



## **Chapter XVII**

# **IDEF3-Based Framework for Web-Based Hospital Information System**

Latif Al-Hakim, University of Southern Queensland, Australia

### **Abstract**

---

*This chapter presents a framework for a Web-based hospital information system to manage the surgery-management process (SMP). The framework can be used to manage any other hospital information system processes. The developed framework challenges the traditional hospital Web strategies with a dual aim: first, to improve customer satisfaction in an environment that often imposes unexplained deviation from planned activities, and second, to create a system that is an effective decision-support system for SMP. The chapter identifies factors affecting SMP decisions and employs a descriptive modeling technique known as IDEF3 to map the information flow within and between elements of SMP. The IDEF3 process mapping becomes part of an integrated Web-based system of multiple stages. Each stage has three levels of accessibility. The first level of the Web system is accessible to the public, the second level is accessible to patients and their designated representatives, and the third level is accessible only to hospital professionals.*

## Introduction

---

One of the challenges before healthcare executives is to design systems that improve customer satisfaction when admitting and waiting for consultation or surgery. The term customer in this research refers to patients, their designated relatives, and the hospital's personnel. Healthcare executives are increasingly looking to information technology as an opportunity to develop such systems. One of these technologies is Web-based technology. A large number of hospital Web sites allow customers to download and lodge forms, provide necessary information and feedback to patients, and facilitate the arrangement of appointments. Estimates in 2002 suggest that over 500 million people have access to the World Wide Web (WWW), with 50% to 75% of the users having used the World Wide Web to look for health information (Powell & Clarke, 2002). In December 2001, the NHS (National Health Service) Direct Online Web site dealt with 5.2 million hits from 171,900 visitors to their Web site. The figures for the same period in 2000 were 2.8 million hits and 24,830 visitors (KabelNet.Com, 2002). A survey conducted in Canada to explore patients' attitudes toward health services suggests that Internet users expressed interest in using the Web for several reasons, including to learn about their health condition through patient educational materials (84%), to obtain information about the status of their clinical appointments (83%), to renew prescriptions (75%), to consult with their health professional about non-urgent matters (75%), and to access laboratory test results (75%; Rizo, Lupea, Baybourdy, Anderson, Closson, & Jadad, 2005).

Web-based technology, however, does not routinely achieve customer satisfaction unless, from the customer perspective, a value-added service is created (Al-Hakim, 2006). Web-site design needs to be appropriate to the needs of the hospitals and their patients, and should focus on supporting the hospital's business goals (Thelwall, 2000). The development of Web-site information usability, information flow, and security have been sporadic and uneven across the healthcare industry (Mercer, 2001; Smith & Correa, 2005). This chapter deals with a Web-based system for the surgery-management process (SMP) in hospitals taking into consideration SMP objectives and factors affecting customer satisfaction.

The SMP is a complicated healthcare-delivery process starting from the referral of a patient to a hospital and ending with the discharge of the patient from the hospital after surgery has been performed. One key function of SMP is to manage operating-theatre waiting lists (OTWLs). OTWL refers to the operating-theatre schedule. Patients on this list are awaiting a surgical intervention to be conducted in an operating theatre of the hospital. Operating-theatre lists are of great concern to healthcare executives because of their societal and political priority, their link to potential quality of an individual patient's life, their relation to the economic management of operating theatres and the management of patient flow through the hospital, and the distribution of scarce medical resources, such as specialist surgeons and

24 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/idef3-based-framework-web-based/31166](http://www.igi-global.com/chapter/idef3-based-framework-web-based/31166)

## Related Content

---

### Medical Students' Perspective on TBI after Participation in Interactive Evidence-Based Online Learning

Shivika Chandra and Manu Mathew (2012). *International Journal of User-Driven Healthcare* (pp. 6-11).

[www.irma-international.org/article/medical-students-perspective-tbi-after/68393](http://www.irma-international.org/article/medical-students-perspective-tbi-after/68393)

### Analysis and Linkage of Data from Patient-Controlled Self-Monitoring Devices and Personal Health Records

Chris Paton (2016). *E-Health and Telemedicine: Concepts, Methodologies, Tools, and Applications* (pp. 1635-1644).

[www.irma-international.org/chapter/analysis-and-linkage-of-data-from-patient-controlled-self-monitoring-devices-and-personal-health-records/138475](http://www.irma-international.org/chapter/analysis-and-linkage-of-data-from-patient-controlled-self-monitoring-devices-and-personal-health-records/138475)

### Acoustic Feature Analysis for Hypernasality Detection in Children

Genaro Daza, Luis Gonzalo Sánchez, Franklin A. Sepúlveda and Castellanos D. Germán (2008). *Encyclopedia of Healthcare Information Systems* (pp. 16-22).

[www.irma-international.org/chapter/acoustic-feature-analysis-hypernasality-detection/12917](http://www.irma-international.org/chapter/acoustic-feature-analysis-hypernasality-detection/12917)

### Is Artificial Intelligence (AI) Friend or Foe to Patients in Healthcare?: On Virtues of Dynamic Consent – How to Build a Business Case for Digital Health Applications

Veronika Litinski (2018). *Health Care Delivery and Clinical Science: Concepts, Methodologies, Tools, and Applications* (pp. 1246-1257).

[www.irma-international.org/chapter/is-artificial-intelligence-ai-friend-or-foe-to-patients-in-healthcare/192728](http://www.irma-international.org/chapter/is-artificial-intelligence-ai-friend-or-foe-to-patients-in-healthcare/192728)

### Medical Data Visualization via a Pervasive Multi-Agent Platform

Antonio Coronato, Luigi Gallo and Giuseppe De Pietro (2009). *International Journal of Healthcare Delivery Reform Initiatives* (pp. 68-81).

[www.irma-international.org/article/medical-data-visualization-via-pervasive/40334](http://www.irma-international.org/article/medical-data-visualization-via-pervasive/40334)