
Development Of The Jakarta Hajj Hospital Financial System Based On The Open Group Architecture Framework (Togaf) Approach

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Abstract

Financial management is a vital component in supporting hospital operations. Jakarta Hajj Hospital faces challenges in the form of an incompletely integrated financial system, manual processes that are prone to human error, and a lack of clear technological architecture guidelines. This study aims to design an integrated financial information system architecture using The Open Group Architecture Framework (TOGAF). The method used is qualitative with the TOGAF Architecture Development Method (ADM) approach that includes the Preliminary phase to Architecture Change Management. Data collection was carried out through observation, interviews, and literature studies. The results of this study are a blueprint of business architecture, data, applications, and technology that integrates BPJS claims management, financial reporting, and patient transactions. The contribution of this study is the provision of strategic guidelines for digital transformation to improve operational efficiency, transparency, and security of financial data at Jakarta Hajj Hospital.

Keywords: *Enterprise Architecture, Financial Information Systems, Hospitals, TOGAF ADM, BPJS Health.*

INTRODUCTION

In the modern healthcare service ecosystem, structured, efficient, and transparent financial management is a vital aspect that not only supports operational sustainability but also determines the quality of services delivered to patients. Haji Jakarta Hospital, as one of the leading healthcare institutions, faces managerial challenges in which the current financial system has not yet been fully integrated, resulting in slow data management processes and vulnerability to inaccuracies. This suboptimal information technology infrastructure often hinders operational efficiency, increases the risk of transaction recording errors, and makes it difficult for management to prepare precise financial reports for strategic decision-making within the institution.

Responding to the urgent need for digital transformation, the implementation of enterprise architecture becomes a strategic solution to align business processes with information technology. This study adopts The Open Group Architectural Framework (TOGAF) as the main framework due to its ability to provide a systematic and comprehensive method for designing, planning, and managing enterprise information architecture. Through this approach, the study aims to develop a financial system architecture that not only addresses current data fragmentation issues but also has the flexibility to adapt to regulatory changes in the healthcare sector and future technological developments. The novelty of this research lies in the detailed design of integration between the hospital's internal financial system and external systems such as BPJS Kesehatan, which is intended to accelerate the claims process and maintain the stability of the hospital's cash flow.

Along with the demands of digital transformation, the need for a structured, adaptive, and information technology-based financial system has become increasingly urgent. This approach is believed to help institutions design and implement systems that not only meet current needs but are also prepared to face future challenges. The development of a TOGAF-based financial system architecture at Haji Jakarta Hospital is expected to provide a strategic solution by integrating financial processes, enhancing data security, and providing fast and accurate access to financial information, and. This initiative also supports the hospital's efforts to achieve better financial governance in order to improve the overall quality of healthcare services. Therefore, this research represents an important

step in supporting digital transformation within Haji Jakarta Hospital, particularly in the field of financial management.

RESEARCH METHODS

This study applies a qualitative method with a descriptive approach to design a comprehensive financial information system architecture. The framework used as the main foundation for architectural development is The Open Group Architecture Framework (TOGAF) with the Architecture Development Method (ADM) cycle. The selection of this method is based on its ability to provide a systematic structure for aligning business strategy with information technology, as well as its flexibility in modeling complex system integration.

The data collection stage began with direct observation of objects and phenomena occurring in the hospital environment. The researcher was directly involved in the field to observe operational workflows in related units, particularly in the finance, registration, and medical service departments. This observation aimed to map the current system condition (As-Is), identify physical and procedural obstacles in financial data management, and validate inter-departmental information flows that often become sources of inefficiency.

In addition to observation, data collection techniques were strengthened through the distribution of questionnaires and interviews with stakeholders. The questionnaires were prepared based on predetermined sampling criteria and distributed to staff and management to explore users' perceptions of the performance of the current system. Interviews were conducted to obtain deeper qualitative data regarding specific needs, managerial challenges, and strategic expectations for the development of a new system, which were then processed to determine the most accurate data samples as the basis for system design.

As illustrated in Figure 1, the diagram explains the research workflow currently being observed, serving as a reference for architectural research in hospitals. Through this approach, the study becomes more focused and is able to identify more quickly the key problem areas that must be addressed by the hospital concerned.

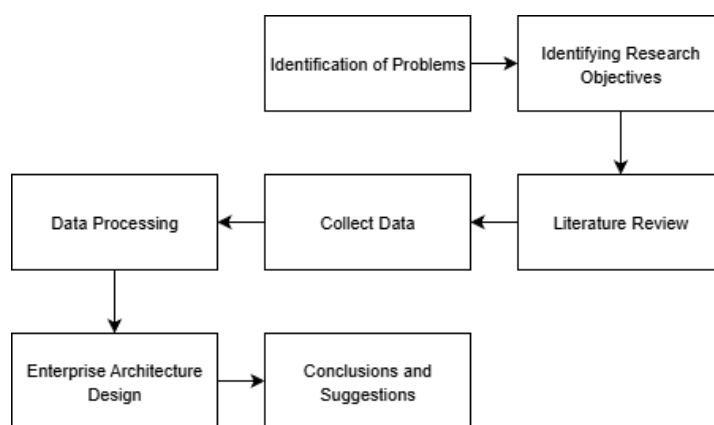


Figure 1. TOGAF Research Flow

To strengthen the theoretical and practical foundations, this study also employed a literature review method. The authors reviewed various credible reference sources, such as books, academic journals, and TOGAF technical standard documents, to obtain a relevant theoretical framework. In addition to external literature, a documentation study was also conducted on internal documents of the Jakarta Haji Hospital, including Standard Operating Procedures (SOPs) and previous financial reports, to understand the internal regulations and bureaucratic processes that must be accommodated in the new system architecture. In the data analysis phase, this study employed a combination of qualitative and comparative analysis. For the technical operational evaluation, a SWOT (Strengths, Weaknesses,

Opportunities, Threats) analysis was used to map the organization's strategic position, and a PIECES (Performance, Information, Economics, Control, Efficiency, Service) analysis was used to detect specific weaknesses in the legacy system.

RESULTS AND DISCUSSION

In the operational management analysis section, the discussion focuses on an in-depth evaluation of the current financial system ecosystem (As-Is) at the Jakarta Hajj Hospital. Through the application of strategic analysis methods such as SWOT and PIECES, this study successfully identified several crucial obstacles, ranging from inefficiencies due to predominantly manual processes to issues of data fragmentation between units that hamper real-time reporting. The findings from this operational analysis then served as an empirical basis for formulating the requirements for a more adaptive and integrated target system (To-Be). Next, the Preliminary Phase, which is the foundational step in the TOGAF ADM framework, prepares for architectural transformation. In this phase, the study establishes a strategic framework by defining architectural principles, development scope, and comprehensive identification using the 5W+1H approach.

Operational Management Analysis

This section presents the results of the enterprise architecture design for the Jakarta Hajj Hospital, beginning with an analysis of current operational conditions. Next, the architecture blueprint, systematically developed using the TOGAF framework, is presented.

SWOT Analysis

The analysis conducted was to analyze the strengths, weaknesses, opportunities, and threats in hospital management, as seen in Table 1.

Table 1. SWOT Analysis of the IT Sub-Division of the Jakarta Hajj Hospital

Strengths	Weaknesses	Opportunities	Threats
Structured Framework	Implementation Complexity	Digitalization Development	Resistance to Legacy System Changes
Focus on Integration and Transparency	Need for Competent Human Resources	Improved Operational Efficiency	Dependence on System Vendors
Scalability and Flexibility	Infrastructure Implementation Costs	Support for New Technology Adoption	Regulatory Policy Changes
Global Standard Support	Compatibility Adaptation with Legacy Systems	Increased System Credibility	Technology Security Risks

PIECES Analysis

A PIECES analysis (Performance, Information, Economic, Control, Efficiency, Service) was conducted on the operational management process at the Jakarta Hajj Hospital. This model is used to classify problems, opportunities, and directives contained in the scope definition section of the system analysis and design. This can be seen in Table 2.

Table 2. PIECES Analysis of the IT Sub-Division at the Jakarta Hajj Hospital

No	Identification	Problem Description	Solution Description
1	Development of TOGAF-Based Hospital Financial System Architecture (Sutabri, 2017)	The existing system often experiences delays in processing financial data.	Uses a real-time approach to support decision-making.
2	Analysis of TOGAF-Based Hospital Financial System Requirements (Widyastuti & Sutabri, 2019)	Financial information is scattered, causing redundancy, inaccuracy, and synchronization difficulties.	Integrating financial data into a single platform enables more consistent information.

3	Development of TOGAF- and COBIT-Based Hospital Financial System Architecture (Rahmawati & Sutabri, 2018)	Manual processes and inefficient systems increase operational costs.	TOGAF implementation improves the efficiency of financial information systems.
4	Analysis of TOGAF- and ITIL-Based Hospital Financial System Requirements (Sari & Widyastuti, 2020)	Reporting processes take a long time and are mostly performed manually using non-integrated applications.	A TOGAF-based system integrates all reporting processes into a unified framework.
5	Development of TOGAF- and BPMN-Based Hospital Financial System Architecture (Prasetyo & Sutabri, 2019)	Financial information is distributed across multiple divisions with different data formats, causing redundancy.	The system integrates all financial information into a single platform, enabling more consistent data.
6	Analysis of TOGAF- and UML-Based Hospital Financial System Requirements (Widyastuti & Sari, 2020)	Manual processes and inefficient systems increase costs.	TOGAF implementation reduces errors in the financial system.

Data Matrix Analysis

This comparison matrix analysis aims to identify strengths, gaps, and opportunities for improvement among the analyzed elements, allowing management to make more effective strategic decisions, as seen in Table 3.

Table 3. SWOT Analysis of the IT Sub-Division of the Jakarta Hajj Hospital

No	Identification	Description
1	Development of TOGAF-Based Hospital Financial System Architecture (Sutabri, 2017)	TOGAF-based hospital financial system
2	Analysis of TOGAF-Based Hospital Financial System Requirements (Widyastuti & Sutabri, 2019)	TOGAF-based hospital financial system requirements
3	Development of TOGAF- and COBIT-Based Hospital Financial System Architecture (Rahmawati & Sutabri, 2018)	TOGAF- and COBIT-based hospital financial system
4	Analysis of TOGAF- and ITIL-Based Hospital Financial System Requirements (Sari & Widyastuti, 2020)	TOGAF- and ITIL-based hospital financial system requirements
5	Development of TOGAF- and BPMN-Based Hospital Financial System Architecture (Prasetyo & Sutabri, 2019)	TOGAF- and BPMN-based hospital financial system
6	Analysis of TOGAF- and UML-Based Hospital Financial System Requirements (Widyastuti & Sari, 2020)	TOGAF- and UML-based hospital financial system requirements

Preliminary Phase

The architectural design process is initiated through a preliminary phase, which emphasizes organizational readiness and establishing project boundaries and frameworks. This stage establishes two crucial foundations that will be described in the following sections.

Identification of 5W + 1H for Architectural Design

The purpose of identifying 5W + 1H is to explain and identify the objects involved in architectural design. The following is a 5W + 1H table identifying the objects in the architectural application for the Jakarta Hajj Hospital, which can be seen in Table 4.

Table 4. 5W + 1H for Architectural Design

No	Identification	Description Explanation
1	What	Scope of enterprise architecture
2	Who	Who makes the design of enterprise architecture models
3	When	When is the research completion time
4	Where	Where is the location of the research object taking place
5	Why	Why should you take enterprise architecture research design
6	How	Determine how the design is created

Architecture Vision

The financial system architecture is designed to align with the strategic objectives of the Jakarta Haji Hospital, including operational efficiency, financial reporting accuracy, and compliance with healthcare regulations. To achieve this vision, business and technology needs are aligned to provide added value for key stakeholders, including hospital management, financial staff, and patients.

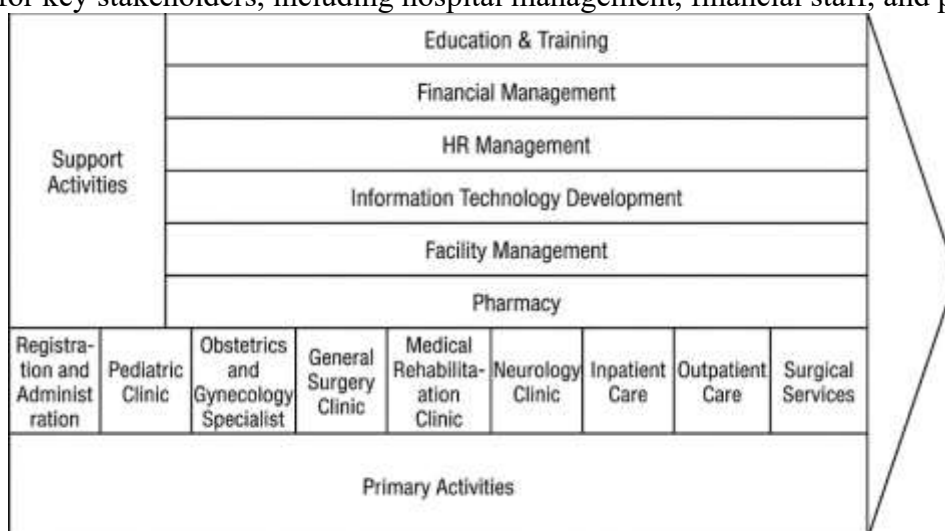


Figure 2. Value Chain Analysis of the Jakarta Hajj Hospital

Business Architecture

This phase focuses on designing the target business architecture for the IT Sub-Division to realize the established vision, which includes documenting the organizational structure and proposed (to-be) business processes.

Business Architecture Overview

Focuses on an in-depth analysis of the existing business structure and processes to design a more efficient target operational flow for the Jakarta Hajj Hospital's financial system. This phase aims to map key activities such as budget management, financial reporting, and the BPJS claims flow to identify operational bottlenecks and align business needs with the information technology strategy. Through this approach, the business architecture is designed to eliminate error-prone manual processes and create an integrated, transparent work environment that supports the hospital's strategic decision-making.

Organizational Structure of the Jakarta Hajj Hospital IT Sub-Division

The organizational structure of the Jakarta Hajj Hospital implements a hierarchical and structured corporate governance pattern, led by the Board of Commissioners, which holds a strategic oversight function, and the Company Director, who is responsible for general corporate management. This is shown in Figure 3.

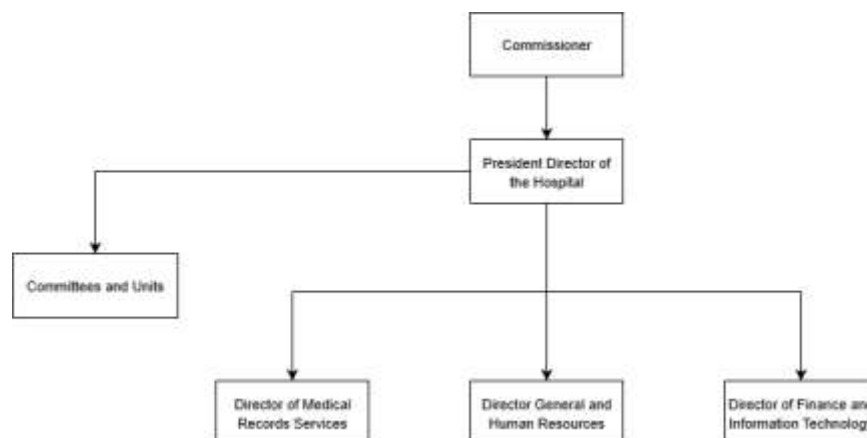


Figure 3. Organizational Structure of Jakarta Hajj Hospital

Current Business Process Analysis (As-Is)

The analysis of the current business processes (As-Is) at Jakarta Hajj Hospital focused on mapping the ongoing operational workflow to identify weaknesses and efficiency barriers. Based on modeling results using BPMN notation, it was found that the financial management system is still dominated by manual procedures and fragmented applications, with no real-time data integration between medical service units and the finance department.

This situation results in redundant data input, a heavy reliance on the transfer of physical documents between units, and bureaucratic complexity in verifying insurance claims and applying for fee waivers. This fragmentation not only slows the revenue cycle but also increases the risk of human error, highlighting the urgent need for a transformation towards an integrated system architecture.

Currently, the process of summarizing patient discharge costs still relies heavily on manual file collection from treatment rooms to the cashier. This reliance on physical documents often leads to delays in billing information and long queues at discharge, as financial officers must manually re-verify each case one by one to ensure compliance between the medical treatment provided and the charges charged (as seen in Figure 4).

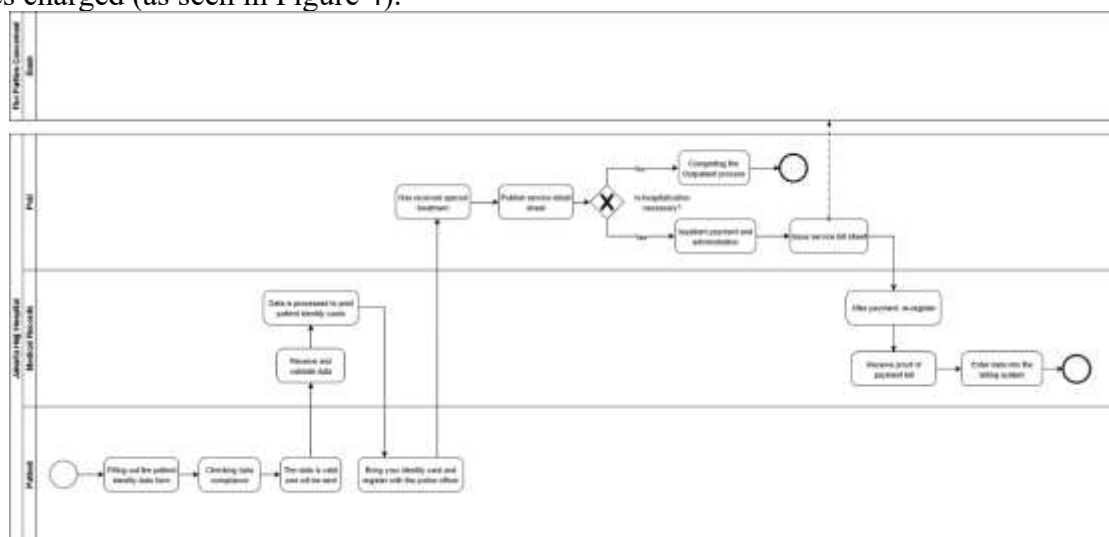


Figure 4. Diagram As-Is of the Inpatient Revenue Collection System

Figure 5 shows the existing procedures for managing non-operational revenue derived from the rental of hospital facilities and equipment. This process was identified as being partially managed and not yet fully integrated into the main financial system.

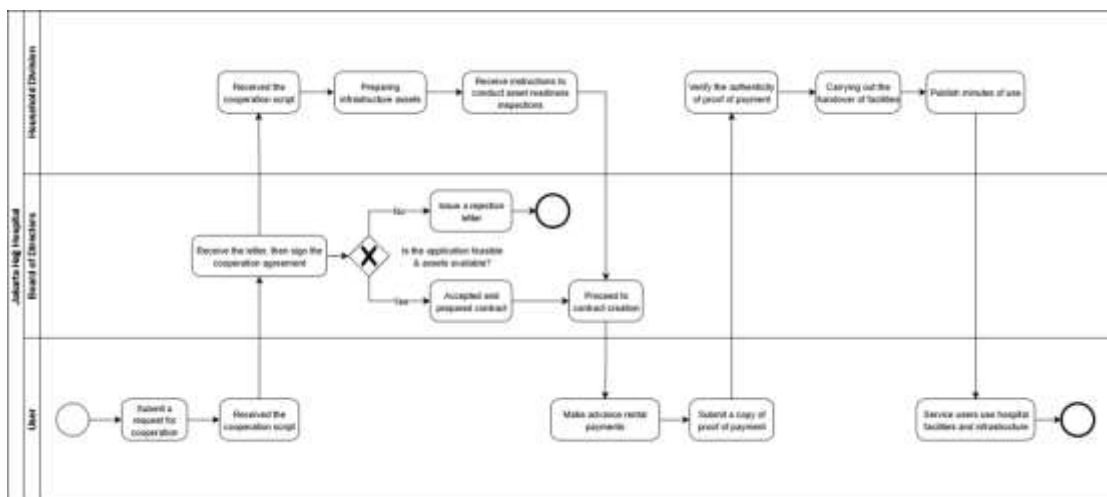


Figure 5. Diagram As-Is of the Non-Operational Income Receipt System for Facility Rental
 Figure 6 describes the administrative service mechanism for patients with insurance (ASKES, LKS, BBM) and the current flow for requesting income reductions. It is clear that the process for verifying participant eligibility and approving fee dispensations involves a lengthy manual bureaucratic chain between units.

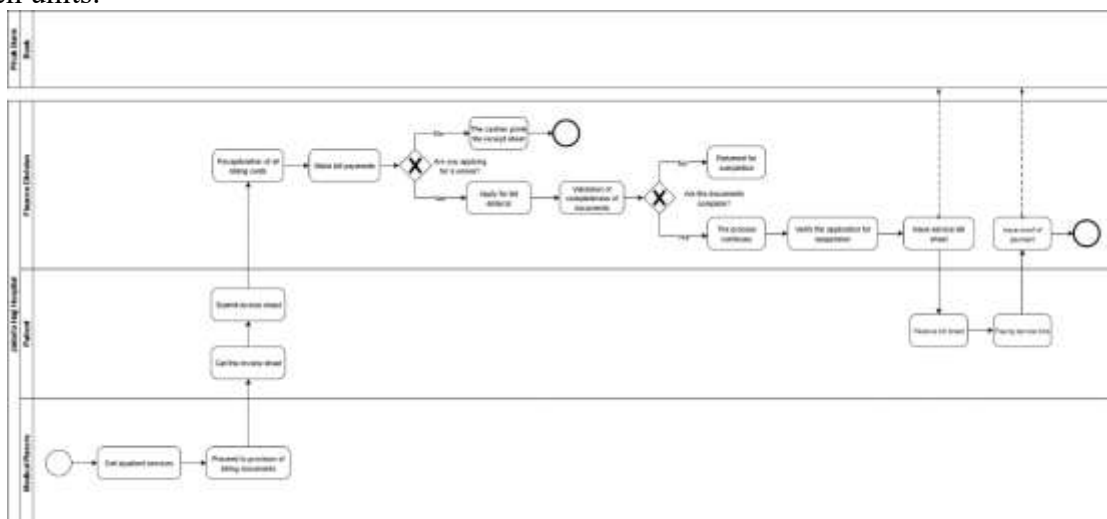


Figure 6. Diagram As-Is of the ASKES, LKS, BBM, and Revenue Reduction Receipt Systems
Proposed Business Process Design (To-Be Business Process)

The proposed business process analysis (To-Be) is designed as a strategic solution to address inefficiencies in the current system, with a primary focus on digital transformation and comprehensive data integration. In this target architecture, operational workflows are reengineered to eliminate silos between units through database centralization, where medical procedure data entered in service units is directly connected in real-time to the billing system and accounting module. This design also adopts an automation mechanism through a bridging system with external insurers (such as BPJS), significantly reducing manual administrative bureaucracy and minimizing data redundancy. Thus, this To-Be model offers substantial improvements in service speed, revenue recording accuracy, and financial data validity, supporting more informed managerial decision-making.

Figure 7 illustrates the proposed business process flow (To-Be) for the inpatient revenue receipt system. In this design, the system integrates medical action data and drug usage in the treatment room directly with the financial billing module.

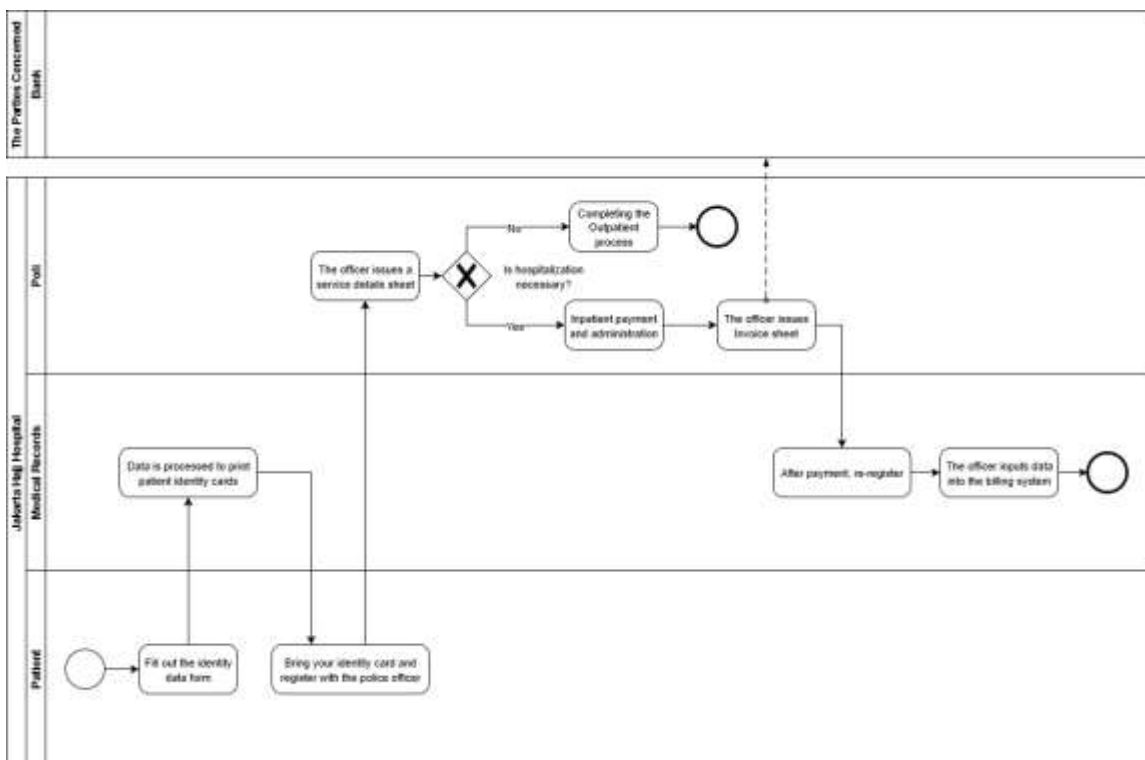


Figure 7. Diagram To-Be of the Inpatient Revenue Receipt System

With this mechanism, the finance department can more accurately monitor payment due dates and the status of tenant receivables, ensuring that cash inflows from non-medical sectors are recorded orderly and transparently in the hospital's books, as seen in Figure 8.

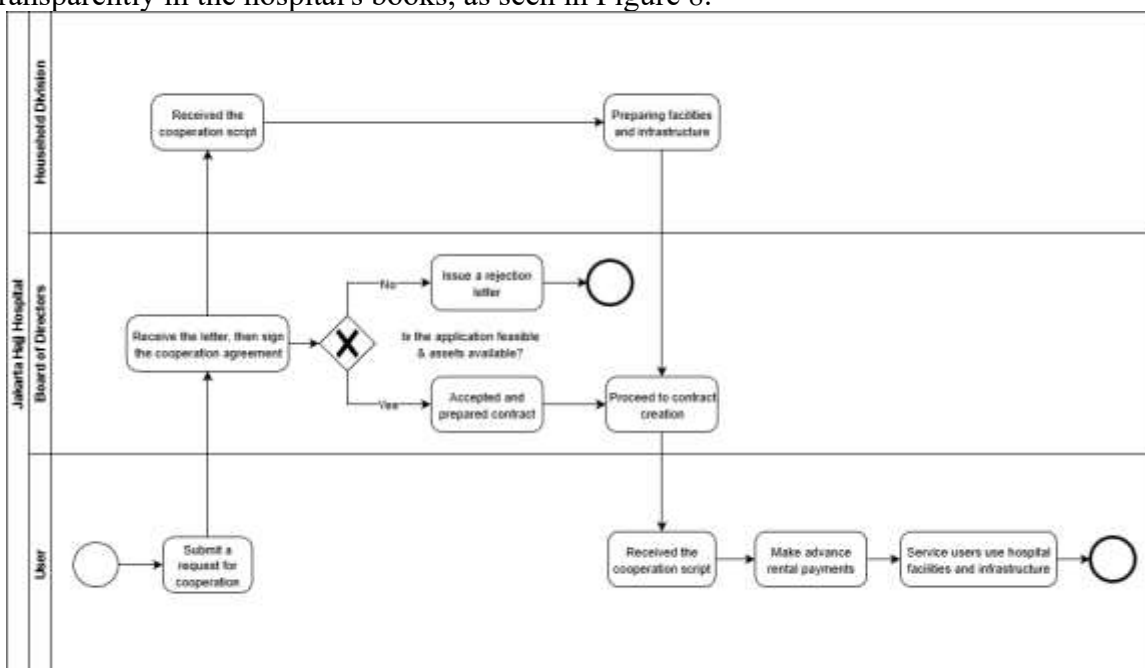


Figure 8. Diagram To-Be of the Non-Operational Income Receipt System for Facility Rental

Figure 9 then visualizes the proposed procedures related to handling patient administration with insurance (ASKES, LKS, BBM) and revenue reduction management. The main focus of this flow is the implementation of system integration (bridging) that connects the hospital application with the insurer's system to expedite eligibility verification and claims submission.

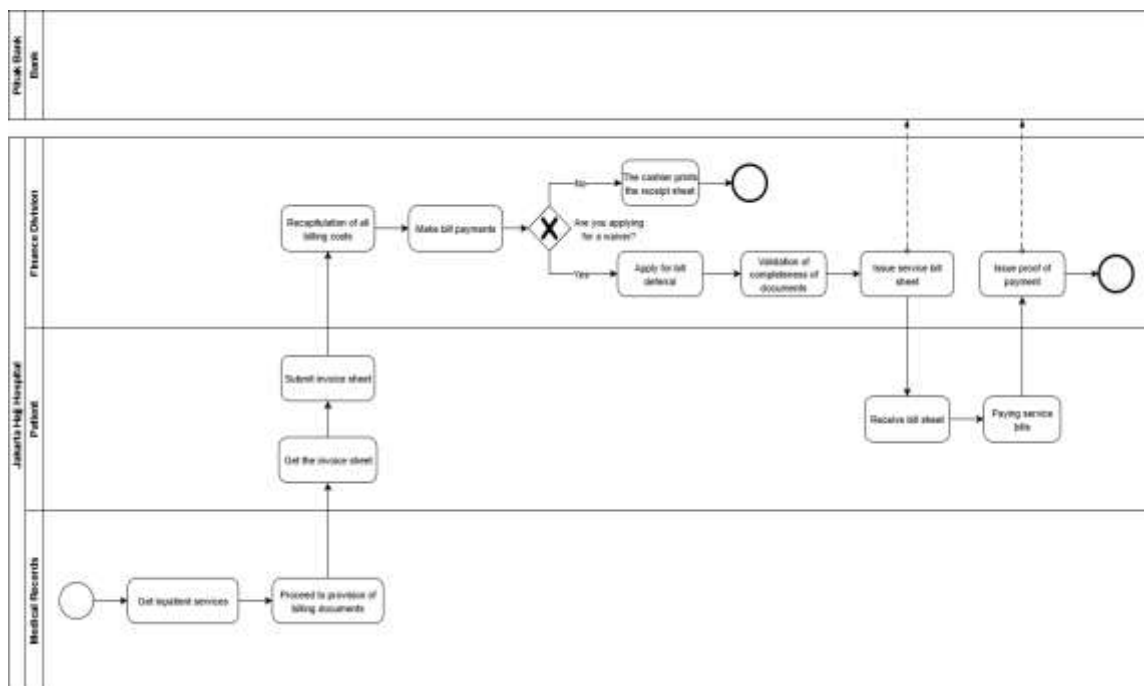


Figure 9. Diagram To-Be of the ASKES, LKS, BBM, and Revenue Reduction Receipt System Information System Architecture

The design focus is divided into two main domains: Data Architecture and Application Architecture, which aim to build an integrated digital foundation for the Jakarta Hajj Hospital. In the Data Architecture, a centralized database model is designed that standardizes clinical and financial information entities to ensure data integrity, consistency, and eliminate redundancy inherent in the legacy system. Meanwhile, the Application Architecture maps the design of an interconnected software portfolio, including integration between Hospital Management Information System (SIMRS) modules, the billing system, and interfaces (bridging) with external systems such as BPJS and banking. The synergy between these two architectures is designed to facilitate real-time and automated information flow, thereby supporting business process efficiency and accurate financial reporting.

Data Architecture

Data architecture aims to identify, classify, and design a management structure for hospital data assets to ensure information integrity. Based on the current situation analysis, it was discovered that data is often duplicated (redundant) between units.

Application Architecture

Application architecture aims to design a blueprint for the application portfolio or software modules needed to manage data and support business processes. At this stage, the system's functional requirements are defined so that the financial system is no longer a stand-alone system but can be easily connected to medical operations.

CONCLUSIONS

Based on the overall design stages using The Open Group Architecture Framework (TOGAF), this study concludes that the transformation of the financial system at Haji Hospital Jakarta is an urgent strategic step to overcome inefficiencies caused by manual processes and data fragmentation. Through an in-depth analysis of the conditions (As-Is) and mapping of strategic needs, the resulting architectural design (To-Be) is able to offer a comprehensive integration solution, where medical service data, medical records, and financial administration are now connected in a centralized database ecosystem. The implementation of this architectural blueprint is theoretically proven to be able to eliminate data input redundancy, accelerate the BPJS claim verification process through a bridging

mechanism, and provide real-time financial data visibility, so that hospital management has an accurate and transparent basis for strategic and operational decision-making.

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