

Application of Zachman Framework in Designing Customer Relationship Management at PT Bank Central Asia

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ARTICLE INFO	ABSTRACT
Keywords: Customer relationship management; Zachman Framework Received: 12 Dec 2023 Accepted: 15 Feb 2024 Published: 28 Feb 2024	The implementation of the Zachman Framework in designing a Customer Relationship Management (CRM) system/architecture at Bank Central Asia (BCA), can help BCA in mapping business and technology needs, CRM is intended to map the composition of the organization as a whole and describe it as an interlocking corporate information system. as well as balancing business and IT perspectives in developing an effective and efficient CRM system. Based on the 3x5 matrix of the Zachman Framework, namely What, When, Where, Who, Why, How, it is explained how each perspective can be used in designing CRM systems. By mapping business and technology requirements in a structured manner, BCA can achieve the desired business objectives and improve the quality of service to customers through the implementation of an appropriate CRM system, customer satisfaction and operational efficiency. Therefore, the application of the Zachman Framework can be an appropriate alternative for designing CRM systems at Bank Central Asia.

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1. INTRODUCTION

In today's digital era, banks around the world are increasingly focused on strengthening relationships with their customers. Customer Relationship Management is a strategic approach that helps organizations improve interactions with customers, increase customer satisfaction, and gain a competitive advantage in a competitive market (Chadiq, 2015; Hasan et al., 2023). To implement CRM successfully, it is very important to have a strong foundation and an effective methodology in designing and managing the CRM system. One approach that can be used in designing a CRM system is the Zachman Framework. Zachman. A framework is an enterprise architecture framework used to analyze, plan and design information systems (Safarina et al., 2015). The Zachman Framework was developed by John Zachman in the 1980s and has been widely used in the information technology industry to understand organizational complexity and design effective solutions.

The application of the Zachman Framework in designing CRM at BCA Bank has many benefits. Firstly, this framework helps in understanding the different perspectives of stakeholders regarding CRM. BCA Bank has various parties involved in managing and using CRM, including upper level management, marketing department, customer service, and IT department (Nugraha, 2020). With the Zachman Framework, banks can identify the perspectives of each party and understand different needs and goals. This helps in aligning the overall vision and strategy of the organization. Second, the Zachman Framework helps in understanding the interrelationships between different elements in a CRM system. This framework identifies six distinct dimensions that include what, how, where, who, when, and why. In the context of CRM, this means identifying what data is needed to understand customers, how this

data will be processed and managed, where this data will be stored, who is responsible for managing the data, when the data will be used, and why this data is important for success CRM (Ahmad & Subroto, 2023). Third, the Zachman Framework helps in designing a strong and consistent CRM system structure. By considering the perspectives of various stakeholders, banks can design and implement a CRM system that meets their needs and expectations. It also helps in avoiding errors in design and implementation, reduces project risks, and increases the success of the CRM system. Fourth, the Zachman Framework provides a structured approach to managing the complexity of CRM systems. By breaking down system elements into distinct dimensions, banks can manage each dimension separately, identify dependencies between them, and manage change more efficiently. This is important in a constantly changing business environment, where changes and adaptations of CRM systems are often required.

Applying the Zachman Framework in designing CRM at BCA Bank also has certain challenges. First, understanding and describing the different perspectives of stakeholders can require significant time and effort. Banks need to involve all relevant parties in the design process and ensure a clear understanding of their needs and objectives. Second, designing a CRM system structure that is consistent and appropriate to different perspectives can be complicated. Banks need to use the right framework and allocate sufficient resources to ensure that the CRM system design meets the needs of all stakeholders. In conclusion, the application of the Zachman Framework in designing CRM at BCA Bank provides a structured and comprehensive approach (Wahyuni, 2022). By understanding the different perspectives of stakeholders, managing system complexity, and designing a consistent structure, banks can build effective CRM systems and successfully improve relationships with their customers. Although challenges may arise during the design process, the long-term benefits gained through implementing the Zachman Framework are worth the effort.

Customers play a very important role and are one of the success factors in banking companies. To maintain and also increase customers so they can continue to do business and use the services provided by the bank, bank managers must understand good service quality to provide and improve good customer service (Ayu & Yuliani, 2018). High quality service provides customer satisfaction and is the basis for creating customer loyalty. In addition, premium services also create word of mouth offers and recommendations from existing customers to others so that banks can acquire new customers. Customer loyalty faces the problem of understanding quality for services we need a system that can get more customers and also retain existing customers. The quality of customer service can be improved by using Customer Relations Management (CRM) strategies. Bank Central Asia (BCA) needs a CRM strategy to provide the best service to its clients or customers.

The Zachman Framework was introduced by John A. Zachman in 1987 in the IBM Systems Journal with the goal of providing a structure that supports approaches to the integration, interpretation, development, management, and modification of organizational information systems architecture tools (Ranggadara, 2017). The Zachman framework can help management achieve two main things, namely separating the main components of information systems, namely data, processes and technology, so that design and development can be carried out easily within the organization, and then creating strategic plans within the organization. at the concept level. to the technical implementation. Using the Zachman framework as an approach to creating a CRM system aims to make the system model built more complex and comprehensive.

In an effort to retain customers or acquire new customers, companies need an appropriate strategy. One of the concepts offered is the CRM (Customer Relationship Management) function which is integrated into customer service, the aim of which is to increase customer satisfaction and especially to acquire, maintain and grow business customers. The CRM concept grew at the same time as the company's focus changed from product-centric to customer-centric (Junaedi, 2020). One effort to meet needs that should encourage companies to serve customers better is the implementation of a CRM system, which is an integrated information system used to plan, schedule and control pre- and post-sales

activities. within the organization to increase customer satisfaction. CRM is a dynamic process for managing customer-company relationships so that customers can choose to build mutually beneficial relationships and hope that these relationships do not harm the company.

In the current era of globalization, the development of the banking sector in Indonesia is experiencing rapid progress. As Law no. 10 of 1998 states, banking is a commercial institution that collects money from the public in the form of savings and then distributes it back to the community as loans or in other ways to improve people's living standards. This proves that both parties are trying to improve the quality and conditions of services, products and technology to attract customers. This goal is implemented to fulfill customer satisfaction, because when customer rights are fulfilled, customers use services unconsciously. In Indonesia, the banking sector is currently focused on increasing the availability of services, especially for individual purposes. Because in terms of talent, banking that focuses on individuals can compete better. Therefore, all large banks in Indonesia are always trying to improve services.

To build a planned and customized bank, the bank must be able to create comfort and ease of service for customers. One of them is the provision of automated teller machines (ATMs) in each region to make it easier for customers to carry out payment transactions. The variety of products and services offered by various banks is one sign of banking development in Indonesia. Improve banking services and make it easy for customers to pay for online purchases, online bank checks, or wire transfers without having to travel to complicated locations (Fakriah, et al., 2025; Kurniawan & Jesica, 2024). Over time, the benefits of using banks have changed, from initially the role of banks was to save or borrow money, but now they have become a business tool. This forces Indonesian banks to continue to generate ideas to improve existing products, services and facilities to make it easier and more attractive for customers. Because the better and more diverse the services offered, the more often customers use banking services. This is an added value for customers who can continue to use bank services.

Customers are the most important factor in a bank's success, so banks must provide adequate services to increase the number of customers. Customer loyalty is related to the quality of service offered, and indirectly customers make offers or recommendations to other people. Customer relationship management (CRM) strategies really support banks in attracting and growing customers (Haqqizar et al., 2023). Bank Central Asia (BCA) is a company that serves customers to deposit money or request money for business purposes. In 2017, BCA had 17 million accounts. Supported by up to 1235 BCA branches in Indonesia. It is an integral part of a CRM strategy that facilitates business operations. Apart from making it easier for employees to find customers, CRM strategies are supported by frameworks such as the Zachman Framework which is also a business solution.

The Zachman Framework is a useful framework that helps business planning by organizing data, processes, and technology so that businesses can plan and grow. The aim of the CRM strategy supported by the Zachman Framework is to build a system that meets BCA's needs. The Zachman Framework allows BCA to find important parts by collecting information in the form of data, which is then processed and used to develop the business. The results of data collection are used in strategic planning to increase customer loyalty (Budiraharjo & Nugraha, 2022). The importance of such digital information in the company-client relationship can be overlooked despite the demand for maximum service. One of the most important factors in competing with competitors is improving customer service and implementing the concept of customer relationship management (CRM) (Mubarok & Tjahjadi, 2019). CRM is a business strategy used to pamper customers so they don't switch to competitors. With the introduction of a CRM information system, it is hoped that the quality of customer service will increase. Implementing CRM is not only about retaining existing customers, but also about attracting new potential customers to communicate and collaborate with the company.

2. METHODS

In this research, the literature study research method was used. The literature study research method is one of the research methods commonly used in scientific research. This method involves collecting data from literature sources that are relevant to the research topic, such as books, scientific journals, articles and related documents. The literature study method is usually carried out with the following steps:

Determine the research topic to be studied. Search for and collect literature sources relevant to the research topic. Carry out selection and critical assessment of collected literature sources, taking into account the credibility and relevance of these sources to the research topic. Analyze and interpret data that has been collected, and identify findings or information that is relevant to the research topic. Prepare reports or research results, which include introduction, development and conclusions resulting from literature studies.

3. RESULTS AND DISCUSSION

The Zachman Framework is an enterprise architecture framework used to analyze, plan, and design information systems. This framework identifies six different dimensions, namely what, how, where, who, when, and why. In the context of BCA Bank CRM, applying the Zachman Framework will help in understanding and designing an effective system to improve relationships with customers.

The first dimension, "what", focuses on understanding what data is needed in CRM. BCA Bank must identify relevant data, such as customer personal data, transaction history, customer preferences and previous interactions. In this dimension, it is also necessary to consider regulatory compliance and data privacy.

The second dimension, "how", relates to the understanding of how data will be processed and managed in CRM. This includes data modeling, managing customer interactions, integration with other systems, and data analysis for better customer understanding. In the context of the Zachman Framework, these dimensions help in designing the technical structure and architecture of a CRM system.

The third dimension, "where", addresses the infrastructure and technology aspects of designing a CRM. BCA Bank needs to consider the infrastructure needed, such as databases, servers, networks and relevant software. Security and scalability aspects also need to be considered in this dimension.

The fourth dimension, "who", focuses on the identification and allocation of responsibilities in the management of the CRM system. BCA Bank must determine the stakeholders involved in using and managing CRM, including the marketing department, customer service, upper level management, and the IT department. This helps in ensuring that the goals and needs of all stakeholders are met.

The fifth dimension, "when", involves determining the timing and schedule for CRM system implementation. BCA Bank needs to consider the time required to design, develop and launch the system. Careful planning and effective project management are important in this dimension.

Finally, the sixth dimension, "why", involves understanding the strategic and business objectives behind CRM implementation.

Zachman Framework in designing Customer Relationship Management (CRM) at BCA Bank. This framework has significant benefits in designing effective CRM systems. Let us explain further the results of the discussion:

Understanding Different Perspectives: Zachman Framework helps in understanding different perspectives of stakeholders related to CRM. BCA Bank has various parties involved, including upper management, marketing department, customer service, and IT department. By using the Zachman

Framework, banks can identify the different needs, goals and challenges of each stakeholder. This allows the bank to align its CRM vision and strategy with the interests of all relevant parties.

Identification and Management of Complexity: The Zachman Framework helps in identifying and managing the complexity of CRM systems. By breaking down system elements into six dimensions, banks can manage each dimension separately. BCA Bank can identify the relationship between these dimensions and ensure that changes in one dimension do not damage the relationship with other dimensions. This is important in facing ongoing business and technological changes.

Designing a Consistent System Structure: Zachman Framework helps in designing a consistent and robust CRM system structure. By considering the perspectives of various stakeholders, banks can design a CRM system that meets the needs and expectations of all relevant parties. This framework helps banks avoid design and implementation errors that can hinder CRM success. With a consistent structure, a CRM system can run well, produce efficiency and improve relationships with customers.

CRM Analysis and Design at Bank Central Asia using the Zachman Framework. Based on the data collection that has been carried out, it is followed by mapping the problem into the Zachman framework to get the right CRM design, which is built in the form of a 5x5 matrix using the Zachman framework. The first row describes all important business objects, business processes, and locations. The first line of Zachman's framework is a description of the scope or context of the architecture. Architectures are modeled for complete business models and various business needs. The second line is the owner's opinion, i.e. The system layout is carried out as a data model, after which the system analysis process is carried out first to describe the scope. While the second line describes the current situation, the third line describes the desired system structure. The third row is the data model from the designer's point of view, the system must be able to change future desires from the designer's point of view, and the entrepreneur part is very technical so it can be understood. also from the perspective of its creator. . Information systems model view that describes the logical information model, application architecture, and distributed architecture of a CRM system. The fourth row is the technology model, which refers to the physical data model, or application database design, and system design, or software design. The fifth line is a detailed explanation of the roles and objectives of the party responsible for creating the information system. A detailed description explains the data definitions, programs, and network architecture used in CRM.

The scope statement describes the goals and scope of the company. The first line in Zachman's framework is often referred to as contextual architecture. The business model architecture is defined operationally and various external needs of the company or organization. Define a Zachman framework for business critical data columns These columns describe critical objects that the company controls. Very important data is used to design CRM in Central Asian banks, including customer information, products, SOP services and information about Bank of Central Asia. The processes in the columns of the first two rows are a list of business execution processes which are useful for determining a list of business activities to convert input into output. The process carried out to implement Bank Central Asia's CRM identifies customers who can be categorized as customers based on business and income, of course the customer profile is used as input. Owned by Bank Central Asia. The next process is customer retention or customers who need to maintain good relationships with customers.

This service of course comes from the results of learning bank customer service standards in Central Asia to maximize the services offered to clients and in accordance with the standards set by them. The final process provides information services to employees who serve customers' wants and needs, for this reason there must be information and which carriers of information are needed for employees to obtain a complete customer profile and which are not provided for telephone or banknote use, but appear in the database created for Bank Central Asia.

The next column in the scope description is the geographically related network of the business and how each element exchanges information with others and can warehouse data. The branch office is in Indonesia, so the proposed CRM can be between connected office spaces.

This business model describes a business model that can be seen from the owner's perspective, this model is often called conceptual architecture. A model describes a structured system design, and information and process modeling are used to create a comprehensive descriptive analysis system. Above this column is the Semantic Model label, which explains what we can do from the CRM architecture. Entity Relationship (ER) is a database modeling method used to create a conceptual scheme based on the semantic model of a system. Data models can be described by ER diagrams that depict entities, e.g. products, customers, employees, and similar solutions in Figure 2. Entity relationship between the customer's chosen product object and one customer with one product at Bank Central Asia.

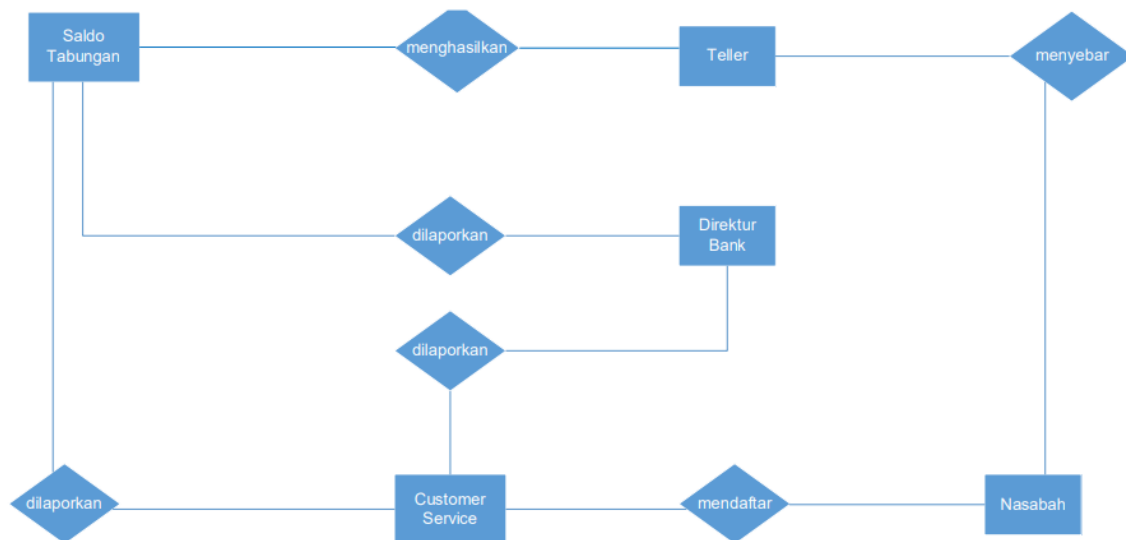


Figure 1. Data Entity Chen Diagram

The business process model contains relationships in the field of information units, and activities are objects of management, production and use for business purposes. This line includes procedures, practices, and standards similar to business model rules. Business rules are created with complex business rules created by effectively managing customer transactions. The business logic system has the necessary functions to create a description of the location of service-related units in Central Asia, contact customers and their locations described in a simple grid format in the form of nodes (business units) and rows (relationships) shown in Figure 2.

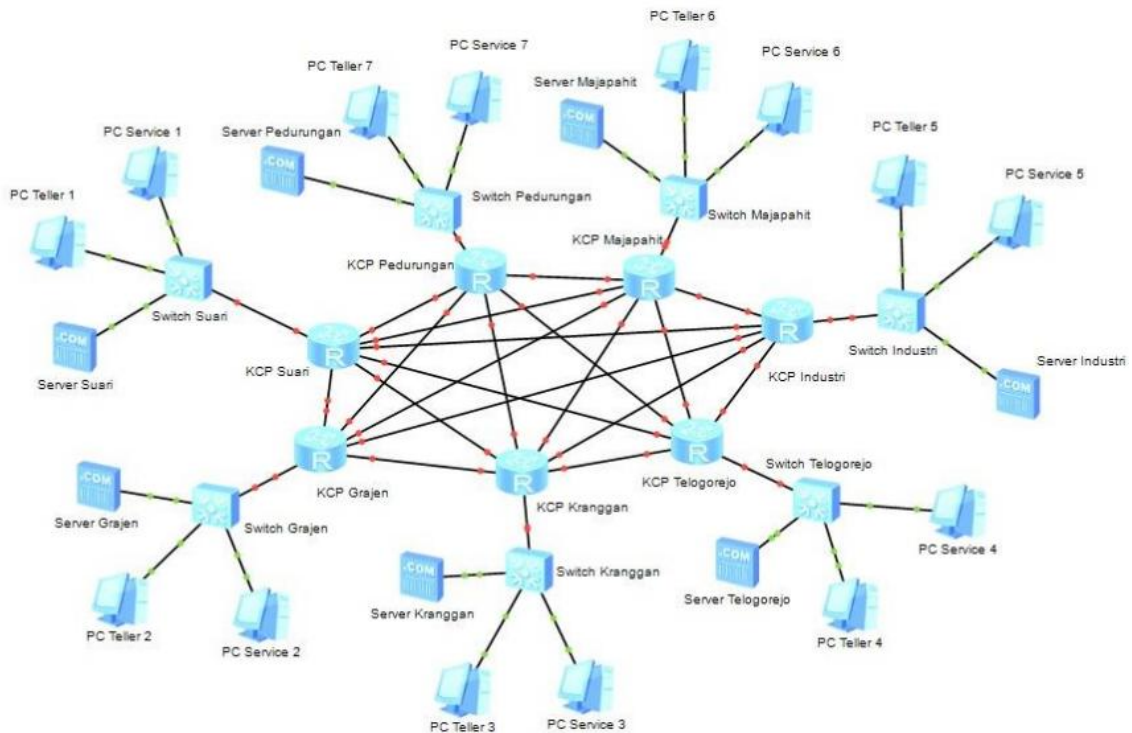


Figure 2. Network Topology

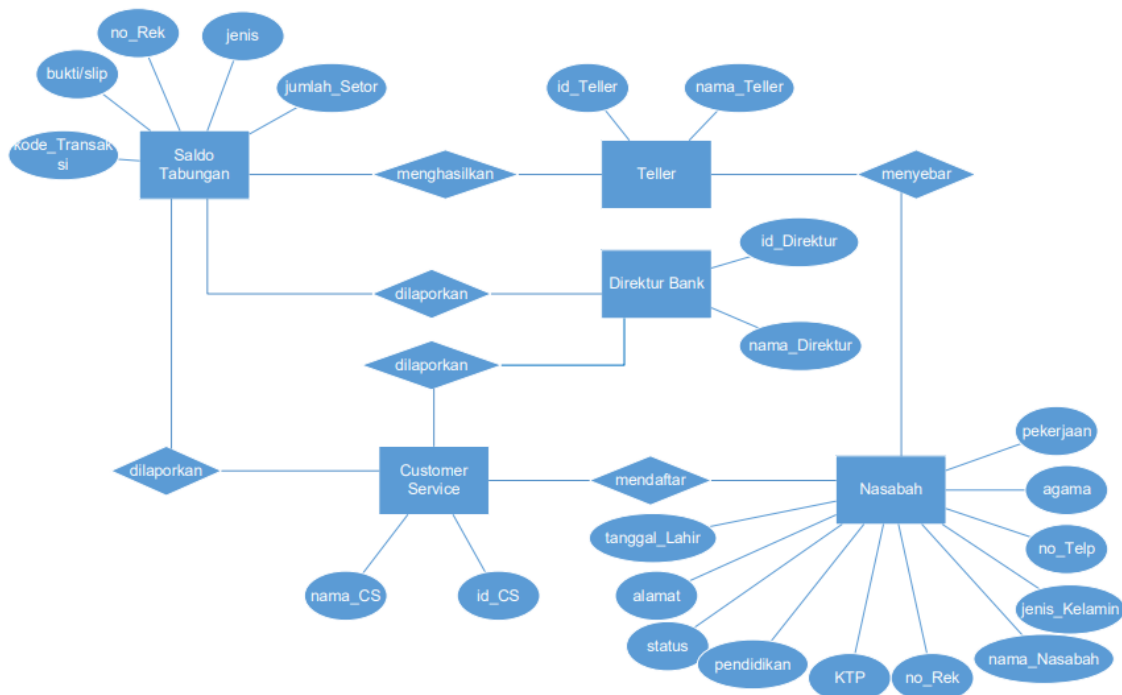


Figure 3. Chen Diagram of Entities, Keys, and Attributes

An information system model is used to describe the information system used by the current system which can be described in line with the company model. A system knowledge model visualizes the logical data model, application architecture, and CRM distribution architecture for Bank Central Asia. Logical

data models are also used to visualize key attributes and properties with company information. You can use a Chen entity diagram to describe attributes, as shown in Figure 3, which shows their relationship to Bank Central Asia Customer Service Related Units.

Application architecture is the proposed CRM design (Syafie, 2022). Additionally, the interactive CRM structure is reflected in the CRM architecture. Integrated Modeling Language is a CRM architecture used for modeling application architecture. Integrated Modeling Language contains 4 diagrams namely Activity, Sequence, Class, and use case diagrams. This use case diagram is a function that explains "What" and not "How" the system works. Each use case scenario describes a different interaction and view of the product in use. On the CRM page, each user must log in first and once the CRM user is logged in, subsequent users can create, view, change and also delete products. In addition, the Bank of Central Asia profile is reflected in the CRM architectural design, where to check it Users of this profile do not need to log in. However, things that concern privacy are not free to download, only employees who have them have an account in the CRM application. Distributed system architecture means a logical location of the created system architecture. It is easy for customers to use BCA CRM anytime, anywhere because BCA CRM uses an existing indexed database. The use case diagram is shown in Figure 4.

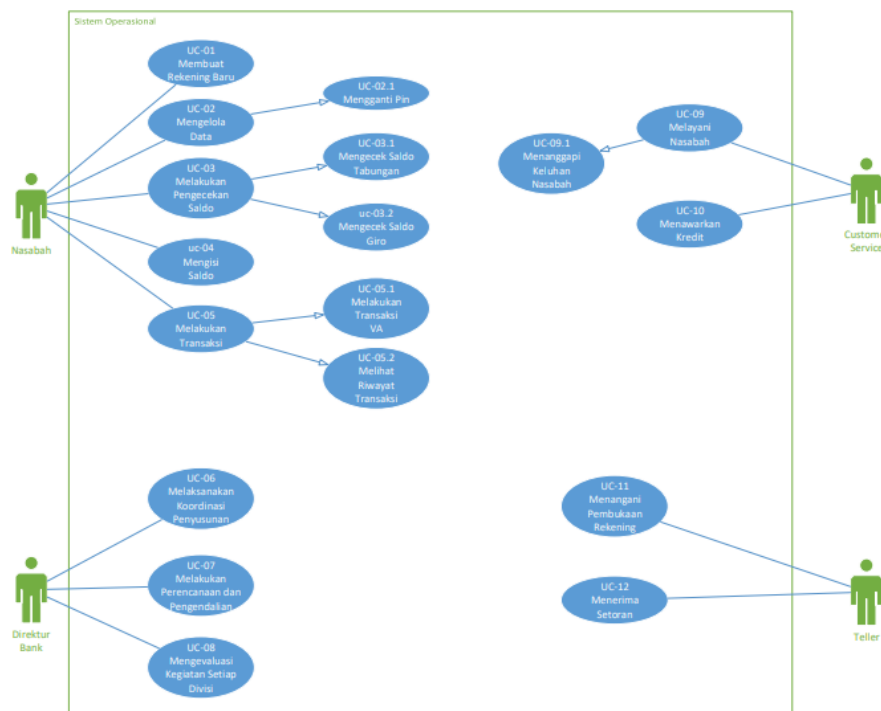


Figure 4. Use Case Diagram

The CRM application page layout is separated by each role. A page has been set up for ordinary users, which can also be accessed for free. There is also a special page that cannot be used by roles other than this party of authority such as BCA staff and administrators. Officials who can use the special page must log in with the account ordered then you can see the special page of the CRM system. If employees and admins log in with the account you entered, there are several features such as CRUD, frequently asked questions (FAQ) which are useful for customizing questions with the same context to make it easier for your other customers to ask questions or find information about the limitations you want to ask. Additionally, there is a special profile manager that can only be used by authorized parties such as employees and managers. At BCA, customer and product information is managed by a system

administrator to prevent data theft and also has the function of keeping a birthday list. Congratulations to BCA customers. BCA Bank Customer Service Guidelines standard operating procedure (SOP) functions are stored and this function is used as a guide for customers so they are not confused when they want to ask questions. Technology models describe things like software in computer information management systems.

Technology models also talk about how telecommunications and computer networks work. The physical structure of the database is discussed in the Physical Data Model column commonly used in CRM architecture. Creating a CRM database structure, the goal is to design a CRM architecture for BCA and build overall relationships. The purpose of the diagram in Figure 5 is to explain the relationships between each table in the BCA CRM database.

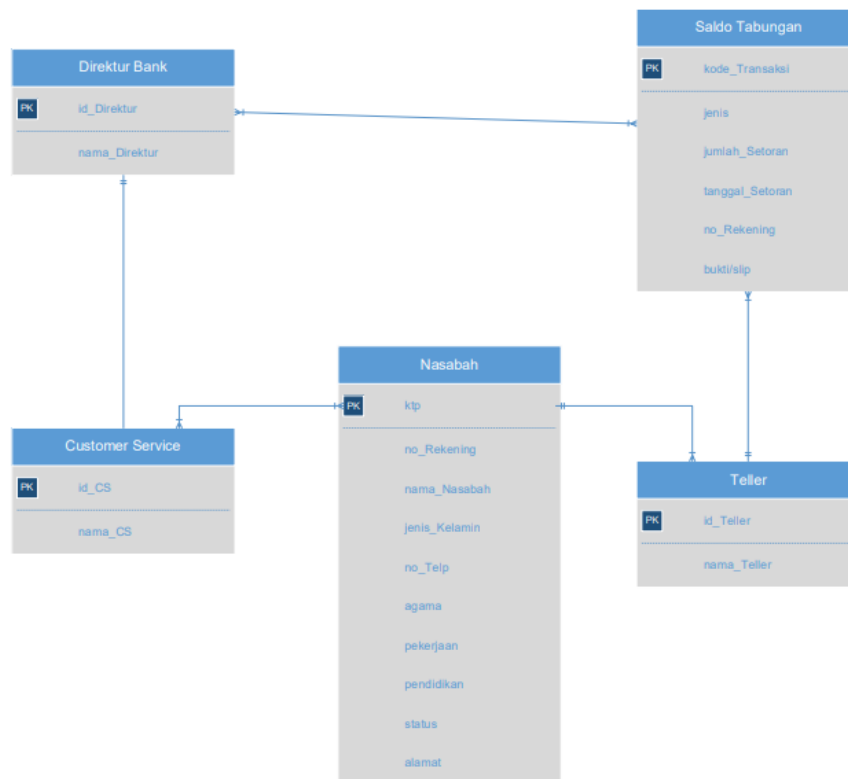
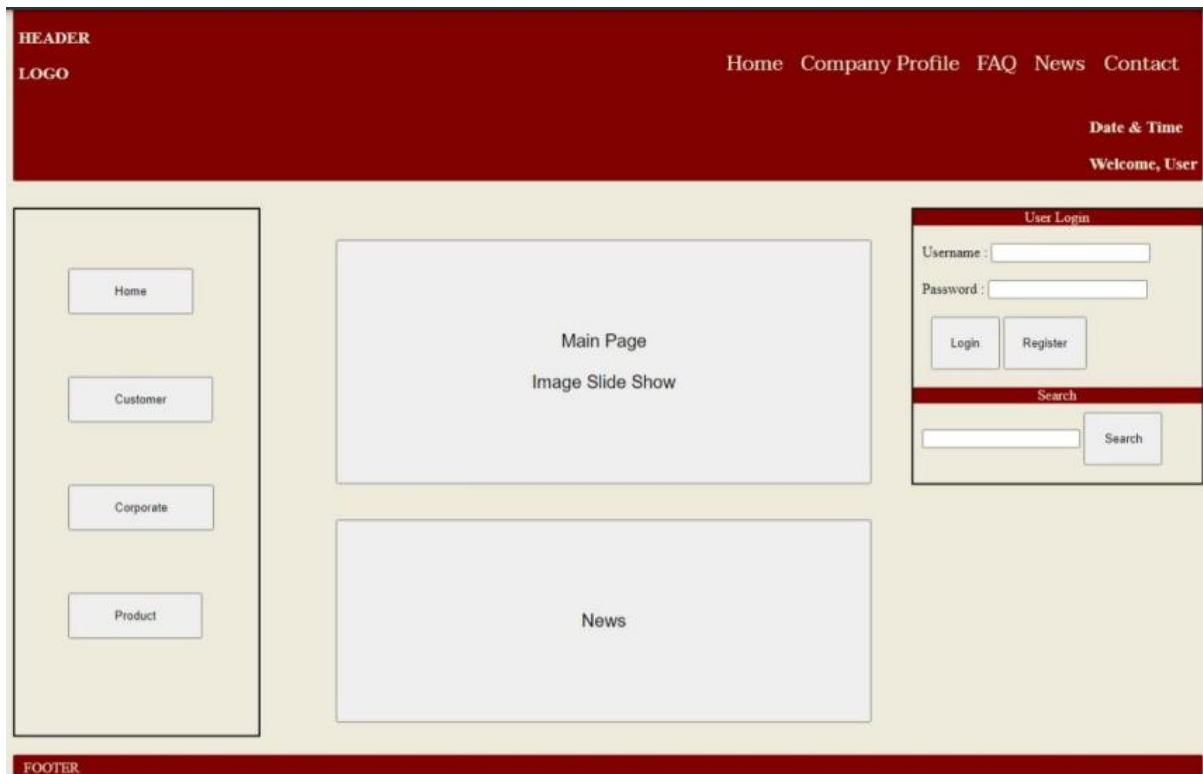


Figure 5. Crowfoot diagram

CRM planning is carried out on a computer which aims to help improve services and identify (Sumitro et al., 2023). Creating the BCA website includes designing the CRM website home page which consists of a home page, company profile, customer information, FAQs and news, as shown in Figure 6. When a user enters the CRM website, the last page displays one. information, information whether launched by BCA products or programs or information about events held by BCA for the public.

**Figure 6.** Dashboard Development

Technology architecture describes the hardware, software, and network specifications for implementing a CRM system. Star topology is a topology architecture used to build a network with access to the BCA CRM management system and a server that acts as a central controller and controls the relationship between inspectors, CS, relationship specialists and financial sales in the CRM application system. It has a high level of security, disks are easy to create or delete, and if a problem occurs on the network, it does not interfere with other networks, network damage in a star topology system is easy to find. However, the drive topology has disadvantages such as using multiple cables and increasing costs. However, this places more of a burden on users with easy access to the system to maximize server performance. Another weakness is that the switch is a critical and very sensitive component, so it is not annoying because the network starts and stops automatically if there is a problem. However, regular maintenance and check of switches can minimize system failure or malfunction. Implementation must occur on servers and client computers requiring minimum software and requirements to support the CRM system.

The technical definition of the Zachman framework includes a discussion of roles and references (Irfanto & Fernandes Andry, 2014). Additionally, all data stored in a particular computing computer is described using specific components, protocols, communication networks, and programming languages. The data in the fifth row is described as definition data, namely the physical definition of the data model, which has been explained in Wire Model Technical. Data definition includes all the data definition language for defining tables, in Figure 7 you can see the indexes and views required for a complete CRM implementation.

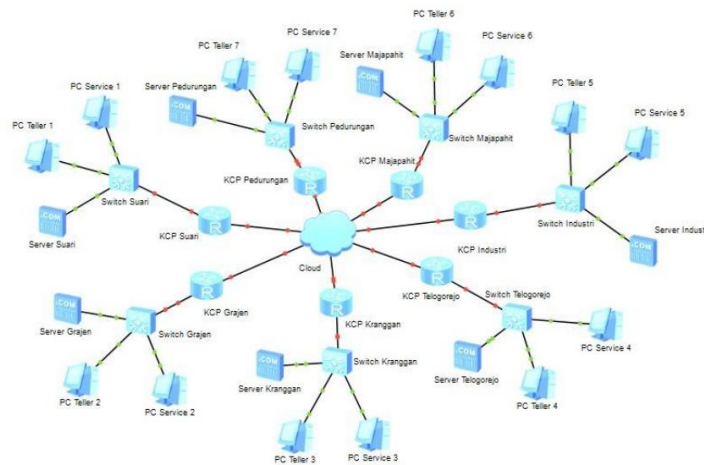


Figure 7. System Network Topology

The following is the code used to create a database in system design and the results are in Figure 8 below:

```
CREATE TABLE `crm`
(
  `prioritas_id` INT NULL,
  `prioritas_detail` VARCHAR(50) NULL DEFAULT NULL,
  `cif` VARCHAR(50) NULL DEFAULT NULL
) COLLATE='armscii8_bin';
```

#	Name	Datatype	Length/Set	Unsigned	Allow NULL	Zerofill	Default	Comment	Collation	Expression
1	prioritas_id	INT	11	☐	☒	☐	NULL		armscii8_bin	
2	prioritas_detail	VARCHAR	50	☐	☒	☐	NULL		armscii8_bin	
3	cif	VARCHAR	50	☐	☒	☐	NULL		armscii8_bin	

Figure 8 . Definition of Data in Databases

The next column is a process description. This section explains views that are not related to or part of system creation, in this case containing parts of the CRM programming language developed with a web system created with the PHP programming language in this research. PHP contains languages commonly used to develop websites. PHP is found in web servers that use code as input to create and render web pages as printed products, and can be used by various servers, operating systems, and database management systems (Lerdorf & Ferguson, 2000; Shah & Bayross, 2007). PHP is free to use, and its framework is also available as complete code that users can use to define, extend, and build systems. Banks do this by using systems to serve their customers, such as financial sales professionals and human relations professionals. However, because this system is in the form of a website, the system must run on a server using a hosting service so that it can be used by Bank of Central Asia consumers. The third column of this table is the network architecture, this column defines the network equipment characteristics of the supporting system (Sumitro et al., 2023). The network equipment configuration should be defined in detail and contain minimum recommendations for possible network configurations

according to the server computer and client hardware requirements so that the computer gets the right network for the application Optimal CRM (Budiraharjo & Nugraha, 2022).

4. CONCLUSION

The Zachman Framework is a framework used to organize and describe information and technology systems in an organization. This framework was developed by John Zachman in 1987 and has been used widely in the fields of information systems management and enterprise architecture. The Zachman Framework describes six different perspectives that must be considered in information systems development. The six perspectives will be explained below: 1) Data Perspective: Describes the data or information used in the organization, including data entities, attributes, and relationships between entities. 2) Functional Perspective: Focuses on business processes and organizational functions that involve the use of data and information. 3) Location Perspective: Shows where data, processes, and people are located in the physical context of the organization, including physical location mapping. 4) People Perspective: Involves the roles and responsibilities of individuals within the organization, including data users and owners and other stakeholders. 5) Time Perspective: Describes how data and processes change over time, including development, change, and the system life cycle. 6) Motivational Perspective: Includes organizational goals, policies and strategies that underlie the development of information systems.

Customer Relationship Management (CRM) is a strategy implemented by financial institutions to attract or retain consumers, which ultimately creates relationships between financial institutions and consumers that are profitable for financial institutions and consumers and increase consumer loyalty. With the development of this system, it is hoped that it can become a means for bank customers to do business and facilitate communication through the platform provided and to communicate when problems or issues arise. to customers through the Frequently Asked Questions (FAQ) service. Then, by continuing to establish communication, it is hoped that it can maintain customer loyalty so that the bank can provide the best service to its customers.

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