

FACTORS ASSOCIATED WITH BUSINESS PROCESS IN HOSPITAL: A SYSTEMATIC REVIEW

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ABSTRACT

Background: In order to improve the efficiency and effectiveness of company performance, hospitals must be competitive in maintaining service processes. It requires efficient business process. Business process management or business process reengineering must adapt to hospital market segment and avoid complex and fragmented health services. The study aimed to systematically review the factors associated with business process in hospital.

Subjects and Method: This was a systematic review about the management of business processes in the hospital. This study searched articles from two scientific literature databases, namely ProQuest and Scopus. The keywords were “business process”, “business process re-engineering hospital”, and “business process management”. The inclusion criteria were English, scientific journals, papers in conference and proceedings, from 2009-2019, and all international journals. The articles were collected based on PRISMA.

Results: Seven articles met the inclusion criteria. Five articles reported that the involvement of hospital management and the use of business process method influenced the success of business process. Three articles reported that information technology support was closely related to implementation of business process. An article reported the need for a business process team, for the implementation of hospital business process.

Conclusion: Hospital business process is related to management involvement in designing business process. The determination of hospital information system and team cohesiveness are needed in the design and implementation of hospital business process.

Keywords: business process management, business process reengineering, hospital

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BACKGROUND

Hospitals, as complex health services, have problems in the integration and coordination between professionals associated with an increase in the number of specialties and professions, medical services and complex equipment (Ovretveit, 2000).

In general, the quality of health services in Singapore is less than the level of quality expected by patients. 40% of patients interviewed stated that health services were still poor (Lim and Tang, 2000).

In 1993 in America, although more than 40 percent of hospitals were involved in the Joint Commission on Accreditation of Healthcare Organization, most hospitals

provided less than satisfactory services. (Nance, 1995).

In the early 1990s, BPRs became a hot topic that was often discussed in organizational management, creating new ways of making business (Tumay, 1995). Business process management is one of the systematic approaches to improve organizational performance. Business processes reorganize departments and operational activities with a systematic approach to achieving operational quality improvement. However, the main support is to make the organization more competitive by increasing productivity, while at the same time reducing overall costs and advancing business pro-

cesses. Business processes emerge from process orientation, where organizations begin to focus business processes on customers rather than emphasizing functional and hierarchical structures (Reijers, 2006).

Business processes are collections of work that are interrelated to solve certain problems. A business process can be broken down into several sub processes, each of which has its own attributes but also contributes to achieve the goals of the process.

Business process management is a new concept in management that promises many benefits for organizations (Alibabaei et al., 2010). Business process management in various forms has existed for the past 10-15 years. During this time, business process management has developed into holistic management (Bruin and Rosemann, 2005). Business process management is a structured method for understanding, documenting, modeling, analyzing, simulating, implementing and continuously changing end-to-end business processes and all related resources with regard to the organization's ability to add value to the business.

Kolker (2008) stated that business process management has been applied to medical processes such as patient acceptance lines and clinical pathways. For example, the concept of the process has been applied to evaluate the effects of length of stay in patients in the emergency department. According to Huq and Martin (2006) stated that the application of business process management reference models in hospitals can help to develop and implement organizational process management more smoothly.

The process approach has been expanded to include a medical service system into 5 levels. The first level is the clinical process of the patient, from hospitalization to departure. The second level refers to patient care, education and research. The third level defines the allocation of resour-

ces in the hospital and builds a system of medical care. The fourth level describes the resources in the regional medical system. The final level relates to efficiency and the best medical benefits given the limitations of policies, regulations and budgets from a government perspective (Leu and Huang, 2011).

The health care process is very complex, and there is involvement of clinical and administrative tasks, large volumes of data and a large number of patients and employees. The process of health care is also very dynamic (Mmereki and Moruisi, 2013). The health care process requires the cooperation of various organizational units and medical disciplines that are supported by optimal processes.

According to Caccia-Bava et al. (2013), there needs to be commitment from the top management of an organization in leading the implementation of business process reengineering efforts. Commitment is not only from resources (financial, human, tangible and non-tangible), but also through the support they provide to employees who have been given the responsibility to carry out the task (Huang WR et al., 2015). Employees who excel in carrying out business process reengineering efforts must be rewarded so that more employees will be motivated to be involved in implementing the initiative. For example, employees who achieve a higher level of implementation of business process reengineering must be approved and promoted.

Business process management or business process reengineering must adapt to hospital market segments and to avoid the complexity and fragmentation of health services. The purpose of this paper was to explain the factors related to business process management in hospitals.

SUBJECTS AND METHOD

1. Study Design

This systematic review guide referred to the PRISMA (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015. A systematic search was conducted on 2 scientific literature databases, namely ProQuest and Scopus to retrieve peer-reviewed publications from relevant empirical publications. The search term includes business process, business process re-engineering hospital, and business process management.

2. Inclusion and Exclusion Criteria

The first step was screening and abstracting the study which would be used as a reference. If the reference search turned out to be irrelevant and incomplete with the material in question, then it did not belong to the

group. The language restriction used in study reviews was English, original study results, and other scientific papers published in journals, presented at scientific meetings or uploaded on the web. Limitation of studies by looking at business process management in hospitals. The inclusion criterion for this study was that this study was conducted in 2009-2019. The business process in the hospital must be the main outcome. Exclusion criteria were any studies that did not match the above criteria.

3. Data Extraction

Searches on electronic databases were filtered to identify studies that include relevance for reference. Then the data was made into a structured table.

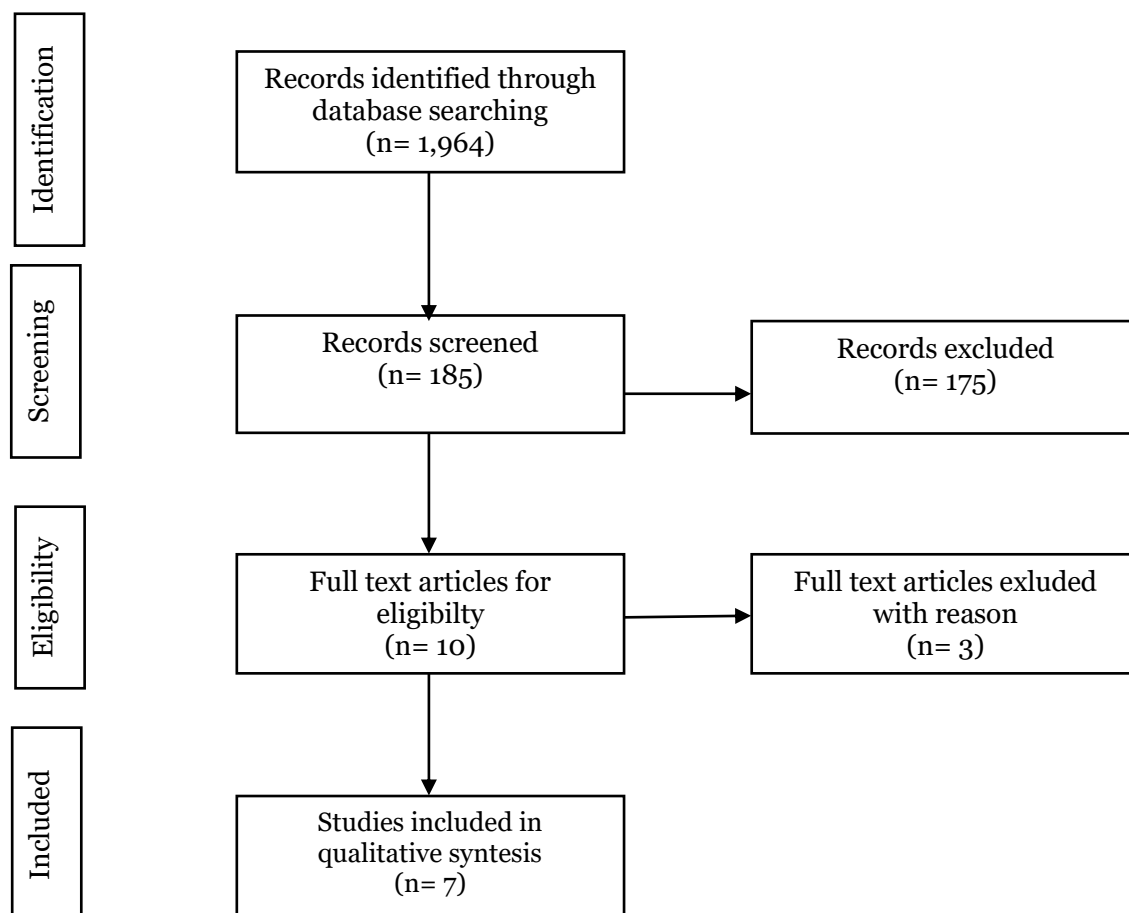


Figure 1. PRISMA of Systematic Review

RESULTS

Number of systematic review articles

From the search results, a total of 1964 records were identified from 2 databases. After identifying 185 articles, 175 articles were excluded. The remaining 10 articles were assessed for eligibility, 3 articles were excluded. The review examined the factors related to business processes in hospitals and only 7 articles that fulfilled the objectives of this study.

Factors related to business processes in hospitals

From 7 research results, it showed the factors that associated with business processes in hospitals, then categorized into 4 general categories. These categories were management, process/implementation, IT and team.

From the table above, it can be concluded that of the 7 articles in this systematic review, 5 articles stated that the involvement of hospital management influenced the successful implementation of business processes. Five articles stated that determining the use of business process methods or information technology support mentioned in the 3 articles was closely related to the design and implementation of business processes. One article stated that there a business process team was needed in implementing hospital business processes.

DISCUSSIONS

Business process management and business process reengineering have become a number of hospital management tools implemented by organizations to enhance business competitiveness. Several studies have discussed this business process regarding influencing factors.

The results of this systematic review highlighted 4 categories of influence factors related to business processes in hospitals,

namely management, implementation or engineering, IT and team. This study illustrated the factors that influence business processes in hospitals.

Management

The results of the study have stated that management was a factor related to the implementation of business processes in hospitals. This was one of the main factors associated with business processes which constitutes most of the studies discussed in these factors. From 5 studies, it was concluded that management factors or the existence of support by top management was one of the successful implementation of business processes (Mmereki and Moru-isi, 2013).

The managers involved agreed that the business process project has wide benefits for the company (Caccia-Bava et al., 2013). The participation of doctors and nurses strengthens harmony with reformed and reduced organizational resistance, then conducting expert interviews with senior managers can improve hospital processes through business processes (Leu and Huang, 2011; Doosty et al., 2014). Project management was needed by most Business Process Management frameworks and the availability of maintenance process management guidelines was still small (Helfert, 2009)

Process or Implementation

There were 5 articles that stated that process factors were related to business process implementation. The business process reengineering team clearly identified important processes and their relationships. Each process was well understood and how the process was carried out. The added value for the company from each process was well understood (Doosty et al., 2014).

Table 1. Articles reviewed in this study

No	Author (Year)	Title	Country	Result	Conclusions
1	Nmerekhi and Moruisi (2013)	Challenges In Implementation of Business Process Re-Engineering in Botswana Public Hospitals	Botswana	The key factors driving the success of BPR are top management and an understanding of hospital management that was aligned with the urgency of discussion. Change management was fundamental in BPM.	The importance of structure and content and a thorough understanding of the BPM project.
2	Bertolini et al. (2011)	Business Process Re-Engineering in Healthcare Management: A Case Study	Italia	Using the Delphi methodology to identify a number of areas for improvement: number of operating sessions, operating room preparation for each operation, and availability of special surgical instruments. In addition, a discrete event simulation approach produced an understanding of the most efficient management choices.	The totality of BPR results was the involvement of all parties in the health service. Documenting how to work or process for clarity and transparency in order to prevent deficiencies related to lack of process visibility.
3	Caccia-Bava et al. (2013)	Important Factors for Success In Hospital BPR Project Phases	America	The success of BPR was that there were 5 different groups dealing with BPR: the compactness of the project team; the process used by the project team to implement BPR; the expertise available to the project team regarding the redesigned/ reengineered process; IT support extended to the project; and project leadership and motivation.	General hospital administrators and BPR leaders in particular were needed to focus on items that make up groups to handle BPR implementation.
4	Gomez et al. (2018)	Introduction BPM Approach in Healthcare and case study of end user interaction with EHR interface	Portugal	The BPMN workflow diagram produced 4 main EHR modules, one of them was an outpatient module. The BPMN approach to process management impacts organizations at different levels such as: increasing the level of quality in service, easier learning by new users, reducing costs and identifying losses or waste, and greater interoperability, that is, increased ability to communicate with other external systems, which would facilitate the exchange of business process information with other management tools	The adoption of BPMN by organizations in modeling the process of growing fast, which resulted in the satisfaction of users who work with this notation. Benefits at the organizational level, for example, by improving the quality of their services and products economically, because organizations can reduce costs and detect the possibility of unnecessary things

No	Author (Year)	Title	Country	Result	Conclusions
5	Doosty et al. (2014)	Improvement of hospital process through business process management in Qaem Teaching Hospital: A Work in Progress	India	The results of the BPM implementation showed a significant increase in the chosen process	Health care reform has led health care organizations to focus on streamlining processes in order to provide high quality care while at the same time reducing costs. Major progress was achieved through the concepts of business processes, business process orientation and business process development
6	Markus Helfert (2009)	Challenges of Business Process Management in Health Care. Experience in The Irish Healthcare Sector	Ireland	The importance of reducing health care costs and streamlining workflows, processes and lines of care was increasingly being recognized seriously. However, despite the importance of process management, at present, very few guidelines were provided to introduce health care management processes in hospitals internationally	The importance of structure and content and thus the BPM project required a comprehensive understanding of common issues
7	Leu and Huang (2011)	An Application of Business Process Method to The Clinical Efficiency Hospital	Taiwan	Internal indicators of the number of observations remaining, occupancy rates in beds, and nursing hours were improved by the BPM project	Although the improvement in medical quality indicators was not significant in the case of this hospital, the BPM project still brought several benefits

Value analysis and core process analysis can be carried out by using a top-down approach, because the executive has a hospital management review. However, it is recommended that sub-detailed and detailed process analyzes were carried out using a bottom-up approach, because it was the medical staff who regulated the flow of patients and who have sufficient information about real problems in the field (Leu & Huang, 2011).

The process improvement project was carried out in four phases namely, identifying the current situation and priority processes, modeling the selected process, identifying the problem, summarizing and improving the selected process, summarizing and completing documentation of the selected process (Doosty et al., 2014).

The Business Process Re-engineering (BPR) implementation started from identifying strategic objectives and new representations using a mapping process of how the company worked (Bertolini et al., 2011). The percentage of BPR implementation in the study of Caccia-Bava et al (2013) was 23% of the overall stages of the activity which was the process analysis phase where the BPR team identifies the process and each process was well understood about how the process was carried out.

In the research of Gomes et al. (2018) it stated that in implementing Electronic Health Records (EHR) in the context of optimizing health services, Porto Hospital management used the Business Process Management Notation (BPMN) application to standardize processes and is the most widely used process management practice by current organization. Improving the hospital management process by using BPMN was not only be a factor in organizational

success in the short and long term, because it can be a factor of improvement in services provided by doctors and nurses that contribute to improvements in the treatment of patients from other institutions, as well as research organizations. BPMN's approach to process management would have an impact on improving the level of service quality, easier learning by new users, cost reduction and identification of losses or waste that occur and greater interoperability, which was increasing the ability to communicate with other external systems, which would facilitate exchange business process information with other management tools.

Technology Information

Hospital challenges related to technology are information fragmentation (Mmereki and Moruisi, 2013). The existence of an integrated patient flow, medical data and performance management in health service management lead to effective service process. Three sub processes using Business Process Management Notation (BPMN) were identifying checking, working and notification.

Identification checks were used to confirm user identification and to take user commissions for further sub-processes. Work sub-process (user management) worked when identification was successful after checking. The Job sub-process classified users into three basic categories, based on their use, the level of security permits and the functional tasks of the process. Notification was a system that checked whether the work process was complete, the announcement process would begin the process of sending a message service and then notifies those who must receive notifications (Leu and Huang, 2011).

BPR tools support the "re-thinking" of business processes and workflow

management systems were software applications that allow this re-engineering process to be possible. EPC is a business process modeling technique, mainly used to analyze processes for ERP implementation purposes (Bertolini et al., 2011).

Team

The percentage of team cohesiveness in BPR implementation was 26% in the BPR implementation phase and there was good cooperation and support from all parties involved in ensuring the process run smoothly (Caccia-Bava et al., 2013).

Business process management was one of the hospital tools to improve hospital performance. When the business process management will be implemented in a hospital, make sure top management is involved in designing business processes. In addition, the stages of the business process implementation process are also considered. Team cohesiveness is also needed because there are big changes when the business process is carried out.

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