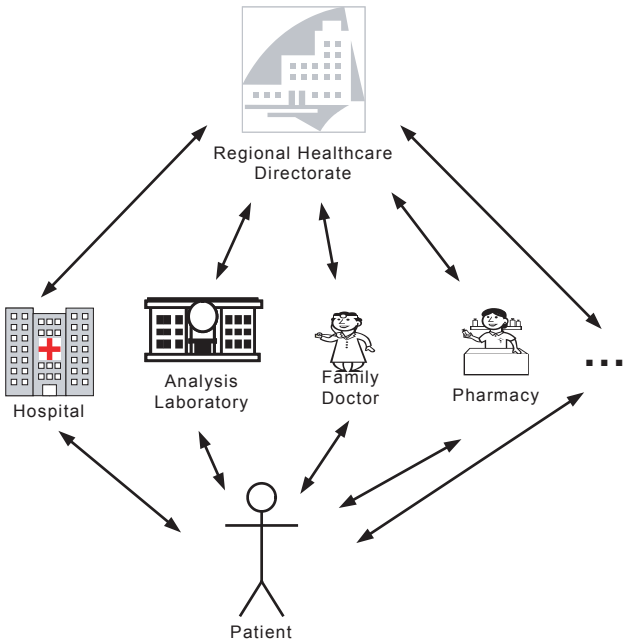
3. THE LOMBARDY CASE STUDY

In this section we are presenting the healthcare model actually deployed in Lombardy (a region in Italy), which is an example of a networked healthcare setting, as well as an ICT project that is currently ongoing. The actual healthcare model in Lombardy is the result of the evolution of a public (state based) healthcare provisioning model. The healthcare services are delivered both by public structures and by private ones. Citizens are free to select the service provider, which is paid by the state on a reimbursement basis. The citizens do not pay directly for receiving healthcare services (except a minimal pay-per-use fee). In this context, the private and public actors providing healthcare services, share administrative information with the Regional Healthcare Directorate (the public administration responsible for the healthcare service provisioning) in order to compute the total expenditures and the reimburses (Lombardy H.C. Directorate, 2003).

The coordination among the different entities involved in the provision of a combined service is actually up to the patient, especially concerning the medical information sharing, as reported in Fig. 1.

An ongoing project, whose name is SISS (Sistema Integrato Socio Sanitario, which is the Italian for "Social Healthcare Integrated Information System"), is experimenting a new way of sharing patient medical information among different service providers. The core of the SISS project is a federated information system, which connects all the entities offering healthcare services in Lombardy,

Figure 1. Before the introduction of the SISS. The patient was the responsible of sharing information



and which can be used to share medical information (e.g. clinical records, medical prescriptions, x-rays pictures, laboratory analysis), as showed in Fig. 2. For example, the SISS will allow a family doctor to access the patient data (e.g. the x-ray analysis committed to a laboratory or the clinical records related to the last hospitalizations) hosted by other entities directly by its PC.

In addition to sharing medical data, the SISS can be used to reserve physical examinations and laboratory analysis by each entity connected to the system. Furthermore, the SISS is used to provide statistical information in real time to the Regional Healthcare Directorate.

The project is structured on three phases: prototyping (performed on a small area), validation, and large deployment (on the whole regional area). The project is on-going and it is currently on the large deployment phase. The project is managed by a project management committee (central project management or CPM hereafter) and the management activities involve the local ICT managers (LPMs hereafter). The latter are people responsible of the ICT facilities within the connected entities (e.g. hospitals, laboratory analysis, pharmacies, family doctors). In case of simple actors (e.g. pharmacies and family doctors) the ICT manager role is carried out either by the actor her/himself or by a representative. In most cases the local project manager is a person already present in the local organization structure.

4. MANAGEMENT IMPLICATIONS

Some critical issues emerged during the prototyping and validation phases of the SISS project, as reported by the project management and audit documentations.

Some considerations should be drawn before analyzing the emerged issues. The SISS is an information system created with the aim of supporting the circulation of medical information and more generally the provision of complex healthcare processes, where different actors, not necessarily having already established relationships, are involved. The processes provided by means of the SISS relies on the carry out of "local tasks" (i.e. local business processes), a single local task failure is likely to cause the failure of the whole aggregate process (e.g. should a laboratory not provide analysis results to the SISS for any reason, the processes relying on this information cannot start). The local tasks should be supported by both the local information system and by the local business processes, which should have been adapted to the requirement of the SISS project.

The issues emerged during the project phases, the reasons, and the actors involved have been shortly summarized in Tab. 1.

The emerged issues were mainly ICT related, however a deeper investigation showed that the main problem was a lack of communication among the CPM and the LPMs, which was caused both by an inadequate project governance model and by some cultural gaps.

Concerning the project governance, the local managers have not been effectively involved, they were just consultant and not decision makers during the planning and prototyping phases, consequently the central project management underestimated the impact that the decisions would have had on the local involved entities (especially the large and complex ones) and on the time necessary to carry out changes. Although the CPM performed a deep survey and evaluation of the local entities, ICT infrastructures, and processes, the scarce implication of the local ICT Managers in the decision making activities resulted in a poor project management.

Considering the cultural gap, the novelty of the exploited technologies, created difficulties for the local ICT managers[1]. A lot of local ICT managers were

Figure 2. After the Introduction of the SISS. The Patient's data can be accessed by every actor

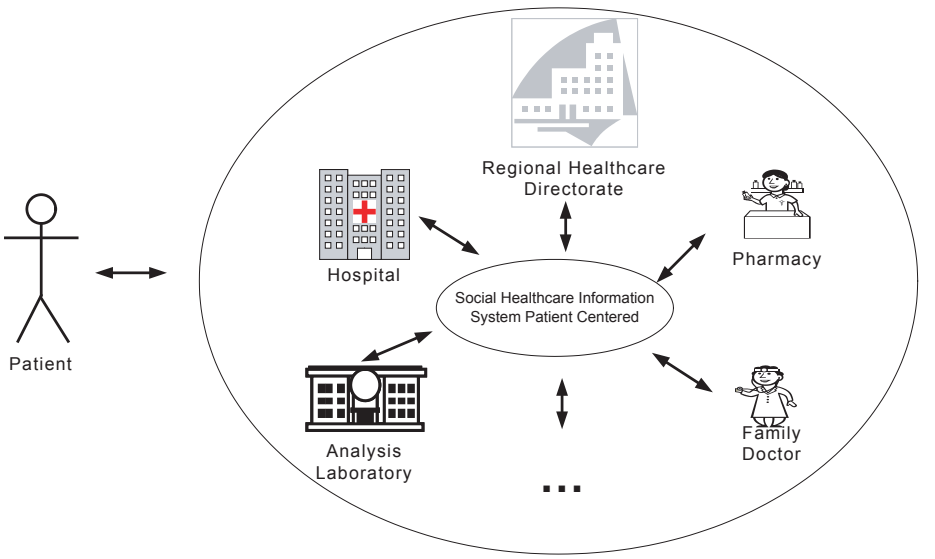


Table 1. Chronological report of the project phases, actors involved, emerged issues, their rationale, the corrective actions carried out. Differences from a phase to the following one have been highlighted. The non relevant cells have been left empty

Project Phase	Actors and Interpretation Framework GAP (IFG)	Emerged Issues	Reasons	Corrective Actions
Project Planning	• CPM (Decision Making Role) o No IFG on technology o High IFG on local organizational impact • LPMs (Consulting Role) o High IFG on technology o Low IFG on local organizational impact			
Prototyping	• CPM (Decision Making Role) o No IFG on technology o High IFG on local organizational impact • LPMs (Consulting Role) o High IFG on technology o Low IFG on local organizational impact • Users (Entities) • Users (Patients)	• Long service inactivity time • Long malfunction time • Huge users disappointment • Huge delays • System low performances • Not adequate improvement of local processes and ICT infrastructures • The delay and malfunction times were **quite higher with respect to the time necessary to implement technical and organizational changes in the local entities**	• Distance among the interpretation schema of CPM and LPMs about o Change processes o Technologic innovation processes o Time and expected results • Poor involvement of the LPMs in the project global decision making activities • Poor feed back activities to the CPM • Lack of project vision understanding by the LPMs	• Improvement of the management model o Actively involve the LPMs in the CPM decision making activities o Substitution or training of some LPMs • Project timelines modification to take into account the time necessary to perform the local changes
Validation	• CPM o No IFG on technology o High IFG on local organizational impact • LPMs o High IFG on technology o Low IFG on local organizational impact • Users (Entities) o High IFG on technology o Low IFG on local organizational impact ~~o **Users (Patients)**~~			
Large Deployment	• CPM o No IFG on technology o **Low** IFG on local organizational impact • LPMs o **Low** IFG on technology o Low IFG on local organizational impact • Users (Entities) • Users (Patients)	Work in progress	Work in progress	Work in progress

involved, each having different skills and knowledge, however some of them were unable to understand the project vision and the changes to enforce on the local infrastructures and business processes. Some local information systems not properly connected could be considered a negligible topic, however we recall that a failure in the provision of a local process is likely to cause the failure of any related global process. The cultural problems can be summarized by saying that there was a high gap among the interpretation framework of the CPM and the interpretation framework of the LPMs.

The CPM decided to focus initially on the governance and cultural gap issues and to address later on the ICT ones. Two corrective action were adopted: the LPMs have been effectively involved in the central level decision making activities; some of the LPMs have been replaced or trained. The participation to the decision making activities helped the CPM and the LPMs to fill the gap among their interpretation framework. In the large deployment phase the local ICT managers (of the new entities involved) were able to understand the project vision and to correctly modify the existing local ICT infrastructures and business processes. Furthermore, they correctly estimated the impact of the SISS projects on the local entities, so they were able to provide feed backs to the CPM about delays and project improvement, that could affect the global project timeliness and deployment. The governance approach initially adopted contradicts the logic underlying the network scenario where the project is enacted. The initial approach relies on hierarchical relationships that are not present among the CPM and LPMs, while the approach adopted later relies on negotiation among CPM and LPMs, which is a far better approach in a network of loosely coupled entities.

We will outline briefly the requirements that the ICT management should satisfy, in order to be able to manage appropriately ICT projects in healthcare (and in other fields as well) framed within networks of loosely coupled entities. The project manager should identify the most significant management profiles involved in the

project. Meetings should be established as well as other ways of sharing knowledge among the identified people. The goal is to fill the people interpretation schema gaps and to integrate their different competences into a steering committee, in order to support the project design and enactment. The project manager could also encourage the involved people to participate to training activities in advance.

The cooperation management is a very important risk factor as well. The traditional hierarchical management model is not feasible in a network context (of loosely coupled institutions), because there are no direct hierarchical relationships among the involved entities. The management should switch to a negotiation model, through which the desired goals has to be reached by means of negotiation with the involved actors. In this streamline, it could be useful to negotiate in advance with the involved people that the project organizational logic should be different from the local (most probably hierarchical) ones.

5. CONCLUSIONS

In this paper we described some requirements that a project manager profile should have in order to successfully manage large healthcare projects having an ICT characterization. We focused on a specific scenario, called networked scenario, where a network of loosely coupled actors (both people and institutions) operate to provide healthcare services. Such a scenario has been identified as the direction of an emerging trend in the healthcare market, therefore it deserves special attention. Furthermore, many promising projects in such a scenario are ICT based. An important risk factor in those projects is not technological related, but concerns communication among the decision makers within the nodes involved. The cultural gaps are strong barriers to the cooperation, which is necessary to carry out projects in networked scenario. We claim that the managers' poor ability to handle appropriately these factors may cause the failure (or the poor revenue) of an ICT project. We have briefly pointed out the skills that a project manager should have in order to successfully manage ICT based projects in networked scenarios (framed in the healthcare domain). We can summarize them by saying that the manager should identify the most significant management profiles involved in the project, should actively involve them in the project management committee and should overcome all the cultural gaps. The traditional hierarchical management model is not feasible in a network context cause the absence of direct hierarchical relationships among the network nodes. The manager should be able to negotiate with the involved actors in order to reach the project goals.

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(Lombardy H.C. Directorate, 2003) http://www.sanita.regione.lombardia.it/pssr/health_care_direc.pdf

ENDNOTE

[1] Web services and digital signatures were not well experienced by the practitioners and local ICT managers at the beginning of the project (year 2000)