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Enterprise Architecture Planning for ICU Nursing Information Systems: Integrating Trauma Assessment and SBAR into Service and Data Landscapes

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Abstract
Healthcare information systems in Intensive Care Units (ICUs) are often developed by digitizing clinical documentation without sufficiently modeling the relationships among business services, data, and application components within an enterprise architecture. In addition, existing enterprise architecture studies in healthcare are frequently derived from organization-specific workflows, which may limit their adaptability across different healthcare institutions. This study develops a service landscape for ICU nursing information systems using the Enterprise Architecture Planning (EAP) approach and the TOGAF Architecture Development Method (ADM) up to Phase C. A qualitative case study was conducted through observation, interviews, shadowing, document analysis, and comparative analysis of enterprise architecture studies in healthcare. Business services were abstracted from comparable ICU nursing workflows, while Trauma Assessment and SBAR were used to identify information requirements and formulate the conceptual data structure. The proposed architecture comprises Business Architecture, Data Architecture, Application Architecture, and an Application Landscape that establishes traceability among business services, data entities, and application modules. The architecture was validated using the TOGAF Architecture Capability Maturity Model (ACMM), resulting in an average score of 4.03, which corresponds to Level 4 – Managed. This result indicates that the proposed blueprint is well structured, traceable, and suitable as a reference for developing ICU nursing information systems. The findings suggest that integrating business service abstraction, clinical assessment standards, and comparative enterprise architecture analysis can produce a more conceptual and adaptable architecture than approaches based solely on a single organizational case.

INTRODUCTION

Digital transformation in the healthcare sector has encouraged hospitals to develop information systems capable of supporting services effectively, efficiently, and sustainably. Information systems are no longer viewed merely as tools for digitizing documents but as strategic components that integrate business processes, data, applications, and technology to support decision-making and improve healthcare quality. Along with the increasing complexity of healthcare organizations, information system development requires architectural planning that ensures alignment between business needs and technology implementation so that systems can be developed in a structured, integrated, and sustainable manner (Akula et al., 2025; Mampilly et al., 2026; Jason et al., 2025).

One of the healthcare service units with a high level of complexity is the Intensive Care Unit (ICU). The ICU manages critically ill patients who require continuous monitoring, accurate clinical documentation, and rapid coordination among healthcare professionals. Changes in patient conditions must be promptly identified, documented, and communicated to ensure continuity of care (Hellzén et al., 2022; Khatri et al., 2023). This situation highlights the importance of information systems capable of managing clinical information in an integrated manner. However, in practice, information system development in hospital environments is still frequently implemented partially, focusing primarily on form digitization or specific application development. Consequently, the relationships among service processes, clinical data, and application functions are not always represented within a comprehensive architectural framework (Noteboom et al., 2025; Haghighathoseini et al., 2018; Mohd Rahimi et al., 2023).

Enterprise Architecture (EA) is a widely adopted approach for aligning business processes, data, applications, and technology through a structured blueprint for information system development. Through Enterprise Architecture, organizations can document existing conditions (as-is architecture), design desired future conditions (to-be architecture), and systematically formulate system development strategies. One important artifact within Enterprise Architecture is the Service Landscape, which provides a conceptual representation of the relationships among business services, actors, data entities, and applications that support organizational processes. The Service Landscape offers a comprehensive view of how services generate, utilize, and distribute information, thereby serving as a foundation for gradual and consistent information system development (Girsang & Abimanyu, 2021; Bernard, 2012; El-Sheikh et al., 2016).

Previous studies have demonstrated that Enterprise Architecture can improve alignment between organizational requirements and information technology implementation in the healthcare sector. This approach has been applied in the development of hospital information systems, healthcare referral systems, and healthcare interoperability frameworks. However, most existing studies remain focused on developing Enterprise Architecture at the organizational level or designing specific applications. Research that specifically models the Service Landscape at the service-unit level, particularly within the Intensive Care Unit (ICU), remains limited. Furthermore, the integration of business services, data structures, and application functions within nursing care processes has not been widely represented as part of a comprehensive Enterprise Architecture blueprint (Jonnagaddala et al., 2020; Maris et al., 2023; Handayani et al., 2019).

Meanwhile, studies on Trauma Assessment and Situation, Background, Assessment, Recommendation (SBAR) have primarily focused on their effectiveness as standards for critical patient assessment and clinical communication to improve patient safety. Limited research has explored the use of information generated from these approaches as a foundation for identifying information requirements and developing data structures within Enterprise Architecture. In practice, information generated during assessment, monitoring, documentation, and handover processes is directly associated with business services performed in ICU nursing care. This condition indicates a research gap in integrating clinical knowledge with the Enterprise Architecture approach, particularly in service modeling and information structure development (Thim et al., 2012).

Based on observations conducted at the Intensive Care Unit (ICU) of Oto Iskandar Hospital in Nata Soreang, the clinical documentation process still utilized several separate documents, including Trauma Assessment forms, SBAR communication forms, and other supporting records. Although services were conducted according to applicable operational standards, the relationships among services, data, applications, and involved actors had not been represented in an architectural blueprint. Consequently, information system development had the potential to occur in a fragmented manner due to the absence of a conceptual model describing the relationships among system components.

To address these challenges, this study employed the Enterprise Architecture Planning (EAP) approach as a business-driven framework and implemented it using The Open Group Architecture Framework Architecture Development Method (TOGAF ADM) up to Phase C (Information Systems Architecture). This approach was selected because it provides systematic development of Enterprise Architecture artifacts, beginning with organizational requirement identification and continuing through the development of Business Architecture, Data Architecture, and Application Architecture. Thus, the relationship between business processes and information systems can be represented consistently (The Open Group, 2022).

Unlike previous studies that generally modeled Enterprise Architecture based on organizational-level business processes, this study developed a Service Landscape through abstraction of ICU core services supported by comparative analysis of previous Enterprise Architecture studies in the hospital domain. In this approach, Trauma Assessment and SBAR were not positioned as business services but were used as references for identifying information requirements and constructing data entity structures. The research output consisted of a Service Landscape representing relationships among business services, data entities, modules, and applications, producing a conceptual service design that can be adapted by ICU service organizations with similar characteristics through adjustments to clinical data structures and communication standards.

Based on this background, this study aimed to design a Service Landscape for an ICU nursing care information system using the Enterprise Architecture Planning (EAP) approach with the implementation of TOGAF ADM up to Phase C. The research outputs included Business Architecture, Data Architecture, Application Architecture, and a Service Landscape blueprint representing relationships among business services, data, and applications as a conceptual foundation for developing more structured, adaptive, and organization-aligned ICU nursing care information systems.

METHOD

This study employed a qualitative case study approach conducted in the Intensive Care Unit (ICU) of Oto Iskandar Hospital in Nata Soreang. The qualitative approach was selected because the research focused on identifying organizational needs, analyzing business processes, and designing an information system architecture based on actual conditions within the ICU service environment. The case study design enabled an in-depth exploration of service processes, information structures, and information system requirements within a specialized healthcare unit.

The research object was the ICU nursing care process, including patient admission, monitoring, assessment, handover communication, and patient transfer services. The research

was conducted at the Intensive Care Unit of Oto Iskandar Hospital in Nata Soreang through observation, interviews, document collection, requirements analysis, and the development of a Service Landscape blueprint. Data were collected using four techniques: observation, interviews, documentation studies, and shadowing. Observations were conducted to identify service processes and workflow patterns in ICU nursing care.

The Enterprise Architecture design was developed using the Enterprise Architecture Planning (EAP) approach and implemented based on The Open Group Architecture Framework Architecture Development Method (TOGAF ADM). The EAP approach was selected because it provides a business-driven framework that connects business processes with data and application requirements systematically. The TOGAF ADM framework was used as a guideline for developing Enterprise Architecture artifacts, from identifying organizational requirements to designing information systems architecture (Bernard, 2012; The Open Group, 2022).

This research was limited to the architecture development stages related to Information Systems Architecture, consisting of the Preliminary Phase, Phase A (Architecture Vision), Phase B (Business Architecture), Phase C (Data Architecture), and Phase C (Application Architecture) of TOGAF ADM. The limitation was applied because the study focused on designing the Service Landscape for an ICU nursing care information system and did not include subsequent stages related to implementation, migration planning, or architecture change management.

RESULTS AND DISCUSSION

Requirement Analysis and Architecture Vision

Requirement Analysis and Architecture Vision are the initial stages in TOGAF ADM which aims to define the architectural needs and scope of system development. In this study, this stage is used to translate the needs of ICU nursing care services into architectural needs that are in line with organizational goals and become the basis for the preparation of Business Architecture. The results of the analysis produced four groups of architectural needs consisting of Business Requirement, Information Requirement, Data Requirement, and Application Requirement. These four groups of needs are a reference in identifying business services, data needs, and application modules in the next phases of TOGAF ADM.

Table 1. Requirement Analysis

Requirement	Description
Business Requirement	Integration of ICU nursing primary care services.
Information Requirement	Complete, consistent, and easily accessible patient information.
Data Requirement	Data structures that support patient admission, monitoring, assessment, handover, and transfer.
Application Requirement	Application modules that support all major ICU services in an integrated manner.

Based on Table 1, the main needs of organizations focus on integrating service processes, centralizing information management, and providing applications that are able to support ICU nursing care documentation. The results of this identification resulted in a business driver that shows that organizational needs are not only limited to application development, but require a

comprehensive architecture design so that every business component, data, and application is consistently interconnected. Business drivers are then translated into business goals that are targeted by architectural development. This business purpose is a reference in the preparation of business services in the Business Architecture phase as shown in the following Table.

Table 2. Business Goal

Business Goal
ICU service information integration
Centralized nursing care documentation
Support for Trauma Assessment
SBAR-based handover communication support
Efficiency of service information management
Provision of information for clinical decision-making

Based on the organizational needs, driving factors, and business objectives that have been identified, Architecture Vision was formulated as the direction of the development of the Service Landscape of the ICU Nursing Care Information System which is able to integrate business services, data, and applications in one architectural design. This vision is the foundation for the business service identification process in the Business Architecture phase so that all the artifacts produced remain oriented to the needs of the organization.

Business Architecture

The Business Architecture stage aims to define the business service structure to support ICU nursing care services as the basis for the preparation of the Service Landscape. Business Architecture development is carried out through analysis of existing business processes (AS-IS), design of proposed business processes (TO-BE), identification of business services, and preparation of Business Service Landscapes. In addition, a comparative analysis of several studies on ICU nursing workflow was conducted to ensure that the resulting business services represent the core activities of ICU services and do not depend on the implementation of a specific organization.

Existing Business Process (AS-IS)

Based on the results of observation, shadowing, and document studies, the ICU nursing care service process consists of the main activities as shown in Table 2.

Table 3. Existing Business Process

Yes	Existing Business Process
1	Patients are admitted to the ICU through the admission process and handover from the home unit.
2	Nurses record admission data as initial service information.
3	Nurses monitor the patient's condition periodically.
4	The monitoring results were documented on the patient's observation sheet.
5	Nurses conduct Trauma Assessment using the ABCDE method.
6	The results of the assessment are used as the basis for evaluating the patient's condition and nursing actions.
7	The nurse compiles patient development information for the handover process.
8	Handover is carried out using the SBAR communication method at shift changes.
9	The medical team evaluates the patient's condition.

Yes	Existing Business Process
10	The patient remains hospitalized in the ICU or is prepared for the transfer process according to the results of the evaluation.
11	Nurses document the patient's transfer process.
12	The handover of patients was carried out to the destination unit and ICU services were declared complete.

Based on the business process, it is known that each activity produces information that is interrelated, but still documented in various media such as admission forms, monitoring sheets, Trauma Assessment forms, SBAR forms, and electronic medical records. This condition causes service information to be not integrated so that the process of searching for information and communication between health workers still requires access to several documents.

Proposed Business Process (TO-BE)

Based on the results of the analysis of existing business processes, a proposed business process (TO-BE) was designed that integrates all service activities into the ICU Nursing Care Information System. In the proposal process, admission, monitoring, assessment, handover, and transfer data are recorded and managed in one information system so that all service information can be used continuously by each subsequent business process. The integration is expected to reduce duplication of records, improve information consistency, and support continuity of patient services.

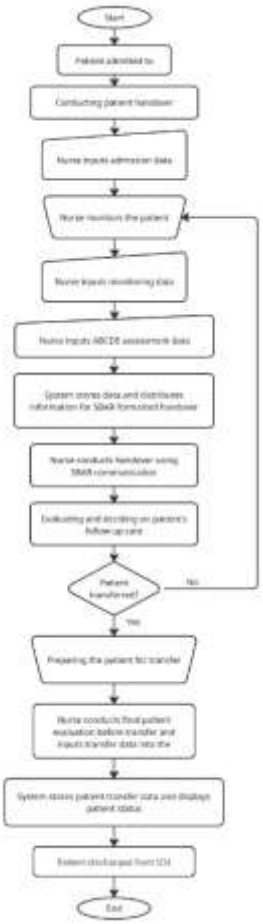

Figure 1. Proposed Business Process (TO-BE)

Business Service Landscape

Based on the results of the business process analysis, five main services were obtained consisting of Admission Service, Monitoring Service, Assessment Service, Handover Service, and Transfer Service. The five services were then compared with several Enterprise Architecture studies in the hospital environment to identify the suitability and differences in the scope of services. The comparison results show that most of the previous research still modeled services based on the implementation in each organization, while this study grouped services based on the core business functions of ICU services, resulting in a more general service structure. Then the analysis showed that all studies had relatively consistent main activities, namely patient admission, patient monitoring, clinical assessment, clinical handover, and patient transfer. The difference lies in the assessment method, clinical communication method, and the form of documentation used.

Table 4. Comparative Analysis of Business Processes

Yes	Research	Research Focus	Identified ICU Activity	Implications for the Service Landscape
1	Delayed Admission to the Intensive Care Unit and Mortality of Critically Ill Adults. (Kiekkas et al., 2022)	Analyze the ICU admission process and its impact on critical patient mortality.	ICU Admission, patient assessment, decision making, transfer to ICU.	Showing that Admission is the main service that always appears before the patient receives intensive care.
2	The Interhospital Medical Intensive Care Unit Transfer Instrument Facilitates Early Implementation of Critical Therapies. (Malpass et al., 2015)	Develop patient transfer instruments between hospitals to ICUs.	Patient transfer, handover information, patient stabilization, documentation.	Reinforcing that Transfer Service and Handover Service are interrelated activities in the continuity of ICU services.
3	Nursing Assessment in Intensive Care Unit: A Systematic Review. (Sukartini & Wahyuni, 2025)	Identify the stages of nursing assessment based on ICU service standards.	Pre-arrival assessment, Quick Assessment, Comprehensive Assessment, Ongoing Assessment, Monitoring.	It shows that Monitoring and Assessment are core activities of ICU services that are carried out continuously.
4	The Design and Application of an Intensive Care Unit Point-of-Care Nursing Handover Checklist Based on the SBAR Technique. (Wang et al., 2022)	Development of SBAR-based handover checklists.	Assessment, SBAR communication, Nursing handover, Recommendation.	It shows that SBAR functions as a communication mechanism in the handover process so that it is more appropriate to be used as a basis for the preparation of information structures than as a business service.

Based on the analysis of previous research, it was found that ICU service activities have a relatively consistent pattern even though each study focuses on different aspects, such as patient admission, patient monitoring, clinical assessment, clinical handover, and patient transfer. The similarity of these activities is the basis for the abstraction process to compile a

generic Business Service Landscape. The abstract results are then modeled into the Business Service Landscape as shown in Figure 3.

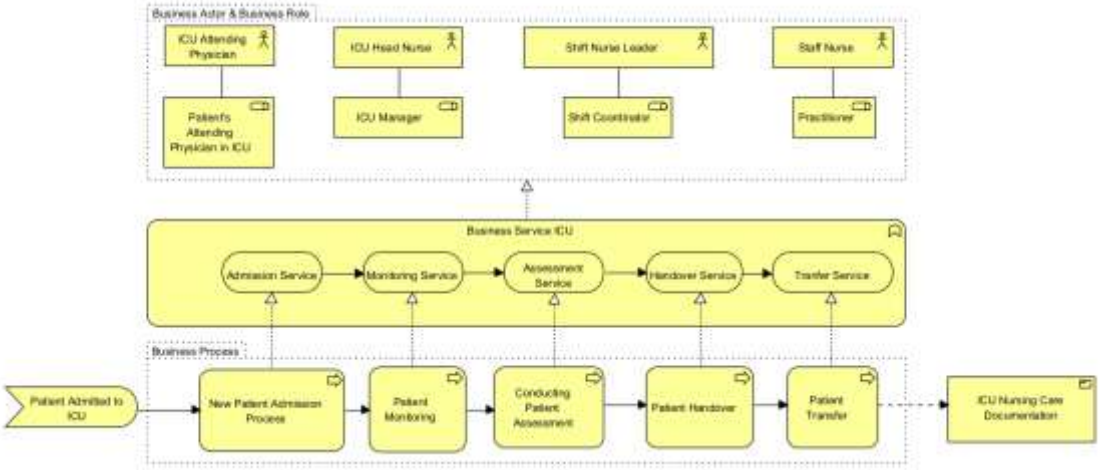

Figure 2. Business Service Landscape

The Business Service Landscape in Figure 3 shows the results of the abstraction of the ICU service business process into five business services, namely Admission, Monitoring, Assessment, Handover, and Transfer Service. The abstraction process is supported through a comparative analysis of previous research so that the resulting services represent the core business function of ICU services, not the operational implementation of one organization. These results are the basis for the preparation of Data Architecture and Application Architecture in the next stage.

Data Architecture

The Data Architecture phase aims to identify the data needs needed to support each business service that has been generated in the Business Architecture phase. In this study, identification was carried out based on the information needs of each business service so as to produce a data structure that supports the ICU nursing care service process.

Identify Data Needs

The identification of data needs is carried out based on the results of Business Architecture by referring to ICU service documents, Trauma Assessment forms, and SBAR communication. Although sourced from research case studies, the resulting data needs represent business services that have been abstracted so that they become the basis for the preparation of data structures in the Data Architecture phase.

Table 5. Identification of Data Needs

Source of Identification	Description
Business Service	Data needs are derived from five main business services, namely Admission, Monitoring, Assessment, Handover, and Transfer Service.
ICU Service Documents	Admission form, patient monitoring form, patient transfer document, and nursing care documentation.
Trauma Assessment	It is used as the basis for identifying the Assessment data structure through the Airway, Breathing, Circulation, Disability, and Exposure (ABCDE) components.

Source of Identification	Description
SBAR	It is used as the basis for identifying the handover data structure through the Situation, Background, Assessment, and Recommendation components.
Stakeholder ICU	Validation of data needs is carried out with DPJP, Head of Room, and ICU Nurse to ensure compatibility with the service process.

Data Dissemination Diagram

The results of the identification of data needs are then modeled into a Data Dissemination Diagram to illustrate the distribution of data from the input process to being utilized by the service modules. This diagram shows the relationships between key data and how information is distributed across each functional service in the ICU Nursing Care Information System.

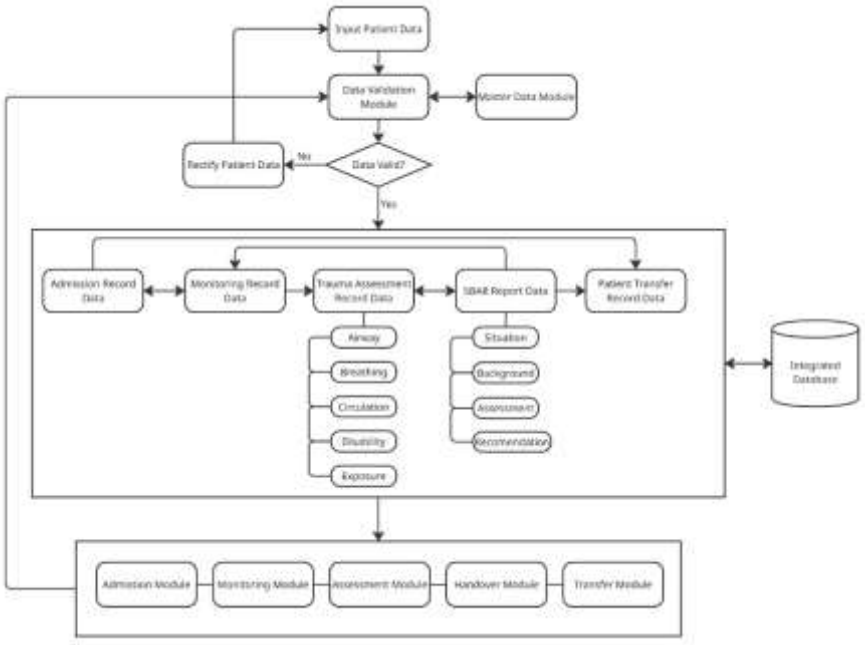

Figure 3. Data Dissemination Diagram

Based on Figure 6, the data distribution process begins with patient data input and validation before being distributed to monitoring data, Trauma Assessment data, SBAR data, report data, and log audit data. In this study, the Trauma Assessment data structure was compiled based on the ABCDE component, while the SBAR data referred to the Situation, Background, Assessment, and Recommendation components. All of this data is then used by the admission, monitoring, assessment, handover, and transfer modules to support the integration of information in the ICU service process.

Data Architecture Diagram

Based on the results of the identification of data needs and information distribution modeling in the Data Dissemination Diagram, a Data Architecture Diagram was then prepared to represent the conceptual relationship between business services, data entities, and information systems that support the ICU service process. This modeling aims to ensure that each business service has an appropriate data entity so that the information needs of each service can be managed consistently.

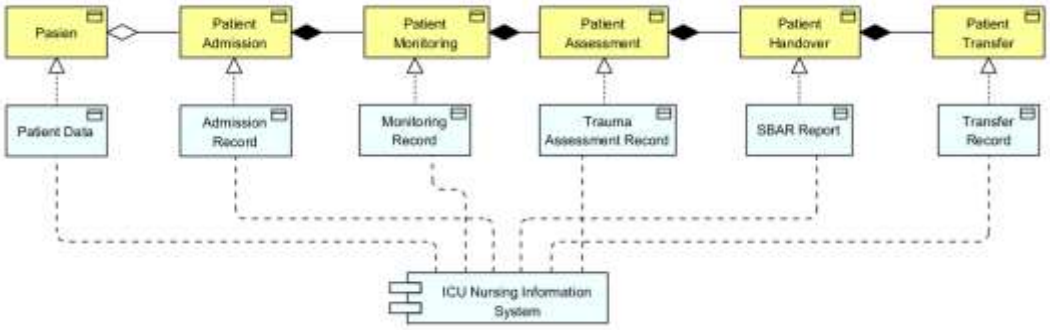

Figure 4. Data Architecture Diagram

Figure 5 shows the relationship between business services, data entities, and the ICU Nursing Information System as an application that manages all service data. Each business service generates a data entity that represents the key information on each service. The data structure is formed based on the information needs that have been identified in the previous stage so as to provide a conceptual basis for the preparation of the Application Architecture. Trauma Assessment and SBAR data are formed based on clinical information needs so that changes in assessment methods or communication in other organizations only affect the data attributes without changing the structure of business services.

Application Architecture

The Application Architecture stage aims to realize the results of Business Architecture and Data Architecture into an application structure that supports each business service. The design is carried out by identifying application modules and the relationships between modules so that business service needs and data needs can be implemented in an integrated manner. The resulting application architecture is conceptual so that it can be used as a reference in the development of the ICU Nursing Care Information System.

Application Architecture Input

Application architecture design is carried out based on the results of Business Architecture and Data Architecture that have been obtained in the previous stage. Application module identification takes into account business process needs, data needs, and established architectural principles so that each module is able to support the services being implemented.

Table 6. Application Architecture Inputs

Source	Description
Business Service	The five main business services are Admission, Monitoring, Assessment, Handover, and Transfer Service.
Data Architecture	The data structure consists of patient data, monitoring, trauma assessment, SBAR, reports, and transfers.
Architectural Principles	Service integration, ease of data access, modularity, and consistency of information.
Stakeholder Needs	Functional needs obtained from observation, interviews, and analysis of the ICU service process.

Application Architecture

The results of the application needs are then modeled into the Application Architecture to describe the application structure that supports the implementation of each business service. This diagram shows the relationship between the main service module, the supporting module, and the external module in supporting the ICU service process.

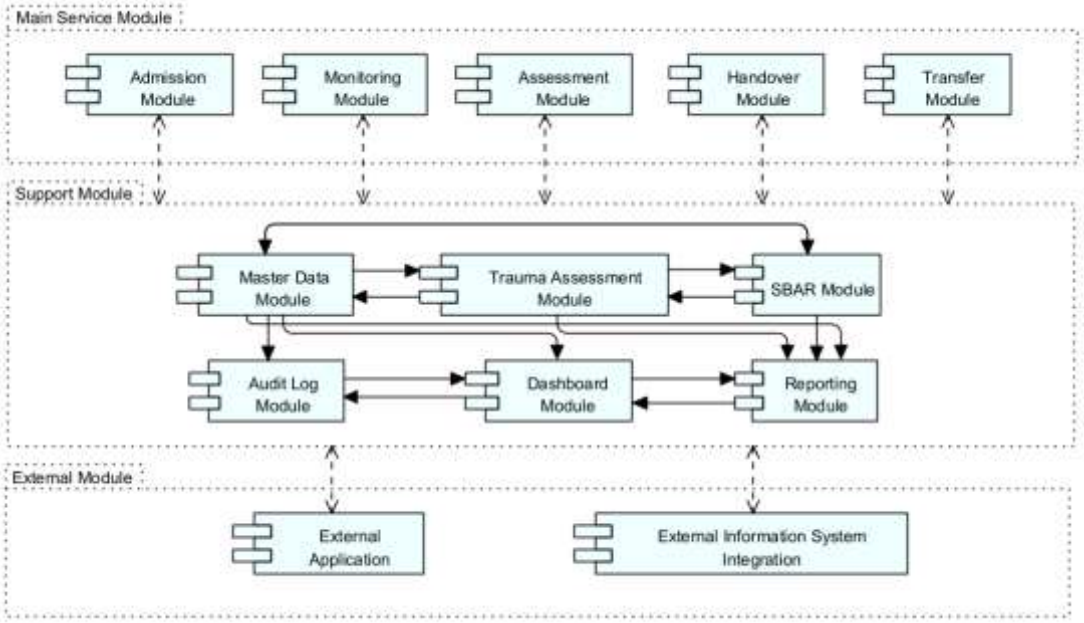

Figure 5. Application Architecture Diagram

Figure 6 shows the application structure consisting of the Main Service Module, Support Module, and External Module. The Main Service Module realizes the five main business services that have been identified in the Business Architecture phase, while the Support Module provides supporting functions that are used jointly in data management, reporting, and service evaluation. In addition, the External Module is provided as an interface to support interoperability when the system is developed with external applications.

The grouping of such modules shows the separation between functions that directly realize business services and functions that provide shared services. This approach supports the principles of loose coupling and reusability in the design of application architectures thereby increasing the flexibility of system development.

The separation of the main service module and the supporting module applies the principle of modularity so that each application function has clear responsibilities and can be developed gradually without affecting the rest of the services. Thus, the resulting application structure not only realizes the business and data needs that have been identified in the previous phases, but also provides the basis for a more integrated system implementation as part of the Service Landscape.

Service Landscape

The Service Landscape is the result of the integration of Business Architecture, Data Architecture, and Application Architecture that has been compiled in the previous stage. This blueprint shows the interconnectedness between architectural artifacts so that each business

service is supported by the needs of data and appropriate application modules. The integration ensures that the architectural design has consistency between layers and can be used as a reference in the development of the ICU Nursing Care Information System.

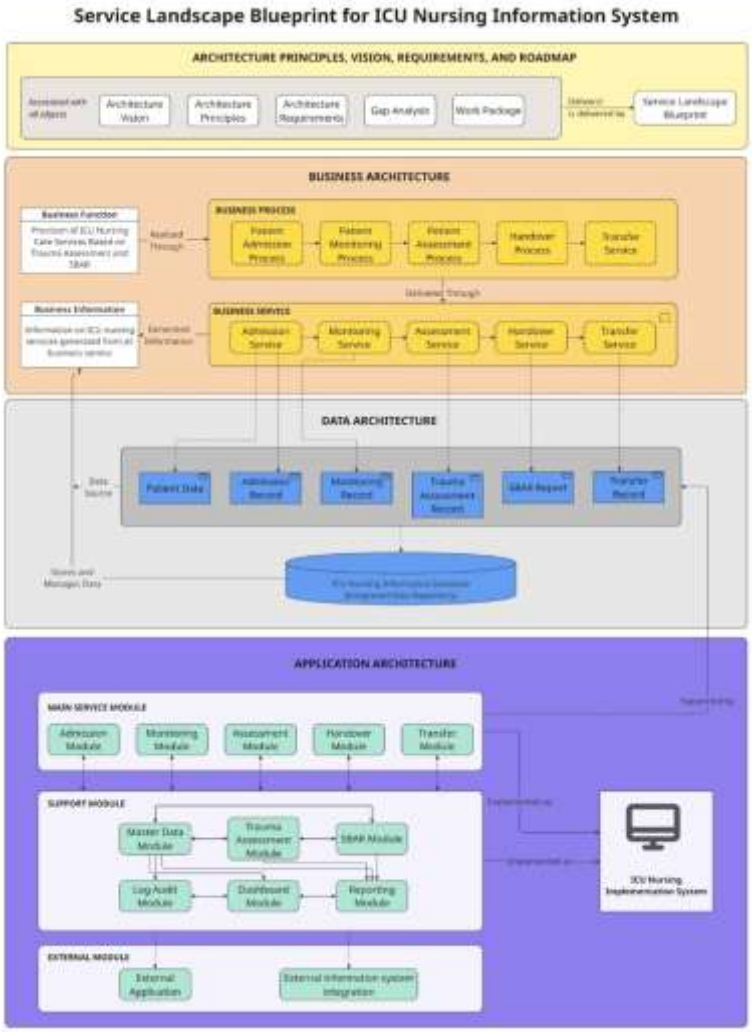

Figure 6. Service Landscape Blueprint

The Service Landscape in this study is not formed directly from the business process of case studies, but through the process of abstraction of core business functions supported by the comparative analysis of several Enterprise Architecture studies in the hospital domain. This approach results in a more conceptual service structure so that it can be a reference in the development of architecture in ICU service organizations with similar service characteristics.

Figure 7 shows that the relationship between business services, data structures, and application modules is built gradually following the stages of TOGAF ADM. Business services generated through the abstraction process become the basis for identifying data needs, then realized into an integrated application structure. The interconnectedness between these artifacts forms a Service Landscape that provides traceability from business needs to application implementation.

Thus, the resulting Blueprint addresses the discrepancies between business processes, data, and applications that have not been previously modeled in a single, unified architecture design. With the existence of the Service Landscape, the relationship between services, data needs, and applications can be traced consistently so as to provide a conceptual reference in the development of the ICU Nursing Care Information System.

Testing and Validity

Validation was carried out to evaluate the suitability of the Service Landscape design to the needs of ICU nursing care services and assess its feasibility as a reference in the development of information systems. The validation process refers to the TOGAF Architecture Capability Maturity Model (ACMM) which is used to measure the maturity level of the blueprint based on the aspects of Business Architecture, Data Architecture, Application Architecture, and Service Landscape. The assessment is carried out by stakeholders who understand the ICU service process so that the evaluation results reflect the suitability of the design with the needs of the organization.

Calculation of Validation Values

The validation score was obtained by calculating the average score of each indicator based on the assessment of all validators, then calculated the overall average to determine the maturity level of the blueprint using the TOGAF ACMM classification.

Table 7. Validation Value Calculation Formula

Calculation	Formula	Remarks
Average indicators	$\bar{X}_i = \frac{\sum_{j=1}^{n} X_{ij}}{n}$	X_{ij}= Scores of 4 validators on the 1st indicator; Calculate the average of each indicator.i
Overall average	$\bar{X} = \frac{\sum_{i=1}^{m} \bar{X}_i}{m}$	$\bar{X}_i$= Average of the to-; Calculate the average of all indicators (20 indicators).i

The average values obtained are then mapped into the TOGAF Architecture Capability Maturity Model (ACMM) classification to determine the maturity level of the architectural blueprint.

TOGAF Maturity Level Classification

To interpret the results of the blueprint assessment, the overall average value is mapped into the TOGAF Architecture Capability Maturity Model (ACMM) classification as shown in Table 8. The classification is used to determine the level of blueprint maturity based on the average value obtained from the validation results.

Table 8. TOGAF Maturity Level Classification

Average Score	Level Maturity	Description
0,00 – 0,99	Level 0 – None	Blueprints do not yet meet the basic principles of Enterprise Architecture.
1,00 – 1,99	Level 1 – Initial	Blueprints are still in their early stages and require a lot of refinement.
2,00 – 2,99	Level 2 – Under Development	Blueprints have been formed but are not yet fully integrated.
3,00 – 3,99	Level 3 – Defined	The blueprint has been well documented and in accordance with architectural needs.

Average Score	Level Maturity	Description
4,00 – 4,99	Level 4 – Managed	Blueprint has been integrated and deserves to be used as a reference for system development.
5,00	Level 5 – Optimized	Blueprint has fulfilled all architectural principles optimally.

Validation and Interpretation Results

Based on the results of the assessment of 20 indicators by 10 validators, an overall average score of 4.03 was obtained, as presented in Table 9.

Table 9. Recapitulation of Blueprint Validation Results

Architectural Aspects	ACMM TOGAF Basics	Assessment Focus	Number of Indicators	Total Score
Business Architecture	Process Architecture and Business Linkage	The suitability of business actors, business roles, business services, relationships between services, and the relationship of services to business goals.	5	4,32
Data Architecture	Content Architecture and Data Management	Suitability of data structures, relationships between entities, data integration, and Trauma Assessment and SBAR data modeling.	5	4,26
Application Architecture	Application Architecture, Architecture Capability, and Architecture Communication	Application module suitability, integration between modules, ease of understanding blueprint, and readiness for application implementation.	5	3,68
Service Landscape	Architecture Integration, Architecture Governance, and Architecture Capability	Consistency of integration between architectural layers, traceability, suitability to organizational needs, and feasibility of blueprints as a reference for system development.	5	3,88
		Total	**20**	**4,03**

Based on the TOGAF ACMM classification, the average score of 4.03 is at Level 4 (Managed). This level of maturity shows that the Service Landscape blueprint has been structured, meets the needs of ICU services, and has consistency between Business Architecture, Data Architecture, and Application Architecture. Thus, the blueprint is considered suitable for use as a reference in the development of the ICU Nursing Care Information System.

CONCLUSION

This study demonstrated that the Enterprise Architecture Planning (EAP) approach combined with TOGAF ADM was able to produce a Service Landscape representing the core services of an ICU nursing care information system. Through the abstraction of business processes and comparative analysis of previous studies, five main business services were identified and consistently translated into Data Architecture and Application Architecture, resulting in an architectural blueprint with traceability across architecture layers. Validation using the TOGAF Architecture Capability Maturity Model (ACMM) obtained an average score of 4.03, corresponding to Level 4 (Managed), indicating that the proposed blueprint adequately addressed ICU service requirements and was suitable as a reference for information system development.

This research contributed to the development of a Service Landscape constructed through the abstraction of business services, allowing the blueprint to extend beyond the operational context of a single organization. This approach enables the blueprint to serve as a conceptual reference for developing ICU information systems with similar service characteristics. Future research may extend this design toward the Technology Architecture phase or system implementation and conduct validation across multiple hospitals to evaluate the adoption and applicability of the blueprint in diverse healthcare service environments.

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