ARCHITECTURAL DESIGN OF BAKUNJANGAN TOURISM APPLICATION IN BANJARMASIN CITY USING ZACHMAN FRAMEWORK

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Abstract: The implementation of Enterprise Architecture (EA) in Banjarmasin city's tourism sector is essential to improve the effectiveness of information provided to tourists accessing electronic-based services. Unfortunately, there are some crucial challenges to the fundamental requirements of EA in the tourism sector. There is still partial implementation, a lack of understanding of the technological advances used in Banjarmasin city tourism promotion, a lack of understanding of the implementation in an application architecture framework design and the technology to be used, not having good documentation in the design of application systems and slow services in tourism promotion. There is no certainty of normative standardization for system development operating procedures. This research aims to design the Zachman Framework (ZF) Application architecture as an Enterprise Architecture Planning (EAP) methodology, to visualize spatial data. This application is designed to assist users in displaying spatial data in the form of interactive maps that can be accessed via the internet. The software development method used is the iterative and incremental method with the Zachman Framework approach to application design. Data was collected through surveys and interviews at the Department of Culture, Youth, Sports and Tourism (DISBUDPORAPAR) of Banjarmasin City, with the current number of tourism data being 55 tourist attractions. This application can later be used to introduce tourist attractions in Banjarmasin City to the wider community, including tourists visiting this city.

Keywords: enterprise architecture (ea), tourism, zachman framework (zf)

Abstrak: Penerapan Enterprise Architecture (EA) disektor pariwisata kota Banjarmasin amatlah penting untuk meningkatkan efektivitas informasi yang diberikan kepada wisatawan yang mengakses layanan berbasis elektronik. Sayangnya, ada beberapa tantangan krusial terhadap persyaratan mendasar EA di sektor pariwisata. Masih ada yang diimplitasikan seara parsial, kurangnya pemahaman dalam kemajuan teknologi yang digunakan pada promosi pariwisata kota Banjarmasin, kurangnya pemahaman akan implimentasi dalam sebuat perancangan kerangka kerja arsitektur aplikasi dan teknologi yang akan digunakan, tidak memiliki dokumentsai yang baik dalam perancangan sistem aplikasi serta pelayanan yang lambat dalam promosi pariwisata. Belum adanya kepastian standarisasi normatif untuk prosedur operasi pengembangan sistem. Penelitian ini bertujuan untuk merancang arsitektur Aplikasi Bakunjangan Zachman Framework (ZF) sebagai metodologi Enterprise Architecture Planning (EAP), untuk memvisualisasikan data spasial. Aplikasi ini dirancang untuk membantu pengguna dalam menampilkan data spasial dalam bentuk peta interaktif yang dapat diakses melalui internet. Metode pengembangan perangkat lunak yang digunakan adalah metode iteratif dan inkremental dengan pendekatan Zachman Framework untuk perancangan aplikasi. Data dikumpulkan melalui survey dan wawancara pada Dinas Kebudayaan, Kepemudaan, Olahraga dan Pariwisata (DISBUDPORAPAR) Kota Banjarmasin, dengan jumlah data pariwisata saat ini yakni 55 tempat wisata. Aplikasi ini nanti dapat digunakan untuk memperkenalkan objek wisata di Kota Banjarmasin kepada masyarakat luas, termasuk wisatawan yang berkunjung ke kota ini.

Kata kunci: enterprise architecture (ea), pariwisata, zachman framework (zf)

INTRODUCTION

The rapid development of information and communication technology has brought major changes in human life. One of these major changes is the ability to access information and data easily and quickly via the internet. If used properly, information technology can provide competitive value [1] for local governments in developing information systems/applications in supporting their business processes.

Banjarmasin City is one of the cities in Indonesia that has considerable tourism potential, such as cultural tourism, culinary tourism, and natural tourism. Good and effective management of tourism potential can provide great benefits to the community, such as improving economic welfare, introducing cultural and natural wealth, and promoting the city as an attractive tourist destination.

Enterprise Architecture (EA) is fast becoming a critical component for any company that intends to address business, data, infrastructure, and information technology needs [2]. Enterprise architecture (EA) is a process for developing both manual and automated systems. When designing a system, many components are involved and interrelated. These components have their own functions in the system to be developed. [3]. These frameworks generally contain different artifacts that describe a company's strategy, processes, organization, data, applications, technology, and so on. The most recognized framework is the Zachman framework [4].

With the Bakunjangan application, managers of tourism potential in Banjarmasin City can easily manage tourism potential data and provide accurate and reliable information about tourism potential in the city.

The naming of this application was inspired by the Banjar tribal language "Bakunjagan" which means walking around. The implementation of information systems that are in accordance with the needs of the organization can only be answered by considering the integration factor in its planning. The real purpose of integration is to reduce the gaps that occur in the system development process. The paradigm is enterprise architecture which is a logical and comprehensive approach to designing and implementing a system of system components simultaneously [5]. In designing a system, it will be more organized when using a framework. Zachman Framework (ZF) is an architectural framework that is widely known and used in the development of modeling systems [6], Zachman framework is also one of the enterprise architecture frameworks that is useful to facilitate the mapping of an information system application so that it is in accordance with the perspective of each element in the institution [7]. He also identified two main approaches to enterprise architecture, which as a methodology is Enterprise Architecture Planning (EAP) and as a process model is the Enterprise Architecture Strategy (EAS) methodology [8]. Limitations of research variables include: Focus on the perspective of planners and owners in accordance with the EAP concept in defining architectures and defining what is needed and planning the definition of the architecture to be implemented. [9].

Unfortunately some crucial

challenges to the fundamental needs of EA in the e-government sector still exist which are lack of alignment [10], lack of understanding of technological advances, slow services [11], lack of understanding of the usefulness of architectural frameworks, lack of certainty of normative standardization for operating procedures [12] and lack of good documentation [13]. The development of a good enterprise architecture landscape can support business processes that provide quality data or information to reduce costs, increase productivity and improve customer service [14]. In designing the Bakunjangan application for managing tourism potential data in Banjarmasin City, collaboration and synergy between various related parties are needed. The Banjarmasin City Department of Culture, Youth, Sports and Tourism (DISBUDPORAPAR), the tourism community, and application developers need to work together to ensure the success of the design and implementation of this upcoming application.

METHODS

In this research, the research methodology used is data collection that refers to the Zachman framework which is sourced from a 1992 article written by John F. Sowa and John Zachman presenting the framework and its expansion which can be seen in Image 1.

Image 1. Zachman Framework for Enterprise Architecture [15]

The application of the Zachman framework in this study includes the enterprise architecture section consisting of 3 (three) columns and 3 (three) rows in the planning stage of an application system shown in Image 2.

Image 2. Zachman Framework Approach for Bakunjangan Application Design

Furthermore, it is outlined in its application to the design of the Bakunjangan Application enterprise architecture in the research flow, each step of which is described in Image 3.
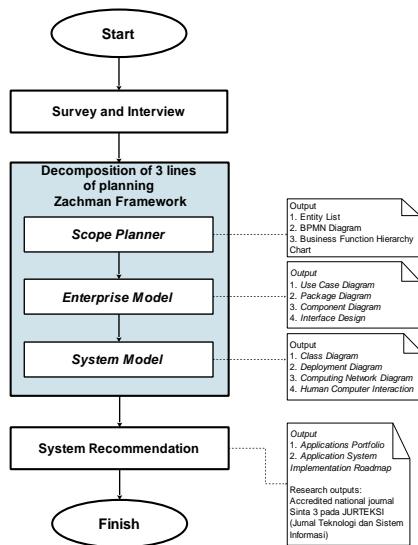
Image 3 Research Flow of Bakunjangan Application Design

The following is an explanation of the first stage in the research to be carried out, where in obtaining information about business processes and business activities that take place routinely in the organization, it is necessary to study and research (survey) on both of these matters. Furthermore, the interview stage is carried out directly with organizational stakeholders, especially those directly related to the management and operation of tourism data management, it is hoped that valid and more accurate information will be obtained.

In the rows and columns of the Zachman matrix that have been filled in, they are then described one by one into a mapping conclusion in accordance with the perspectives that are in the Zachman framework and the expected objectives of the application in the design of the Bakunjangan application.

In the first column What (Data) includes the stages of the first line of the Scope Planner, namely Identifying the scope of the business and the purpose of the benefits application. In addition, in the second line of the Enteprise Model, namely determining the functionality and features of the application and in the third line of the System Model, namely determining the data requirements and data sources needed.

In the second column How (Process) includes the first row of Scope Planner stages, namely choosing the appropriate technology for the bakunjangan application. In the second line of the Enteprise Model, namely identifying the system architecture and data model needed for the next application in the third line of the System Model, namely determining the development tools and programming languages to be used.

In the third column Where (Network) begins with the first line of the Scope Planner, which defines the infrastructure needed for the bakunjangan application. The second line of the Enteprise Model defines the hosting environment, network topology, and security requirements. Continued in the third row of the System Model, namely choosing a database management system (DBMS) that suits your needs..

RESULTS AND DISCUSSION

Survey and interview results from the Tourism Division of DISBUDPORAPAR Banjarmasin City until 2023 where the number of tourism can be seen in Table 1.

Table 1: Number of Tourism Objects by Subdistrict in Banjarmasin City

No	Subdistrict Name	Total Tourism
1	South Banjarmasin	9
2	East Banjarmasin	10
3	West Banjarmasin	5
4	North Banjarmasin	16
5	Central Banjarmasin	15
	Total	55

Entity List

The researcher explained that entities are real objects or abstract concepts that are used as data storage containers. In identifying entities appropriately, it is important to communicate with system owners and users to understand the type of information that needs to be stored and generated. This step aims to categorize the data that will be used in the process of making the Bakunjangan Application. These data entities are collected through interviews and document analysis related to the Bakunjangan Application. The results of the menu and data entity analysis can be seen in Table 2.

Tabel 2. Candidate Menu Application to Data Entity

No	Bakunjangan Application Menu	Data Entity
1	Home	Tourism object entity Sub-district data entity Tourism News entity Application User Entity
2	Tourism List	Tourism Object Entity Tourism Spatial Data Entity
3	Banjarmasin City Subdistrict Data	Sub-district data entity
4	Tourism Map	Tourism Object Entity Tourism Spatial Data Entity
5	Tourism News	Tourism News Entity Comment Entity

Technology Architecture

This phase focuses on the development of technology that will support the application architecture to be developed [16]. The development of technology architecture in the context of the Bakunjangan application has been realized through the application of a detailed Computing Network Diagram.

Using this approach, the technology architecture planning for the Bakunjangan application can be thoroughly examined in the illustration contained in Image 4.
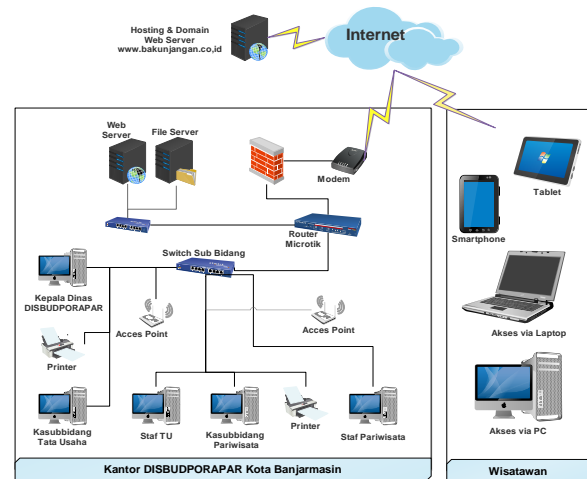

Image 4. Computing Network Diagram of Bakunjangan Application

The deployment diagram maps the software architecture created in design to the physical system architecture that executes it In distributed systems, it models the distribution of the software across the physical nodes [17]. The deployment diagram in the Bakunjangan application design is described in Image 5.
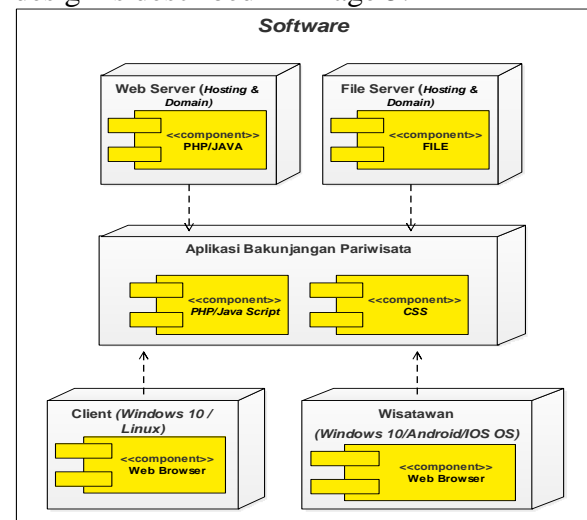

Image 5. Deployment Diagram Software Bakunjangan Application

Interface Design

The interface design of the Bakunjangan application is designed using the principles of responsive, aesthetic, and easy-to-use interface design. This design aims to provide a pleasant user experience and make it easier for users to explore relevant tourism information. The design can be seen in Image 6 and Image 7.
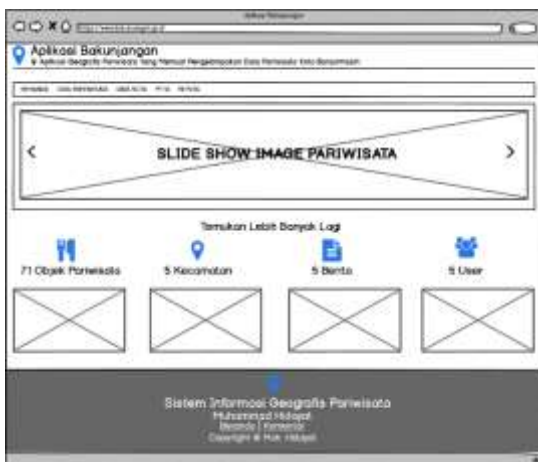

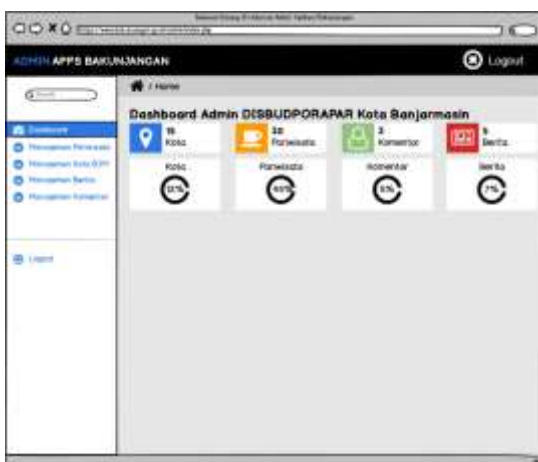Image 6. Design of the Main Page of the Bakunjangan Application WEB

Image 7. Dashboard Design of Bakunjangan Administrator Application

CONCLUSION

In designing the Banjarmasin City Tourism Benefits Application with the Zachman Framework approach, there are several significant results in three main architectural aspects: data architecture, application architecture, and technology architecture.

The data architecture in this application includes 5 data class tables that will be used. These tables are designed to store information related to tourism in Banjarmasin City. Each table represents a different entity, such as the Admin, News, Comments, City Data, and Tourism Data tables. Each table has relevant attributes to store data related to that entity.

In the application architecture, there are 8 candidate application menus designed for tourist access rights. These menus are arranged with the aim of providing an optimal experience for tourist users in exploring tourism in Banjarmasin. In addition, there are also 8 candidate application menus intended for admin access rights.

The technology architecture involves designing a computing network diagram that will be implemented in the application. This diagram illustrates how the technology components in the application will be interconnected and interact with the Bakunjangan Application domain name plan, www.bakunjangan.com

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