Innovazione per il Management della Salute: il caso di un ospedale della Regione Campania

Innovation for Health Management: the case of a hospital in the Campania Region

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Abstract

Introduction Based on the data collected from a Hospital in the Campania Region, this work intends to analyze the functioning of the Information Technology (ITC) systems operating in the abovementioned region, and describe their areas of application.
Methods This work was carried out by considering the specifications in the tender for the implementation of the integrated information system, launched in 2012 by a hospital in the Campania region. The starting research questions were: 1) How can computerization improve management outcomes in the healthcare area? How can technological innovation improve performance quality?
Results The introduction of the ICT system within the hospital allowed obtaining all the information related to the clinical path of the patient, regardless of the physical position and the competence levels.
Conclusion Thanks to this study, it was possible to demonstrate that the use of ITC systems, in addition to providing essential technical support to electromedical equipment with a high rate of technological innovation (e-health technologies), can also be a tool for corporate management in the healthcare sector.

Keywords

Health innovation, Information Technology, Management.

Introduction

Healthcare is certainly a field in which the development of new scientific knowledge is frenetic, and fast-expanding technology (especially in recent year) has proved to be extremely rapid (WHO, 1946; Bergamaschi, 2009; OTA, 1976). Technological innovation has taken on a strategic role in turning the economies of industrialized countries from a manufacturing economy into a service-type one.

In the specific case of health technology, the most exhaustive definition is that proposed by the OTA (Office of Technology Assessment) according to which "all the instruments, equipment, medicines and procedures used in the provision of health services, as well as **the organizational and support systems through which healthcare is provided**" fall into this category (Chaudhry et al, 2006). It is precisely among these support systems that the application of information technology in the healthcare field is placed.

Information technology supports the provision of healthcare systems by substantially covering two functions (Linder, 2007; Free et al, 2010; deTolly et al, 2012):

- **ASSISTANCE** function: it is an essential component of the functioning of modern healthcare techniques. It is clear and documented that technical support is an indispensable element to guarantee the operational continuity of applications characterized by a high rate of technological innovation. It would not be possible to further innovate, manage and analyze existing techniques without information technology.
- **ORGANIZATIONAL** function: **automating** office procedures through the use of computers and software has led to an "organizational revolution" in the healthcare system, something that can be observed by anyone entering a healthcare facility. This process is called "**Computerization**" and is applied in various areas, which will be described in the following chapters.

Computerization refers to the introduction and application of computer systems and networks to a certain sector or economic/work activity. It involves the automation of office procedures through the use of computers and software. Computerization is linked to the development of a particular sector called Information Technology (ICT).

The acronym ICT refers to the sector related to the development of Internet and mobile devices. More generally, technologies include all the methods and techniques used in the transmission, reception and processing of data and digital information (Prabhakaran et al, 2010; Istepanian et al, 2009).

Technologies are used in many areas of everyday life, and are remarkably changing almost all socio-economic sectors, mainly because it has become essential to effectively and efficiently manage the growing amount of information. These technologies provide better data and information, and can help organizations redefine their relationships with customers, suppliers and other organizations.

Information technologies enable data manipulation by means of conversion, storage, protection, transmission, and secure recovery systems (Riva et al, 2007; Belfiore et al, 2018).

Research activities and studies on the ICT in healthcare have shown that the introduction of computerization processes in this sector is a mandatory step for three reasons:
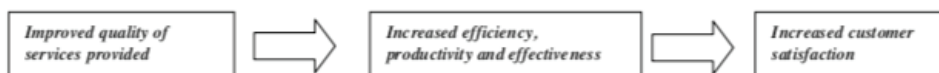
The use of information technology has made it possible to evaluate:

Process **input**: epidemiological evaluations on appropriateness, preoperative risk and attractiveness indexes for patients going the various facilities or using their services;

General **process**: evaluation of the various activities carried out and, consequently, of the various diagnostic and therapeutic procedures used, with information also on the costs incurred;

Process **output**: Evaluations of both the output, such as the use of appropriate medicines for that diagnosis, and of the outcome, allowing identifying the therapeutic methods chosen that have obtained the best outcomes.

An example of a tool that has made it possible to improve the quality of health services, thanks to the implementation of ICT technologies, is the **digital medical records system**.

It is one of the most important innovations in the healthcare sector, designed and developed to collect not only clinical data from patients, but also administrative information, consisting in data on the use of human and material resources to obtain a correct diagnosis (Gallè et al, 2017).

This process provides a range of advantagesin many respects, but it is also linked to various critical issues. Below a summary scheme of this aspect:

Critical issues of a computerized health management system	
Users management costs	**Outsourcing**
Health Information Systems are part of a technological area with a high rate of innovation, and require high skills and human resources. Innovation processes must be supported by consulting, training and support services. In this sense, the importance of the "service" factor affects management costs in a directly proportional way to the amount of innovation contained in that technology.	Healthcare facilities that have relied on ICT innovation have dealt with the urgent need to outsource,consisting in complete operational responsibility assumed by a private third party, which guarantees the user the full functionality of information systems and thus not attributing to administrators all the technical know-how and staff-related problems. It is implicit that outsourcing involves both economic and qualitative risks.

Source: Our elaboration

1. Objective

The objective of this work is to find out if the use of ICT systems, in addition to providing essential technical support to electromedical equipment with a high rate of technological innovation (e-health technologies), can also be a tool for corporate management in the healthcare sector

2. Case study

This work was carried out by considering the specifications in the tender for the implementation of the integrated information system, launched in 2012 by a hospital in the Campania region. The specifications clearly and comprehensively indicated the problems in the hospital in question, and what improvements it expected from the introduction of an integrated information system in the clinical, healthcare, accounting and administrative area (Belfiore et al, 2017; Omachonu, Einspruch, 2015). The analysis of the winning supplier has allowed having a clear picture of the technologies and information processes introduced in the hospital. Finally, the state of the art of computerization after five years was evaluated. The technologies used were:

ERP (Enterprise Resource Planning) Platform; Digital medical records system; Coordina-

tion between the Inpatient Department and Diagnostic Services activities within the Hospital, and between the latter and the territory; Integration between the Single Reservation system and the Diagnostic Services; Hospital and Territorial Teleradiology Service; Single Reservation Service fully integrated with the electronic payment systems (self-service boxes and POSs); Simplification of the Control process; Rationalization of the Programming process.

The situation is summarized in the following table (Table 2)

Fields of application	
Fields of application in patients management	**Fields of application in personnel management**
Reduction in waiting lists	Reduction in information asymmetry
Reduction in paper material	Improved skills
Reduction in human error	Division of specialist competences
Increased patients safety	Division of labor
More privacy	Fast patients transfers

Source: Our elaboration

3. Results

The introduction of the information system within a hospital structure allows having all the information related to the clinical path of the patient within the structure, available at any point and to all healthcare professionals (at various levels of competence).

This implies a reduction in information asymmetry thanks to the sharing of the patient's medical history by all the authorized personnel of the facility.

This leads to a reduction in the patients' hospitalization time, resulting in an optimal use of the "hospital beds available" resource and in an increased efficiency of the hospital itself. In addition, the use of the IT tool has also allowed for a better division of tasks between the medical and nursing staff, thanks to the computerized management of work plans and workflows.

Finally, the summary view of the information system data has allowed the hospital's management better evaluating the operational efficiency of the facility, and implementing the necessary corrective measures to make it more efficient.

Conclusions

In the information era, equipping oneself with ICT systems capable of managing the enormous data flow inside and outside a company is also a winning strategy in the healthcare sector.

The data analyzed, related to the case study, allowed us getting to general conclusions, starting from the study of a particular case.

This study allowed us identifying, in the computerization process, a method for creating value in the healthcare sector, as well as a tool for improving the quality and management parameters of healthcare facilities. These three aspects are considered separately for purely descriptive reasons, but they are interconnected: improving management means implicitly improving the

quality level of the service in general, thus creating value. The value created is expressed in terms of greater sustainability (rationalization perspective) and outcome improvement (social function perspective), in line with the objectives that the healthcare system must pursue.

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