ENTERPRISE ARCHITECTURE FOR ENHANCING SELF-SERVICE OFFERINGS IN DIGITAL CHANNELS WITHIN THE TELECOMMUNICATION INDUSTRY

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Abstract - This research aims to analyse the influence of Enterprise Architecture (EA) on Digital Self-care Services (DSS) at PT Wahana Sukses Makmur. The background of this research is based on the company's need to improve the efficiency of digital services through better system integration. However, there are still gaps in the optimal implementation of EA to effectively support DSS. Therefore, this study examines the extent to which EA contributes to improving the quality of the company's digital services. This research uses a quantitative method with a simple linear regression approach. The population in this study were customers of PT Wahana Sukses Makmur, with a sample size of 100 respondents selected through appropriate sampling techniques. Data was collected through a questionnaire that measured customer perceptions of EA implementation and DSS quality. The results showed that EA has a significant influence on DSS, with an F test value of 104.070 and a significance level of 0.000 ($p < 0.05$). In addition, the t-test results show a regression coefficient of 0.875, which indicates that each one-unit increase in EA implementation will increase the quality of DSS by 0.875 units. Theoretically, this study confirms the important role of EA in supporting DSS development through improved system integration and optimisation of digital processes. The practical implications of this research suggest PT Wahana Sukses Makmur adopt a more structured enterprise architecture to improve operational efficiency, accelerate digital services, and create a more responsive and user-friendly customer experience.

Keywords - Enterprise Architecture, Digital Self-care Services, Digital Services, Operational Efficiency, Customer Satisfaction.

I. INTRODUCTION

In the era of rapidly evolving digital transformation, the telecommunications industry faces great challenges in providing responsive and efficient services for customers. Changes in consumer behaviour that are increasingly dependent on digital technology require telecommunications companies to provide services that are faster, independent, and easily accessible. One widely adopted solution is digital self-care services, which allow customers to manage accounts, purchase packages, or resolve issues without having to contact customer service directly. However, the implementation of these services often faces various obstacles, such as unoptimized system integration, inefficient business process flow, and limited resources in information technology management[1]. Enterprise Architecture (EA) is a strategic approach that can be used to align information technology infrastructure with business needs, so as to optimize digital self-care services. EA serves as a framework that provides a comprehensive overview of the company's information technology structure, helping to identify areas that need improvement or further development. With careful planning, EA can improve the efficiency of business processes, optimize system integration, and ensure that the digital services provided are able to effectively meet customer needs. Previous studies have shown that implementing EA in the telecommunications industry can improve the quality of digital services and provide a better user experience. Prasetyo et al. (2022) found that the application of EA in self-care-based digital services can increase customer satisfaction by providing faster access and a more integrated system [1].

PT Wahana Sukses Makmur faces various challenges in providing effective digital self-care services for its customers. One of the main issues is the suboptimal integration of information systems, where fragmented systems make it difficult for customers to access services independently, such as checking bills, applying for technical assistance, or changing account data. As a result, customers still have to contact customer service manually, which reduces the efficiency of digital self-care services. In addition, the complexity of poorly documented business processes is another obstacle. The disorganization in the workflow makes it difficult for the company to respond quickly to customer needs, as internal staff need more time to find information or make decisions. Lack of documentation also hinders coordination between divisions in effectively managing and developing digital services.

On the other hand, limited human resources in the field of information technology also contribute to hindering the optimal development and maintenance of digital services. The company lacks experienced experts in managing digital service systems, so the repair process when a disruption occurs is slower, innovation in developing service features is limited, and integration with the latest technology is difficult. With these problems, the digital self-care services provided have not been able to provide an optimal customer experience. If not addressed immediately, this condition has the potential to cause a decrease in customer satisfaction and risks reducing customer loyalty in the long run. Based on the background that has been described, this study seeks to determine how the implementation of Enterprise Architecture affects the effectiveness of digital self-care services at PT Wahana Sukses Makmur. Therefore, this study aims to analyze the extent to which the implementation of Enterprise Architecture can increase the effectiveness of digital self-care services at the company.

This research uses a quantitative approach with a survey method to measure the extent to which the implementation of EAs affects the effectiveness of digital self-care services. Data is collected through a questionnaire which will be statistically analyzed to obtain objective findings. This research, it is hoped to it can provide deeper insights for PT Wahana Sukses Makmur regarding the implementation of EA in increasing the effectiveness of digital self-care services.

II. SIGNIFICANCE OF THE STUDY

This research has both theoretical and practical significance. Academically, this research contributes to the development of Enterprise Architecture theory by highlighting how its implementation can improve the efficiency of Digital Selfcare Services. The findings in this study can also enrich the literature related to digital architecture optimization strategies in supporting business transformation. Practically, the results of this study provide insights for PT Wahana Sukses Makmur in improving operational efficiency and service quality of Digital self-care services, which in turn can increase customer satisfaction and company competitiveness. In addition, this research is useful for company management in designing more effective digital system management strategies, for customers in getting more responsive and quality services, and for academics as a reference in studies related to technological innovation in the digital service sector.

A. *Literature Review*

1. *Enterprise Architecture*

According to Ali et al. (2021), enterprise architecture is a framework used to define and organize the core components of an enterprise, encompassing business processes, information systems, and the technologies that support them [2]. Liliana and Andry (2024) define enterprise architecture as the practice employed to design, analyze, implement, and manage the architecture of enterprise

systems to enhance business effectiveness and efficiency[3]. Based on these definitions, it can be concluded that enterprise architecture is a strategic approach aimed at aligning business processes, information technology, data, and applications within an organization to improve efficiency, effectiveness, and flexibility in adapting to changes.

There are several indicators of Enterprise Architecture, which are as follows Herlina et al (2022):

a. Business-IT Alignment
   Business-IT alignment within enterprise architecture refers to the extent to which IT strategies support business objectives, ensuring that technology investments are synchronized with operational needs and long-term vision to enhance corporate efficiency and competitiveness.
b. IT Consolidation
   IT consolidation highlights the role of enterprise architecture in unifying and optimizing information technology resources by minimizing system duplication, streamlining infrastructure, and maximizing IT assets. The structured implementation of EA improves operational efficiency, reduces maintenance costs, and ensures that technology optimally supports business objectives.
c. Flexibility and Adaptability
   Flexibility and adaptability in enterprise architecture enable organizations to adjust to business and technological changes, respond swiftly to market dynamics, and leverage innovations to enhance operational efficiency.
d. IT Cost Effectiveness
   IT cost effectiveness reflects the role of enterprise architecture in managing technology costs efficiently through system standardization, infrastructure consolidation, and resource optimization. Structured EA implementation reduces redundancy, improves operational efficiency, and facilitates more optimal allocation of IT budgets.
e. Business Process Improvement
   The implementation of an enterprise architecture integrated with information systems enhances business process efficiency, reduces redundancy, and strengthens inter-departmental coordination. Furthermore, a more structured system enables faster and more accurate responses to customers, with effectiveness measurable through improvements in efficiency and service quality.

2. *Digital Selfcare Services*

According to WHO (2023), digital self-care services are technology-based service systems that enable customers to access, manage, and resolve their service needs independently, without requiring direct interaction with customer service representatives [5]. Ali et al. (2021) define digital self-care services as a form of customer service automation that utilizes digital platforms, such as mobile applications or web portals, to allow customers to perform various transactions, including bill checking, additional service purchases, and account management[2]. Based on these definitions, it can be concluded that digital self-care services are technology-based services that enable customers to independently access, manage, and resolve their needs through digital platforms, without having to interact directly with customer service representatives.

Digital self-care services encompass several key indicators, as outlined below[6]:

a. User Satisfaction
   This refers to the level of customer satisfaction with the digital services provided. If customers find the services they access easy to use, fast, and able to resolve their issues, then the satisfaction level will increase.
b. Service Effectiveness
   This measures the extent to which digital services can provide appropriate solutions to customers without requiring direct interaction with customer service agents. Effectiveness

includes the accuracy of information, system response speed, and the customer's success in resolving issues independently.

c. Ease of Access
This indicates the degree to which customers can easily access digital services, whether through mobile applications, web portals, or other technologies. Factors include an intuitive user interface, 24/7 service availability, and compatibility with various devices.

d. Customer Engagement
This describes the level of customer interaction and participation in using digital services. The more frequently customers use the features of digital services, the higher their engagement. This is also related to customer loyalty and their tendency to continue using the services provided by the company.

B. Previous Research

TABLE I
PREVIOUS RESEARCH

Author's Name	Research Title	Research Method	Research Findings
Fajri Tsani Yustisiawandana and Rizal Fathoni Aji (2024) [7]	Design of Enterprise Architecture to Enhance Local Government's SPBE Index: A Case Study of Tasikmalaya Regency	Action research method with a qualitative approach	This research produced an Enterprise Architecture (EA) design that aligns with the national SPBE architecture and the needs of the Tasikmalaya Regency Local Government, utilizing the TOGAF ADM framework. This design encompasses business process simplification, data architecture modifications, application solutions, technology reinforcement, and enhanced system security. The implementation is structured based on the 2025-2029 RPJMD and has been validated by experts and stakeholders.
Mira Indriyulia Ekarini, Agus Rahayu, Disman and Lili Adi Wibowo (2024) [8]	Implementation of Digital Transformation and Government Enterprise Architecture in Improving the Performance of Integrated Social Services	The research methodology employed an explanatory survey approach, involving 27 social service providers in the West Java Province using a full population sample	The research findings indicate that environmental turbulence, flexibility strategies, business model innovation, and digital transformation significantly influence social service performance when mediated by enterprise architecture orientation.

C. Research Data

1. Respondent Data

This study involved 100 respondents who are customers of PT Wahana Sukses Makmur and have utilized digital self-care services. Respondents were selected based on several criteria, including age, gender, service usage frequency, and subscription duration. Of the total respondents, 60% are active users who access self-care services more than five times per week, while the remaining 40% use the service occasionally or rarely. Additionally, the distribution of subscription duration indicates that 45% of respondents have been subscribers for more than three years, while 55% are new customers with a subscription duration of less than three years.

2. Customer Satisfaction Level Data

Customer satisfaction with self-care services was measured using a Likert scale ranging from 1 to 5, where 1 indicates "very dissatisfied" and 5 indicates "very satisfied." Among the 100 respondents, 72% expressed satisfaction with the ease of use of the digital services, while 28% felt that there were still aspects that needed improvement, particularly in terms of service response speed and the accessibility of certain features. The average customer satisfaction score ranged from 3.6 to 3.8, indicating that although the service has met the needs of most customers, there is still room for improvement to enhance overall user satisfaction.

C. Research Location

This research was conducted at PT Wahana Sukses Makmur, located at WTC Mangga Dua 1st Floor, Block B, Jalan Gunung Sahari No. 1, RT 1/RW 5, Ancol, Pademangan District, North Jakarta, Special Capital Region of Jakarta 14430.

D. Research Methodology

1. Research Approach

This study utilizes a quantitative approach to analyze the relationships among predefined variables using numerical data. The quantitative research method focuses on investigating particular populations or samples through structured data collection techniques, employing research instruments, statistical analysis, and hypothesis testing to ensure objective results [9]. In the context of this study, the quantitative method is applied to analyze the effectiveness of Enterprise Architecture in enhancing the quality of digital self-care services at PT Wahana Sukses Makmur.

2. Population and Sample

The population is a generalized area comprising objects or subjects with specific characteristics and qualities defined by the researcher as the focus of the study, from which conclusions are drawn [10]. The target population in this study includes all customers of PT Wahana Sukses Makmur who have utilized digital self-care services. The sample, selected based on specific characteristics, serves as a representative subset of the overall population [10]. This study employs a sample of 100 respondents, selected using purposive sampling, a method of sample selection based on predefined criteria. The criteria for the respondents in this study are as follows:

a. Customers who have used digital self-care services for at least three months.
b. Customers who have experience in accessing the company's digital service features.
c. Employees of PT Wahana Sukses Makmur are involved in the operation of digital self-care services.

3. Data Collection Techniques

Data collection techniques refer to the systematic methods employed by researchers to gather relevant information or data required for a study [10]. The data for this research were obtained from two primary sources:

a. Primary Data
   Primary data refers to information obtained firsthand by the researcher directly from the original source to address specific research questions [11]. This research collected primary data through questionnaires utilizing a five-point Likert scale to assess customer satisfaction with digital services and employees perceptions of Enterprise Architecture (EA) effectiveness.
b. Secondary Data
   Secondary data are data that have been collected by other parties and are available for reuse in research [11]. In this study, secondary data were obtained from internal reports of PT Wahana Sukses Makmur regarding service performance before and after EA implementation, such as system response time, the number of customer complaints, and transaction success rates.

4. Data Analysis Techniques

Data analysis techniques are the processes of processing, interpreting, and drawing conclusions from data that have been collected in a study[10]. Data analysis aims to identify patterns, relationships, or trends that can support the research hypotheses or objectives [11]. This study employs simple linear regression for data analysis, complemented by hypothesis testing using the t-test (partial) to assess the impact of independent variables on the dependent variable.

a. Simple Linear Regression Test
   A simple linear regression analysis is conducted to examine the relationship between a single independent variable and a single dependent variable [9]. This research employs a simple linear regression analysis to assess the correlation between Enterprise Architecture implementation (X) and customer satisfaction (Y). This simple linear regression model is expected to explain how changes in the implementation of Enterprise Architecture contribute to increased customer satisfaction.
b. t-Test (Partial)
   The t-test is employed to assess whether each independent variable exerts a statistically significant influence on the dependent variable when analyzed individually [9]. This study employs a t-test to examine whether the implementation of Enterprise Architecture has a significant impact on the quality of digital self-care services, specifically in relation to customer satisfaction and the operational efficiency of the company.

III. RESULTS AND DISCUSSION

A. Descriptive Analysis of Respondents

1. Respondent Gender

The table below provides a descriptive analysis of respondents categorized by gender.

TABLE III
RESPONDENT GENDER

Gender	Number	Percentage
Male	39	39,0%
Female	61	61,0%
Total	100	100%

From Table II, it can be seen that the majority of respondents in this study were female, as many as 61 people or 61.0% of the total respondents. Meanwhile, the number of male respondents was 39 people or 39.0%. This difference in proportion shows that the participation of women in this study is higher than that of men. This composition can affect the results of the study, especially if the variables studied have relevance to gender characteristics.

2. Respondent Age

The following table presents the descriptive analysis of respondents based on their age:

TABLE IIIII
RESPONDENT AGE

Age Group	Number	Percentage
Under 20	12	12,0%
21 - 30	71	71,0%
31 - 40	15	15,0%
41 - 50	2	2,0%
Total	100	100%

Based on Table III, the dominant age group in this study is 21-30 years old, which includes 71 respondents or 71.0% of the total participants. This shows that the majority of respondents are from the young to early adult age group, who are generally in the higher education or early career stage. The next age group is 31-40 years old with 15 respondents (15.0%), which likely consists of individuals who have had more experience in the world of work. Meanwhile, there are 12 respondents (12.0%) who are under 20 years old, and may still be in the secondary education or early college stage. The 41-50 age group had the least number of respondents, with only 2 people (2.0%), indicating lower engagement from more mature age groups. The dominance of the 21-30 age group may have implications for the research results, especially if the topic under study is related to habits, preferences or behavioural patterns that are more common at that age. In addition, the low number of respondents from older age groups may limit the generalizability of the results to the wider population.

B. Data Analysis

1. Simple Linear Regression Test

The following table presents the results of the simple linear regression test conducted using IBM SPSS 25:

TABLE IVV
SIMPLE LINEAR REGRESSION TEST RESULTS

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	337,745	1	337,745	104,070	,000[b]
	Residual	318,045	98	3,245		
	Total	655,790	99			

a. Dependent Variable: Digital Selfcare Services
b. Predictors: (Constant), Enterprise Architecture

Based on the table above, the F-statistic value is 104.070 with a significance value of 0.000 which is smaller than the significance level of 0.05, indicating that Enterprise Architecture has a significant influence on Digital Self-care Services at PT Wahana Sukses Makmur. These results confirm that Enterprise Architecture plays an important role in improving the efficiency and effectiveness of digital self-care services offered by the company. With a better architecture system, PT Wahana Sukses Makmur can integrate various digital services more optimally, accelerate response time to customer needs, and improve overall service quality. In addition, the implementation of a stronger Enterprise Architecture allows the company to be more adaptive to technological developments so that the digital services provided can always follow market trends and user needs. Therefore, companies need to continue to develop and optimize this system in order to increase competitiveness and provide a better customer experience.

2. T-Test (Partial)

The following presents the results of the t-test (partial) conducted using IBM SPSS 25*:*

TABLE V
T-TEST RESULTS (PARTIAL)

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-3,868	1,799		-2,150	,034
	Enterprise Architecture	,875	,086	,718	10,201	,000

a. Dependent Variable: Digital Selfcare Services

The t-test results show that the Enterprise Architecture variable has a significant influence on Digital Self-care Services at PT Wahana Sukses Makmur. The regression coefficient value of 0.875 indicates that each one-unit increase in Enterprise Architecture implementation will increase the quality of digital self-care services by 0.875 units, assuming other variables remain constant.

The t-count value of 10.201 which far exceeds the t-table value and the significance value of 0.000 which is smaller than 0.05 reinforces the conclusion that this effect is significant. This means that better implementation of Enterprise Architecture not only contributes theoretically but also has a real impact in improving the reliability and effectiveness of digital services at PT Wahana Sukses Makmur. In practical terms, these results indicate that the better the Enterprise Architecture system implemented, the higher the operational efficiency achieved by the company. This can impact the reduction of customer waiting times in accessing digital services, enhance data security, and provide a more comfortable and interactive user experience. Furthermore, with a more structured architectural system, companies can reduce the potential for technical disruptions, increase flexibility in adapting services to customer needs, and accelerate innovation in the development of digital service features

C. Research Findings

The results of this study show that EA has a significant relationship with Digital Self-care Services (DSS) at PT Wahana Sukses Makmur. Using simple linear regression analysis, this study tested the relationship between the two variables. The regression test yielded an F-statistic value of 104.070 with a significance level of 0.000, which is below the 0.05 threshold, thus indicating a significant relationship between EA and DSS. These results indicate that the regression model used in this study is quite capable of explaining the relationship between EA and DSS, although it cannot be concluded as a causal relationship.

The partial t-test results show a regression coefficient of 0.875, which means that each one-unit increase in Enterprise Architecture (EA) implementation correlates with an increase of 0.875 units in Digital Self-Care Services (DSS). The t-statistic value of 10.201, which exceeds the critical value of the t-table, as well as the significance level of 0.000 (below 0.05), indicate that EA has a significant relationship with improving DSS quality. However, it is important to note that these results only show a correlational relationship, not a causal relationship, so there is still the possibility of other variables that have an effect but were not examined in this study.

This finding is in line with research conducted by Smith and Watson (2021), which states that effective EA implementation can increase the efficiency of digital services through optimal system integration [12]. In addition, research by Johnson et al. (2022) also showed that companies that implemented EA thoroughly experienced significant improvements in digital service quality and customer experience [13]. Anderson and Lee (2023) further explained that EA contributes to operational efficiency, particularly in the context of customer service digitization [14]. With a

robust EA system, companies can automate service processes, reduce operational costs, and increase flexibility in adopting the latest technological innovations.

However, this study has several limitations that need to be considered. First, this study only uses data from one company, PT Wahana Sukses Makmur, so generalization of the results to the telecommunications industry as a whole is limited. Secondly, this study did not consider other variables that might influence DSS, such as organizational factors, company policies, or the level of digital technology adoption by customers. Therefore, future research is recommended to expand the sample coverage and consider other variables that can provide a more comprehensive understanding.

In addition, the results of a survey conducted at PT Wahana Sukses Makmur showed an increase in customer satisfaction after the implementation of EA, reflecting the effectiveness of the system architecture in improving the accessibility and quality of digital services. However, when compared to previous studies, there are still gaps in measuring the impact of EA on specific aspects of customer experience, such as service speed and ease of navigation of digital systems. Therefore, further research is needed to explore these aspects in greater depth to emphasize the novelty of the research in the context of the telecommunications industry.

Practically, this study provides important implications for PT Wahana Sukses Makmur in managing its digital system. The company should prioritize the implementation of a more structured and integrated EA to build an information technology infrastructure that is more flexible and adaptive to evolving business needs. A well-managed EA can improve operational efficiency, accelerate digital service processes, and provide a better customer experience through faster, more responsive and user-friendly service access. In addition, effective EA implementation can also reduce inefficiencies in information system management, especially related to data redundancy, system compatibility, and information security. A well-organized system can minimize the risk of technical errors, reduce system downtime, and improve the overall quality of digital services. EA also enables more optimized business process automation, so that resources can be allocated more efficiently in the development of new service innovations.

With increasing competition in the digital industry, companies that are able to effectively manage and optimize their Enterprise Architecture systems will have an advantage in delivering stable, secure, and customer-oriented services. Therefore, investment in the development of a mature and sustainable EA should be a key strategy for PT Wahana Sukses Makmur to enhance its competitiveness in the telecommunications industry.

IV. CONCLUSION

Based on the research findings, it can be concluded that EA has a significant impact on DSS at PT Wahana Sukses Makmur. The results of the simple linear regression analysis indicate that better EA implementation contributes to an improved quality of digital self-care services, particularly in terms of operational efficiency, system integration, and user experience optimization. Specifically, the regression coefficient of [insert coefficient value] with an F-statistic value of (insert F-statistic value) indicates that EA plays a significant role in enhancing DSS effectiveness. This research confirms that EA is not merely a framework for managing IT infrastructure, but also has a strategic role in developing responsive and competitive digital services. With structured and integrated EA implementation, companies can reduce system redundancy, enhance data security, and accelerate customer service processes.

However, this study has several limitations. Firstly, the limited sample scope of only one company may affect the generalization of the findings. Secondly, the analysis method used is solely based on simple regression, thus not considering the possibility of other variables that could moderate or mediate the relationship between EA and DSS. Therefore, further research is recommended to expand the study scope by considering other factors that may influence DSS effectiveness, such as the role of artificial intelligence (AI), Big Data adoption, or customer satisfaction as mediating variables. Additionally, a broader research approach, such as mixed-method design or longitudinal analysis, could provide deeper insights into the long-term impact of EA implementation on digital services across various industry sectors.

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