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Cloud Computing-Based Electric Payment System Application Design

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Abstract

Cloud Computing technology is a new paradigm in the delivery of computing services. Cloud Computing has many advantages compared to conventional systems. This article discusses cloud computing architecture in general and some examples of the implementation of cloud computing services and their benefits in electricity payments. The purpose of this study is to design a cloud computing-based electricity payment system. The method used in this research is the design thinking method. The results of this study indicate that the resulting design is good enough to be applied to a cloud computing-based electricity payment system.

Keyword : Cloud computing, payment systems, electricity, design thinking, PLN

Introduction

Information technology in today's world is increasingly advanced and growing rapidly. Information needs that are always up to date when an event occurs can be quickly spread and known to many people quickly through the internet media which is currently used by almost the entire world population. This can be seen from the statistical data in 2012 which reached 2,802,478,934 internet users in the world (http://www.internetworldstats.com/stats.htm, 2013). According to available statistical data in 2013 smartphone users in Indonesia reached 41.6 million users. This means that the Indonesian people automatically use the internet as a medium for communication and access to their personal data. We can get easy access and various types of information through the internet. One example is in storing or backing up data.

Electricity is the most suitable and comfortable form of energy for modern humans. The increasing consumption of electricity per capita throughout the world indicates an increase in the standard of human life. With the growth in demand for electricity, it is necessary to plan for the construction of new power centers, or create new forms of energy to support them; if the current capacity of the power center is not sufficient to support it. Based on research data at PT. PLN (Persero) Distribution of West Java and Banten as well as discussion based on theory, it can be concluded that the online electricity payment system plays a very important role in supporting the effectiveness of internal cash control, this can be seen from (1) The existence of general controls and adequate application controls. Customers make payments through online bank payment points, (2) Reconciliation of receipt of funds and bookkeeping are carried out periodically and in

accordance with (2) PPOB Online Electricity Payment System Process (Payment Point Online Bank) is a real online payment service for electricity bills and other bills -time. For this reason, it can be suggested that non-uniform understanding (there are different points of view from employees regarding the value and influence of implementing PPOB on the progress of the company) can be eliminated and can eliminate the old paradigm in conducting PLN's business processes and increase knowledge of the system's working mechanism so as to improve performance which in turn increases customer satisfaction and loyalty.

The development of information technology in the world in cloud computing technology has begun to be adapted by leading IT companies in Indonesia such as Telkom Sigma, BizNet, and Metrodata. This technology makes it easier for users to access data at any time without having to use data storage places such as hard disks or flash drives. Users also do not need to install applications on laptops or PCs to process data because the application is already provided on the service provider's server. In addition, cloud computing also makes it easier to automate data and manage it. Advances in technology such as cloud computing is an alternative for government agencies in managing state data. Country data that is not small in number certainly requires good storage so that it is easy to access and is maintained safe. This technology is able to meet the needs of storage and security. However, of course, government agencies need to analyze and review before deciding to switch to cloud computing technology. Budget data storage with this service is certainly not cheap and not always profitable. The element of confidentiality is also a consideration because it involves state assets and important secrets that should not be known by unauthorized persons. In addition, the government needs to study this technology first. The side effect of choosing this technology is that more and more employees have reduced their work because it has been done by employees of the cloud computing service provider. This needs to be considered by leaders in government agencies.

Cloud computing (cloud computing) is a combination of the use of computer technology (computing) and internet-based development (cloud). Cloud computing is an information technology service that provides devices or infrastructure via an internet connection to meet the needs of service users. Cloud computing service providers such as Microsoft Cloud, Google, and Sales Force. Cloud computing is a general concept that encompasses SaaS, Web 2.0, and other well-known recent technology trends, with a common theme of reliance on the Internet to provide users' computing needs. For example, Google Apps provides common business applications online that are accessed via a web browser with software and data stored on servers. Cloud computing is currently the latest technology trend, and an example of this form of development of Cloud Computing technology is iCloud.

Types of cloud computing services are divided into 3, namely: SaaS (Software as a Service), certain application services that users can use by subscribing such as sales software on salesforce.com, Yahoo Premium on Yahoo, LotusLive! and Microsoft Office 365. PaaS (Platform as a Service), a service that provides ready-made modules used to develop applications, runs on these platforms such as game development on Facebook, Google Android, and Apple i-Tunes. IaaS (Infrastructure a Service), a service that rents out devices to run applications including storage media, processing power, memory, operating system, and capacity.

PIECES analysis

Determining cloud computing is feasible to be applied in government agencies is certainly not easy. Government agencies need to conduct an analysis beforehand so that the budget to be used in activities in the current year does not exceed the predetermined budget. Therefore, government agencies need to conduct an analysis of performance, economy, control, efficiency, and service or also known as pieces analysis. The understanding of the analysis of pieces as follows (Hanif Al Fatta, Analysis & Design of Information Systems: 2007):

System Performance Analysis (Performance)

Performance is a system's ability to complete tasks quickly so that goals can be achieved immediately. Performance is measured by the amount of production (throughput) and the time used to adjust job transfers (response time). Weaknesses: 1) Requires an internet connection even though not all regions in Indonesia already have an internet connection. 2) Internet connection in Indonesia is not stable and inadequate.

Information Analysis (Information)

Information is important because with this information management (marketing) and users can take the next step. Pros: Information is easily accessible from all over the world when using cloud computing services. Disadvantages: The cloud computing service provider may not necessarily be able to maintain the confidentiality of the information stored on the server.

Economic Analysis (Economy)

Utilization of the costs used from the use of information. The increase in economic needs affects cost control and increased benefits. Pros: 1). Save the cost of employee salaries every year. 2). Reducing the cost of procurement and maintenance of ICT infrastructure. 3). It does not require a fee for government employee training because the costs are incurred by the cloud computing service provider who will conduct training for its employees. 4). It does not require a license fee for the software used because the cloud computing service provider will do it. Disadvantages: If the cloud computing service provider does not carry out maintenance properly, government agencies will lose out.

Control Analysis (Control)

This analysis is used to compare the systems being analyzed based on the terms of timeliness, ease of access, and accuracy of the processed data. Pros: The cloud computing service provider is responsible for suspicious activity on the server. Disadvantages: 1) State information security is not necessarily well maintained because many crackers/hackers have the expertise to steal and even destroy data stored in cloud computing services. 2). Government agencies need to control the quality of the servers used by cloud computing service providers. 3). There needs to be a contract for the employee who maintains the server on the cloud computing provider in order to maintain the confidentiality of the data stored on the server.

Efficiency Analysis

Efficiency relates to how these resources can be used optimally. Operations in a company are said to be efficient or not usually based on the duties and responsibilities in carrying out activities. Pros: 1). The time required to access data is faster. 2). Easier operation and management. 3). Does not require a hard drive or laptop to store data.

Service Analysis (Service)

Service improvement shows various categories. The selected project is a better service improvement for management (marketing), users and other parts which is a symbol of the quality of an information system. Pros: The cloud computing service provider provides update and configuration services to make the work of employees in government agencies easier.

Method

This research uses Design Thinking method. Design thinking method is the process of creating new and innovative ideas that are used to solve a problem. Design thinking is not limited to a particular industry or area of expertise.

1. Emphasize (empathy)

As a designer, the problem you are trying to solve is often not your own problem, but rather the problem of a particular group of people (users). When creating designs, it is important to understand themselves and what is important to them.

a. Observe (observe)

Observing what people (users) do and how they interact with their environment helps you to understand their needs.

b. Engage (engage)

Engaging with people directly can help express their way of thinking and the values they hold. We can understand the views of users through stories and the things they do.

c. Immerse (feel immediately)

After observing and engaging with the user, it is important to experience the user experience firsthand. Discover (or if necessary create) experiences so that you can feel the situation experienced by the user.

2. Define (determine)

Determining the problem focuses on a specific user based on insight and user needs.

3. Ideation (generating ideas)

Issue ideas that can be solutions to problems.

How to generate ideas:

a. Prototyping

b. Bodystorming

c. Make mind maps

d. Sketch

4. Prototype

Apply the ideas that have been collected into a physical form, it can be in the form of post-it notes pasted on the wall, role play activities, objects, or even storyboards.

5. Test (trial)

The test stage is an opportunity to improve your solution and make it even better. This step can be repeated until we get the best results.

Results and Discussion

1. Observe (observe)

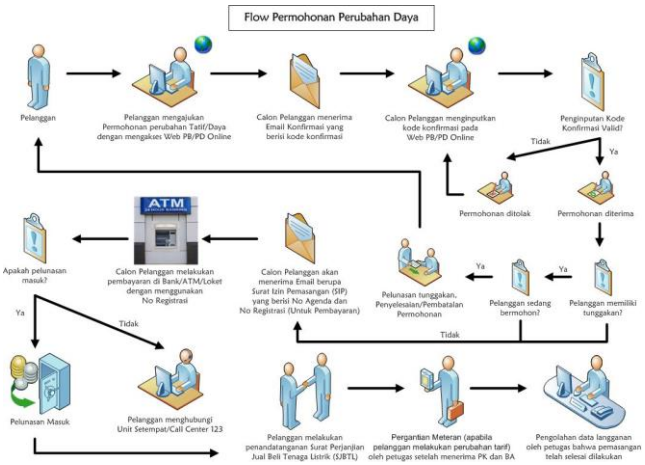
Observe what people do in making electricity payments and engage directly with people who make payment transactions and interact to deepen relationships to make it easier to understand a customer.

2. Define

- Remote places of payment in remote villages
- Many customers complain because the payment process is queuing

3. Ideation (generating ideas)

Creating a cloud-based electricity payment system.



Requirements

1. Fast electricity payment process.
2. Payments can be made anywhere.

From the resulting design, it can be seen that the system is connected to the internet. In the internet infrastructure, cloud computing is used as the basis. The system is run through cloud computing and can be accessed using various electronic devices such as laptops and smartphones. The system runs if it is connected to the internet via an available internet network

Conclusion

From the results of the discussion, it can be concluded that the design thinking method is very well used in designing applications. The resulting application design is very good to be implemented in the electricity payment system. This payment system can be run on a cloud computing basis so that it becomes easier and more accurate in the payment process. Cloud computing-based electricity

payment systems can be accessed from various places and various devices such as laptops and smartphones.

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