

# Chapter 49

## Healthcare Process Development with BPMN

**Elvira Rolón**

*Autonomous University of Tamaulipas, México*

**Félix García**

*University of Castilla-La Mancha, Spain*

**Francisco Ruíz**

*University of Castilla-La Mancha, Spain*

**Mario Piattini**

*University of Castilla-La Mancha, Spain*

**Luis Calahorra**

*General Hospital of Ciudad Real, Spain*

**Rosario Paloma Sánchez**

*General Hospital of Ciudad Real, Spain*

**Teresa Rodríguez**

*General Hospital of Ciudad Real, Spain*

### ABSTRACT

*The importance of the analysis, modelling and management of a business process is not restricted to a specific enterprise sector. In the field of health management, as a result of the nature of the service offered, health institutions' processes are also the basis for decision making which is focused on achieving their objective of providing quality medical assistance. In this work, the authors shall present the application of business process modelling to the processes of a health sector institution, using the BPMN standard notation. The objective of this work is to show the experience obtained in the creation of the conceptual models of certain hospital processes which can be used as a basis for others in collaboration with hospitals in order to model their processes using BPMN. Hospital processes are highly complex, and their graphical visualization facilitates their management and improvement by means of the understanding and detection of possible failures.*

DOI: 10.4018/978-1-61520-670-4.ch049

## **INTRODUCTION**

Business processes enable a company's activities to be described in a manner which is understandable to all its users, with the purpose of analysis and design. Design means explicitly modelling, designing, simulating and redesigning the process as the organization learns what is possible. Owing to the need to respond to competitive pressure or to business opportunities, business analysts need to restructure processes quickly (Smith et al., 2002). This is the reason why the design and modelling of business processes represents one of the most important phases within the life cycle of a process.

In business process modelling the main concepts are the business processes themselves, which describe the activities involved in the business and how they relate to and interact with the necessary resources to achieve a goal for the organization. Some specific goals of business process modelling are: (Beck et al., 2005; Erickson and Penker, 2000):

1. To ease the understanding of the key mechanisms of an existing business
2. To serve as a basis for the creation of appropriate information systems to support the business
3. To improve the current business structure and operation
4. To show the structure of an innovated business
5. To identify outsourcing opportunities,
6. To facilitate the alignment of business specifications with the technical framework that IT development needs.

With regard to the last point, the confrontation of new technologies, more competitive markets, constantly changing business environments and customer satisfaction requirements, have led developers and software presidents, along with business people and organizations in general to

focus upon their processes as a reference point through which to survive and prosper (Florac et al., 1997). This fact has increased the need to analyse, evaluate, measure and improve the processes.

As with all types of organizations, it is vitally important that the health sector keeps its business processes up to date. This objective must not only be achieved through the continuous improvement of the services offered but also as a fundamental part of the quality programs in which it is immersed.

Business processes in hospitals are highly complex and variable, due to the daily work which requires frequent reactions both to the interim results of diagnostic processes and to unexpected medical instructions. When comparing the business processes in a hospital to the processes of other business areas, certain characteristic properties are evident, such as those pointed out by (Amberg and Gräber, 1996): A high number of cooperating organizational units, limited resources (e.g. beds, personnel, devices), a high ratio of manual activities, and the fact that most medical processes can be blueprinted only roughly in advance and details of medical processes are frequently changed.

In a competitive health-care market it is necessary for hospitals to reorganize their structure and operations (Buffone et al., 1996) and become more responsive organizations with a patient service which must be as efficient as possible. Labour, capital and information are therefore critical resources: availability, correctness, and facilities to process information are crucial for an efficient patient service.

Moreover, from the point of view of computer science, the tendency of clinical practice is to move towards a shared care environment in which knowledge of clinical information systems should include definitions of all aspects of clinical processes, in addition to the functions and responsibilities of the people involved in them (Colreavy, 2000). These Clinical or Hospital Information Systems are the artefacts (a combination of technology, data and people) that produce

22 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/healthcare-process-development-bpmn/40688](http://www.igi-global.com/chapter/healthcare-process-development-bpmn/40688)

## Related Content

---

### Auditing Privacy for Cloud-Based EHR Systems

Jonathan Sinclair, Benoit Hudziaand Alan Stewart (2016). *E-Health and Telemedicine: Concepts, Methodologies, Tools, and Applications* (pp. 1465-1487).

[www.irma-international.org/chapter/auditing-privacy-for-cloud-based-ehr-systems/138467](http://www.irma-international.org/chapter/auditing-privacy-for-cloud-based-ehr-systems/138467)

### Towards Detecting Dementia via Deep Learning

Deepika Bansal, \*Kavita Khanna, Rita Chhikara, Rakesh Kumar Duaand Rajeev Malini (2021). *International Journal of Healthcare Information Systems and Informatics* (pp. 1-17).

[www.irma-international.org/article/towards-detecting-dementia-via-deep-learning/279343](http://www.irma-international.org/article/towards-detecting-dementia-via-deep-learning/279343)

### Big Data and Big Data Analytics for Improved Healthcare Service and Management

Pijush Kanti Dutta Pramanik, Saurabh Paland Moutan Mukhopadhyay (2020). *International Journal of Privacy and Health Information Management* (pp. 13-51).

[www.irma-international.org/article/big-data-and-big-data-analytics-for-improved-healthcare-service-and-management/286988](http://www.irma-international.org/article/big-data-and-big-data-analytics-for-improved-healthcare-service-and-management/286988)

### Persistent Complaints After Infection With COVID-19 in Patients Admitted to Jordan Hospital

Ibraheem Y. Qudaisat, Fahad Alansari, Saad Almutairi, Ali H M Alarbash, Salah AlRashidi, Abdulaziz Almutairi, Khalaf Alnowaishri, Abdulrahman Aldousariand Hamad Alazmi (2024). *International Journal of Extreme Automation and Connectivity in Healthcare* (pp. 1-8).

[www.irma-international.org/article/persistent-complaints-after-infection-with-covid-19-in-patients-admitted-to-jordan-hospital/361010](http://www.irma-international.org/article/persistent-complaints-after-infection-with-covid-19-in-patients-admitted-to-jordan-hospital/361010)

### EEMI - An Electronic Health Record for Pediatricians: Adoption Barriers, Services and Use in Mexico

Juan C. Lavariega, Roberto Garza, Lorena G. Gómez, Víctor J. Lara-Diazand Manuel J. Silva-Cavazos (2016). *International Journal of Healthcare Information Systems and Informatics* (pp. 57-69).

[www.irma-international.org/article/eemi---an-electronic-health-record-for-pediatricians/163441](http://www.irma-international.org/article/eemi---an-electronic-health-record-for-pediatricians/163441)