

# ITIL Assessment in a Healthcare Environment: The Role of IT Governance at Hospital São Sebastião

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**Abstract.** This paper addresses the role of IT Governance in a Hospital Information System (HIS) management. ITIL is introduced as a best practice for supporting HIS development. Since IT Governance is extensive, we focused our study on an ITIL Assessment. The assessment was centred on IT Service Management, and which, according to our findings, is being carried inefficiently in Hospital São Sebastião. Although the literature quotes the many benefits brought by ITIL to the organizations, they all depend on how good the planning and implementing processes are. The implementation process itself is very complex and we focused our study on the assessment step. The ITIL assessment was crucial to identify IT Governance weakness; and it is a way for the organization to become consciousness about IT improvement priorities. The results were used to rethink HIS strategy in order to properly address the next challenges.

**Keywords.** hospital information systems, IT governance, ITIL assessment, CIO

## 1. Introduction: Problem Definition

National healthcare systems are facing important challenges regarding the development of Information Systems (ISs) [1]. Most hospital information systems departments (HISD) in Portugal lack managerial maturity, i.e., conditions are not suited to further HIS development [2]. Problems such as: lack of skilled personnel, lack of project management skills; unbalanced IT budget allocation; fragile IT operational management; lack of data protection and security management; lack of IT strategy and leadership; were identified [2, 3]. Attending to the nature of these problems, one may notice that they are related with IT Governance inefficiency as the main barrier to HIS development. IT Governance can be defined as the preparation for, making of and implementation of decisions regarding goals, processes, people and technology on a tactical and strategic level of the IT organization [4]. The IT Governance standard ISO/IEC 38500 provides guiding principles to effective use of IT according to Calder-Moir *framework* which sets out six principles: responsibility; strategy; acquisition; performance; conformance; and human

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behaviour [5]. To validate our hypothesis we studied an ITIL assessment performed at Hospital São Sebastião (HSS). HSS was selected because it is one of the most mature among the Portuguese hospitals [3] (HSS was an awarded HIS in 2008 [6]). This study will elucidate about the value of IT Governance practices in the hospital setting. Although the literature reveals the many benefits brought by ITIL to organizations, they all depend on how good the planning and implementing processes are [5]. HSS is a healthcare unit located in Feira founded in 1999. The hospital has 310 beds and 986 professionals (from which 159 are doctors and 276 are nurses). It serves the north side of Aveiro's district (North of Portugal), serving a total population of 383,050 inhabitants.

## **2. Methodology**

Since IT Governance is extensive, our study is focused on one single problem [2]: the "IT Service Management". The implementation of IT service management processes is difficult due to many actors involved. We focused our study on the ITIL assessment step, which is crucial to identify weakness, ways of improvement and a way for the organization to get conscious about IT. Since ITIL is a triad (people, processes and technology) an assessment should provide a holistic view of the results and actions to take [5]. Finally, we will be applying the framework to HSS, focusing the assessment on both Service Desk and Incident Management processes. In this context, our motivation is not only to understand the current situation of ITIL practices in Hospitals, but also to understand how an ITIL implementation can bring benefits. We want to analyse the level of IT governance maturity and produce some recommendations to improve IT Service Management practices. The ITIL assessment goal is to identify which gaps exist between the current organization practices and how the organization should perform according to ITIL, and what key actions need to be taken to close those gaps [5, 7].

## **3. Hospital São Sebastião's ITIL Assessment Procedure**

An ITIL assessment process comprehends the following main steps [5]: process assessment; organizational assessment; technology assessment; governance assessment; assessment finding analysis; recommendation actions identification. The aim of the organization assessment is to analyze how well the organization might support, or not support, an ITIL improvement initiative. The output of this stage should: highlight organizational readiness for change; highlight skill gaps; identify current IT Service Management roles and responsibilities; include stakeholder analysis; identify organizational assessment findings. To assist with the task of identifying roles and responsibilities and communicating levels of authority, the ARCI matrix can be used as a very useful management and communication tool [8]. When faced with a large project, the ARCI model can assist the initial stakeholder analysis and project planning stage, which is also used to map out processes and identify areas of responsibility at the task level. To evaluate the ITIL framework we focused our attention towards two ITIL items: Service Desk and Incident Management. The HISD is coordinated by a person that assumes a role as CIO. A HISD's environment analysis was performed. There are potential issues that can negatively affect governance performance [2]: The CIO is not a member of the hospital board, but his integration in the board is seen as a good IT Governance practice; There are problems regarding strategy communication, which may

compromise strategic alignment among service units; HISD plays an important role and supports all the value chain. It is true there is a help-desk system with an integrated knowledge base, which also supports an incident management workflow, however, IT service management comprehends a lot more than help desk and incident management. At HSS, doctors and nurses represent approximately 65% of the total professionals and weight 50% on total expenses. They are the main source of value and are highly qualified: It is important to keep up their satisfaction levels. There is a lack of HIS personnel and the current staff rationalization pressure is increasing the problem. Operational efficiency is a very important issue that should be addressed to mitigate personnel shortage.

### 3.1. Hospital Information System and HIS Department

HSS owns today a unified HIS platform that aims to serve both management purposes and helping professionals doing better their job. This application provides physicians and nurses with an integrated view of patients' clinical information, from admissions to exams and surgery reports. Since 1999 those physicians create and store medical records right into the datacenter storage bank. The architecture definition was a long working process. The HSS board has recognized that a huge effort was carried out to minimise risks concerning the information management, data privacy and protection [3]. The HIS is identified as a successful one [6, 9], and HISD is well positioned within the Nolan matrix compared with national average [2] and it is very competitive compared with other countries [6]. This success is the result of a long process driven by three main factors: time (i.e., organizational strategic stability), CIO leadership (that allowed physicians' participation) and a natural emergence of *ad-hoc* IT Governance mechanisms.

### 3.2. ITIL Assessment

To assess the IT Service Management (ITSM) maturity we used the OGC questionnaires [10] (answered by the CIO) to understand how well HISD is performing in comparison with ITIL best practices, which were then analysed to verify if the information gathered was in conformance with field observations. This allows avoiding answers that do not correspond to the reality of HISD. Figure 1 shows HSS ITSM low maturity.

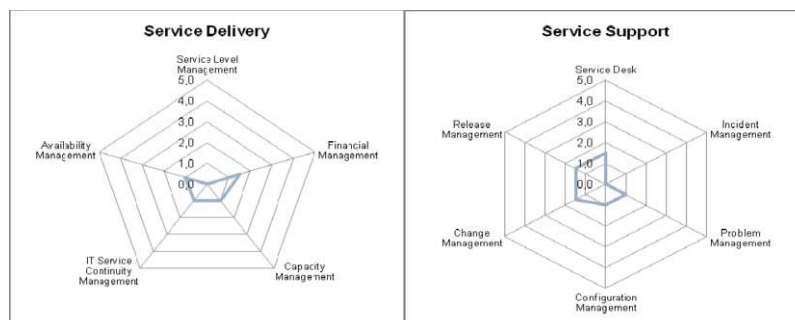
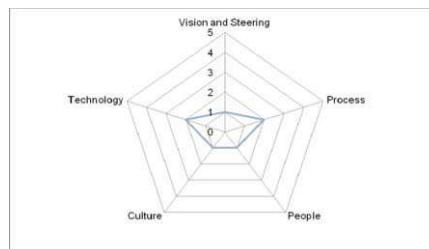


Figure 1. HSS ITIL processes maturity (from OGC questionnaires)

In general, when ITSM processes are at an initial stage they present maturity level of 1. Here, both Incident and Service Level Management fail to achieve the minimum level of prerequisites (maturity level of 0). This means that, IT Service Management processes

are ad-hoc, show random approaches and actually few are defined. Regarding Incident Management: First, it provides immediate benefits and it is seen as a quick win, therefore is sometimes proposed as the first process to be tackled [11]. Second, it presents one of the lowest maturity scores, which we consider to be unacceptable for a HIS. Despite we could identify a workflow for Incident Management, the reason it scores 0 is due the fact that it fails on the mandatory field “are incident records maintained for all reported incidents?” on pre-requisites level. The rate on which HIS members are directly contacted for incident resolution was readily noticeable during our first meetings. Actually, the HIS collaborators are the first to complain about how this problem affects their efficiency. The HISD structure, in which any one can do the Help-Desk, does not contribute to solve this problem. For the earlier given reasons we decided to focus our research on Incident Management and an in-depth assessment was conducted.

*Incident Management Process Maturity Framework.* An incident is any event which is not part of the standard operation of a service and which may cause a reduction in the quality of that service. The main purpose of Incident Management is to return to the normal service level as soon as possible mitigating or eliminating the effects of disturbances in IT services. To an in-depth assessment of Incident Management we followed Steinberg’s [5] method and considered the four ITIL P: *process; people (or organization); products (or technology);* and *performance*. Finally, with the information gathered we mapped the Service Desk and Incident Management into the ITIL Process Maturity Framework [8]. With the information gathered we now have foundations to score Incident Management maturity according to the ITIL Process Maturity Framework (PMF). The PMF framework is interesting as it enable us to score an ITIL process according to five distinct dimensions: vision and steering; process; people; culture; and technology. Therefore, a more in-depth maturity inspect can be carried in comparison to OGC questionnaires. The result is presented on Figure 2.



**Figure 2.** HSS incident management process maturity framework score

From Figure 2, one can notice that technology and process dimensions are the most mature Incident Management processes, scoring 2. Vision and Steering, People and Culture dimensions lag behind (score 1). In this scenario, technology defines the process, therefore the higher scores in these two dimensions. Hence, HISD needed to do something to cope with the high rate of incident resolution requests of their HIS users, i.e., if organizational, cultural and management issues are not addressed in order to achieve a level 2 maturity, no further developments are possible for HSS Incident Management.

*ARCI Model: HSS Team Structure and Responsibilities.* To understand the team structure and the responsibilities of each member, we have used the ARCI (Accountable, Responsible, Consulted, Informed) model [8]. First, HISD main functions were identified (Table 1). The HISD ARCI matrix is presented on Table 2, which shows the team structure and their responsibilities regarding the department main functions.

**Table 1.** HSS HISD main functions

ID	Function	ID	Function
1	Department Administration and Management	8	User's Training
2	User Support/Help Desk	9	Project Management
3	Network and Communications Management	10	Procurement and Stock Management
4	Database Management	11	Innovation
5	Applications Management and Support	12	Probationers Coordination
6	Clinical Applications Development	13	Informatics Prevention
7	Support Applications Development	14	Business Interaction

The ARCI matrix reveals a high degree of overlapping functions among members, and points out inefficiencies in IT service management: any HISD member can be responsible for help-desk, including the CIO. Actually, the CIO is not only accountable, but also responsible for a large number of functions, including most projects' management.

**Table 2.** HSS HISD ARCI matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CIO	A/R	R	A/R	I	A/I	C/I	C/I	A/R	A/R	A/R	A/R	A/R	A/R	A/R
Network Manager	C/I	R	R		R			R	R		R		R	R
Project Manager	C/I	R	R	R	R	A	A	R	A/R/I		R	R	R	R
Technician 1	C/I	R			R				C/I					
Programmer 1	C/I	R		C/I	R	R								R
Database Manager	C/I	R	R	A/R	R	R	R	R	R/C/I	R	R		R	R
Support DB Manager	C/I	R		R	R		R	R	R/C/I					R
Programmer 2	C/I	R		C	R	R	R	R	R	R	R	R	R	R
Programmer 3	C/I	R			R	R	R	R	C/I					R
Programmer 4	C/I	R			R	R	R	R	C/I					R
Technician 2	C/I	R			R				C/I					

#### 4. Conclusions

This study presented an ITIL assessment framework applied to HSS with relevant meaning: IT Governance inefficiency is an important barrier to HIS development, mostly in IT service management which has a direct impact in users daily working life, and it is relevant to assess the current state of ITIL processes maturity and to analyze its impact on the Healthcare services delivery. It also means that the CIO will have to deal with its many variables and barriers.

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