Inhibiting Factors Integration of Various Information System in Hospital

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ABSTRACT

Hospitals have diverse information/application systems, such as patient information systems, clinical information systems, laboratory information systems, radiology information systems, pharmaceutical systems, patient registration applications and other information systems. With the implementation of the integration between systems, it will provide the benefits obtained, namely a fast and accurate reporting process, facilitate operational services, establish effective communication between entities, facilitate access to patient information and up-to-date medical knowledge. However, there is still very little integration between information systems within the hospital environment. A study said only 34.78% of hospitals in the Semarang area and 36.62% of hospitals in the Yogyakarta area had already integrated between existing systems. Considering the many benefits obtained from integration, therefore it is necessary to identify the inhibiting factors in the integration process. The method used is to review some of the literature relating to hospital integration in Indonesia. The literature search is done with the Google search engine. The keywords used are the integration of health services and the integration of hospital information systems. The literature chosen is literature that discusses integration in Indonesia, while the literature that discusses the situation outside Indonesia is not included. After getting the literature, then the categorization of the factors that inhibit or cause various information systems in the hospital are not integrated. The results obtained are two factors that most influence the integration process between systems, namely standardization, human resources, leader and finance.

I. Introduction

Implementation of Information Technology (IT) in the field of health, especially in Indonesia continues to grow. This is proven by Sanjaya's research [1] on hospitals in Semarang that 91.30% of hospitals have used information systems, where the most dominant is the administration and billing functions. The use of IT has also been directed towards clinical functions such as pharmaceutical information systems (60.87%), laboratories (60.87%) and radiology (43.48%). However, only 34.78% of hospitals have integrated between existing systems. Likewise, Sumarsono's research on hospitals in Yogyakarta showed that 36.62% of hospitals agreed with interoperability between systems and the rest disagreed [2].

Integration in the health sector in Indonesia, particularly hospital organizations, is an interesting discussion. Hospital organizations have diverse information/application systems, such as patient information systems, clinical information systems, laboratory information systems, radiological information systems, pharmaceutical systems, patient registration applications and other information systems. The implementation of inter-system integration will provide the benefits obtained, namely a fast and accurate reporting process, facilitating operational services, establishing effective

communication between entities, making it easy to access patient information and up-to-date medical knowledge.

Integration is a process of combining or uniting data from different sources. Integration is carried out to support the smooth business process of an agency. The need for data integration arises when management wants a fast and accurate monitoring and reporting process [3]. Integration can be in the form of data integration, namely the exchange of data between different systems or application integration, that is sharing functions from one system to another.

With the many advantages of implementing integration, there should be quite a number of hospitals that have integrated various existing information systems. However, the data shown is only one-third of the number of hospitals that have integrated. Therefore, further identification is needed about the factors that hinder the integration of various information systems in the hospital. So that it can be used as a reference for research related to integration in hospitals.

II. Research Method

This research reviews a number of related literature on integration in the hospital environment. Literature search uses keywords Health service integration and hospital information system integration. The selected literature is literature that discusses integration in Indonesia, while literature that discusses conditions outside Indonesia is not included.

After getting the literature, then categorizing the factors that hinder or cause various information systems in the hospital is not integrated. The following is Figure 1 of this research step.
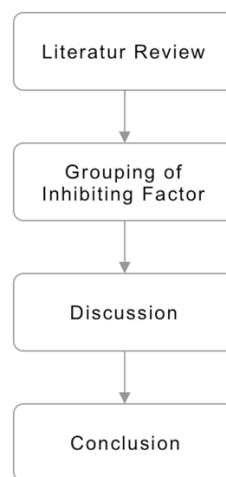

Fig. 1. Research step

III. Discussion

In accordance with the steps of the study, the grouping of literature is presented using a table with four columns. These columns are number, the title of literature, author and year of publication. In this study, the literature reviewed was seven articles as in table 1

Table 1. Literature

No	Title	Author	Year
1	Manajemen Rumah Sakit Berbasis Arsitektur Berorientasi Service (SOA), Untuk Mewujudkan Pelayanan Prima Bidang Kesehatan Rumah Sakit di Indonesia[4]	Aries Muslim, Cut Maisyarah Karyati	2011
2	Implementasi Integrasi Data Antar Sistem Informasi Untuk Mendukung Decission Support System[3]	Mugi Sugiarto, Pelita Fajarhati	2008

No	Title	Author	Year
3	Implementasi Service Oriented Architecture dalam Rekayasa Pengembangan Electronic Health Record Pada Praktik Dokter di Kota Magelang[5]	Kuntjoro	2011
4	Integrasi Data pada Heterogenitas Sumber Data Kunjungan Rawat Jalan di Puskesmas D.I.Yogyakarta[6]	Ani Rowiani	2012
5	Sistem Informasi Rumah Sakit : Kemana arah penggunaannya[7]	Guradian Y Sanjaya, Annisa Ristya Rahmanti, Priyo Anggoro, Ankie Aulia	2013
6	Evaluasi Sistem Informasi Manajemen Rumah Sakit Tahun 2015[2]	Surahyo Sumarsosno	2015
7	When more is less: The case of disconnected information systems in Indonesian public health facilities[8]	Fathul Wahid, Raden Teduh Dirgahayu, Almed Hamzah, Hari Setiaji	2017

The first literature describes the factors that hinder the success of integration, namely the gradual implementation of information systems, the standards used in implementing different systems, financial limitations, leadership, organizational vision and human resources. The second literature explains the inhibiting factor is uniting management agreement on business processes in integration.

The third literature explains obstacles in integration are a matter of the similarity of standards used. Sometimes there are still systems in Indonesia that are not accommodated to international standards in the process of exchanging data to achieve integration between systems. The fourth literature explains the inhibiting factors are vendors who develop a variety of systems in different hospitals, the incomplete availability of data for the integration process, human resources, and the lack of established dataset standards.

The fifth literature explains many applications are stand-alone, network limitations, and hospital funding limitations. The last literature describes factors that hinder integration, namely infrastructure limitations and human resource problems in hospitals that handle IT not from an informatics engineering background. The seventh literature finds three problems that make the information system disconnected. Sectoral ego, developers of new information systems always start from scratch and The report format.

After reviewing all seven of the literature, then grouping the inhibiting factors and writing them into a table. Table 2 is the result of the grouping done. Based on table 2, it is found that the most factors that hinder the smooth integration of various information systems in hospitals are standardization, human resources, leader and finance. Standards and natural resources are mentioned in four works of literature, human resources three literature, leader and financial factors are mentioned in two literatures.

Standardization is an important factor in implementing integration. Without a standard agreement as to what and what standard, of course it will be difficult between systems to communicate with each other. Standardization can be related to standards in the format of data exchange, standards in the technology used, standards for the application structure or standards in the software used. This is in accordance with Mbaubedari's statement [4] that Indonesia has not adopted the standard for electronic health data exchange, clinical data and nursing. This is closely related to the factors mentioned by Rowiani [5] that vendors who develop information systems are different.

Second is human resources. It is undeniable, the role of human resources is very large. To integrate various existing information systems, an expert in the field of integration design is needed. An expert plays a role in identifying the current information system, then devising how the integration is desired and analyzing the gaps so that the steps taken are clear and directed. In addition to consultants, it also requires people who have IT background in the implementation of technical integration and operation. It will be very inhibiting if the people who work handling information systems in hospitals are not from IT background, as the results of Sumarsono's research [6] the background of human resources managing hospital information systems with 40.85% medical record education background, informatics engineering 35 %, economy 29.58% and the rest come from computer science, paramedics and public health sciences.

In addition to the two factors above, standardization and human resources, leader and financial factors are also very influential in the smooth integration. Middle-class hospitals will certainly allocate funds for other primary needs first, such as improving the hospital's physical facilities, medical devices or machines in the laboratory. In addition, to get a consultant who designs so that several systems can be integrated, it takes a lot of costs/salaries, as well as costs for technicians who work on integration. Table 2 below is the result of grouping factors that hinder the integration of the seven works of literature

Table 2. Inhibiting factor

Table Head	Table Column Head						
	1	2	3	4	5	6	7
1. Management							
a. Leader	v						v
b. Vission mission	v						
c. the similarity in the business process		v					
d. Finance	v				v		
2. Information system							
a. Stand alone					v		
b. Gradual	v						
c. Standardization	v		v	v			v
d. Data availability				v			
e. Different vendors				v			
f. Start from scratch							v
3. Infrastructure							
a. Network availability					v		
b. Infrastructure						v	
4. Human resources							
a. Human resources	v			v		v	

From the results of the study, it was established that that could be almost the smooth process of integration of various information systems from within the hospital itself. Human resources, leader and financial factors can be overcome by the hospital itself. While the standardization factor is one that researchers or vendors must think about for the sake of ease of integration in the future. Although the various systems are developed from different vendors, they have a standard in common terms of interchangeable data structures or others.

IV. Conclusion

The conclusion of this research has been as expected, namely the identification of factors that hinder the implementation of the integration of various hospitals in Indonesia. These factors are a matter of standardization, human resources, leader and finance. After obtaining the results of this identification, it is hoped that in future studies it will discuss the issue of standardization in Indonesia. Why do not have a standard, and what solutions are offered to the problem of these standards.

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