



Critical information technology issues in Turkish healthcare



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ABSTRACT

While the importance of information technology in reducing soaring healthcare costs and enhancing service quality is increasingly being recognized, significant challenges remain in how it is implemented. Although there are a few studies investigating key IT issues in healthcare in advanced countries, there are virtually none in developing countries. We bridge this gap by investigating the critical information technology issues in healthcare facilities in Turkey. These issues are developed based on the opinions of senior hospital managers. The top ten issues include privacy, quality, security, and the implementation of electronic medical records. Further analyses provide additional insights into the results.

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1. Introduction

Emerging opportunities stemming from the implementation of information technology (IT) and increased competition have forced hospital managers to look for new ways to reduce costs, improve performance, and better serve their patient bases. Greater attention to information technology management issues in the healthcare industry have originated from the role of IT in addressing increasing service complexity, requirements for improving healthcare outcomes, and integrating healthcare delivery systems [47]. IT investment in healthcare is regarded as the driving force behind the reduction of continuously soaring costs and the enhancement of service quality, particularly in developing countries [18]. Healthcare information technologies (HITs) have begun to transform healthcare delivery by improving safety and efficiency, and by creating cost-effective, timely and patient-centered care [67]. In general, however, the adoption rate of information technology in healthcare has remained low, even in advanced nations, compared to other industries in spite of its increasing ubiquity, decreasing costs and potential benefits in clinical decision-making processes [15,31]. One of the main reasons for this phenomenon is the unique structure of the healthcare industry: healthcare institutions differ from other businesses in terms of their operational independence and individual autonomy [36]. In healthcare organizations, physicians

generally have more autonomy, and healthcare payment systems usually do not compensate physicians based on the quality of care they provide. Furthermore, healthcare participants are generally not rewarded for learning and adopting new systems designed to improve the quality of service.

All over the world, healthcare systems are threatened by continuously soaring costs and demand, inconsistent and low-quality care, and poorly coordinated healthcare services [40]. Healthcare spending in every nation is increasing. By 2017, total healthcare spending in the U.S. is expected to reach 20% of GDP, or US\$4.3 billion, with a 7% annual average increase [55]. At the same time, governments around the world are trying to find ways to address the inefficiencies and high costs of providing healthcare to their citizens. In this respect, information technology is regarded as a savior by healthcare providers promising to reduce costs and enhance service quality. However, while IT alone cannot solve all of the problems in healthcare, such as high costs, poor safety and quality, and a largely uninsured population, these problems cannot likely be solved without IT [17]. IT offers many benefits and can give healthcare professionals a greater ability to streamline and standardize processes, as well as to access, share and analyze healthcare and patient information to address the above-mentioned issues [17].

IT investments and the importance of the role of IT in healthcare have steadily increased in advanced countries in recent years [2]. While there is a growing number of publications on IT implementation in healthcare in advanced countries [20,53,64], scientific studies in developing countries are limited. To bridge this gap, this study investigates the critical information technology issues in healthcare facilities in Turkey, a developing country. Due

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to the nature of the health workforce (largely auxiliary personnel) and limited available interventions, health systems and health professionals in developing countries need much more information than those in developed countries, yet they have limited access to evidence-based decision-making tools and support [54]. Efficient access to financial, technical and healthcare information plays a crucial role in improving the living standards of poor people in developing countries. Information technology is the primary enabler in improving access to information and evidence-based decision making. By better understanding the key IT issues, managers of healthcare institutions can make better decisions about healthcare IT investments and adopt effective technologies for their organizations. In addition, high-level policy makers and government officers can define better strategies and policies for their countries' healthcare systems. Understanding the perceptions of senior managers about key IT issues is usually the starting point in this exercise (e.g., [3,42,43]). Therefore, this study answers the following question: *what are the key and pressing IT issues in the Turkish healthcare system from the point of view of senior managers?*

The choice of Turkey for this study is important for several reasons. First, Turkey is a developing country. Although the importance of information technology in Turkish healthcare has been realized and promoted since the beginning of this decade [14], the amount of IT investment in Turkish healthcare has remained much less than 1% of the total investment in healthcare, yet the same figure could easily rise above 3% in advanced nations [7]. Logistical and geographic barriers intensified by financial hardships usually make healthcare unaffordable for much of the population in developing countries [35]. Information and communication technologies have the potential to reduce these barriers by eliminating physical distances, enabling the sharing of limited health resources, and making healthcare affordable and widely available to much of the deprived population. As discussed in detail in later sections, the Turkish Ministry of Health initiated the Turkish Healthcare Transformation Program (THTP) in 2003 to achieve effectiveness, efficiency and equity within the organization and in the delivery and financing of healthcare services. Sahin et al. [57] confirmed that after the THTP implementation, the productivity of Turkish hospitals improved significantly. Much of this improvement can be credited to the widespread implementation of HITs.

Additionally, Turkey is in the process of becoming a member of the European Union (EU) and has served as a bridge between East and West for many centuries. It has an emerging economy with high growth rates in its GDP per capita. Turkey is predominantly Muslim yet secular.

Therefore, defining and evaluating key technological issues in Turkish Healthcare would provide appropriate and valuable lessons for other developing and emerging economies in the allocation and use of limited IT resources.

The article is organized as follows. The next section describes the underlying characteristics of the Turkish healthcare industry, which is followed by a methodology section. The results, analyses, and discussion are then presented, and the final section concludes the paper.

2. Turkish healthcare

As a developing country, the Turkish healthcare industry has unique characteristics compared to healthcare in advanced nations. The Turkish healthcare system has a highly complex structure in which the Ministry of Health, universities and private organizations provide healthcare to patients [50]. Overall, although continuously increasing, the percentage of GDP allocated for healthcare in Turkey is below that of advanced countries. In 2007, Turkey spent approximately 6% of GDP on healthcare,

according to the Turkish Statistical Institution [61]. All Turkish residents have basic public healthcare insurance. According to the Turkish constitution, "Everybody has the right to have social security", and the same provision states that the Turkish government takes necessary measures to ensure social security and the establishment of necessary social security institutions [22]. In addition to state-owned funds, there are private funds for supporting social welfare for employees, particularly those employees working in financial and manufacturing organizations. Turkey has one of the highest per capita expenditures on social welfare services in the world [16]. Traditionally, the government largely provides and pays for all healthcare services because the country has a limited number of social and non-governmental organizations to shoulder the responsibility. The basic international health service indicators, such as infant mortality rate, are continuously improving. Thanks to special government-funded programs that have been in place since the 1960s, the country has progressed a great deal, especially in providing preventive healthcare services, thereby improving its healthcare measures significantly [22]. Moreover, Turkey has a relatively young population. With adequate support, this young population would be a great asset for the healthcare industry. Generally, the major hospitals have adequate instruments and technological infrastructure. Newly established private hospitals are charging competitive prices and offer high-quality advanced services. Therefore, private hospitals have begun attracting patients from Europe and the Middle East [16].

However, Turkey has some potential weaknesses. Although there have been significant recent improvements in Turkish healthcare, the country still lags behind OECD member countries in terms of basic healthcare indicators, such as the number of physicians and nurses per capita [16]. While healthcare expenditures averaged 6.3% of GDP in 2006, Turkey still lags behind other European countries whose healthcare expenditures average 8.9% of GDP [16]. Healthcare services are provided under strict guidance and monitoring by the Ministry of Health. However, healthcare policies are usually defined by populist approaches without reference to real problems and the needs of the country. Furthermore, the traditional structure and culture of health institutions pose obstacles to the development of institutions and the enhancement of services. The general problems in Turkish healthcare are mostly due to adoption and policy. Healthcare providers and policy makers are far from being able to offer large and comprehensive solutions to the country's healthcare problems [60]. Additionally, there exist integration and coordination problems in investment and management. Finally, Turkey spends a significant amount of money on its military due to its risky geopolitical position, thereby limiting the money it can invest in healthcare.

Turkey is not a wealthy country. At the national level, funds allocated to IT investments remain limited. Investments in IT are not only inadequate, but are not planned or coordinated effectively. Furthermore, the country depends largely on foreign suppliers for medicine, healthcare equipment and technical infrastructure. IT hardware and software infrastructure is largely imported and purchased from foreign suppliers. Government guidance and monitoring are limited in this process.

Nevertheless, the Turkish healthcare system is going through an intensive transformation to satisfy EU membership requirements and harmonization processes. Crucial reforms have been carried out in recent years [62]. Turkish healthcare is beginning to take on market-oriented characteristics, such as competition and choice, and patients can now choose among public and private healthcare providers [1]. The major objectives of these reforms are reducing inequality in access to healthcare and narrowing the gap in the use and quality of healthcare services [62]. The Turkish healthcare

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