PROTOTYPE APPLICATION AS THE IMPLEMENTATION OF SOFTWARE AS A SERVICE

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ABSTRACT

Cloud computing is an internet-based computing process, and Software as a Service is a software in the form of services that are part of Cloud Computing. Cloud computing as a form of market will grow rapidly, can be used as a means of marketing and supply services or goods. This application become a meeting point of the supplier of goods/services with consumer goods / services.

Keywords : *SaaS*; *Cloud Computing;* **Service Search; Bussiness Application;**

I. Introduction

Cloud Computing is a new paradigm in computing that change our point view of technology. Cloud computing in simply way means a service provider who provides services to cloud computing, and there are no longer requires hardware except virtual ones. In clouds computing there is a collection of computing resources that been integrated services, and have high scalability and elastic. Its said high scalability due to its easier to expand resources on server and does not require a long time, while its said elastic because it is easy to add storage capacity, such as memory or a harddisk.

Since economic crisis in Indonesia, the growth of the private sector is increasing, the number of entrepreneurs in Bandung is increased. This also applies to the city of Bandung, Typical of bussines due in Bandung are most entrepreneurs offering goods or food, such as maicih. In addition, there are many business opportunities to offer services, such as business traveling or delivery goods. The majority of entrepreneurs in Bandung is a small to medium-sized businesses (UKM – Usaha Menengah dan Kecil), which had business assets does not exceed amount two hundred milion rupiah, the assets not including business building.

There are still a lot of businesses and services that do not have a fixed place of business land for the services they offer their products or services, So

that many entrepreneur use social media like facebook, twitter and websites related to market it. So, how the consumer find the business services offered? At least as a consumer or business user looking for services by coming directly to store where the place of business or their associated services, or utilizing a variety of social media such as facebook, twitter, and business related website services they offer. Even, look through the search engines like google, yahoo and bing. How much time and how many options there are to find a service that appears on the search engines. So too time consuming to search for products and services required.

There are still a lot of businesses and services that do not have a fixed place of business land for the services they offer their products or services, So that many people use social media like facebook, twitter and websites related to market it. And what about the consumer to find the business services offered? At least as a consumer or business user looking for their services by coming directly to the store where the place of business or their associated services utilizing a variety of ways such as actively mediated social facebook, twitter, and business related website services they offer. It may even look through the search engines like google, yahoo and bing, How much time and how many options there are to find a service that appears on the search engines. So too time consuming to search for products and services required.

Based on that text above, we will make a prototype for Provision of services/goods, so they do not need to display the product and services in social media, and do not need to build their own websites, but only in simply register business services. The idea of application of cloud computing bring together between the provision of services/goods to the goods/services users is very beneficial.

The remainder of the paper is organized as follows. The next section reviews relevant literature to built software of research, tools and methodes that use during software making, analysis and result of building research software and conclusion.

II. Literature

The initial idea of cloud computing in the 1960s, when John McCarthy, MIT computing expert who is also known as one of the pioneers of artificial intelligence, expressed the vision that "someday computing will become public infrastructure, such as electricity and telephone". But only in 1995 was, Larry Ellison, founder of Oracle, gave rise to the idea of "Network Computing" as a campaign to challenge the dominance of Microsoft which was then dominated desktop computing with its Windows 95. Larry Ellison offered the idea that the user does not actually require a variety of software, ranging from operating system and various other software, crammed into their Desktop PC. PC Desktop can be replaced by a terminal directly connected to a server that provides the environment that contains various software needs readily accessible by the user.

Cloud computing concept is usually regarded as the internet, because the Internet itself is described as a big cloud (typically in the network scheme, denoted as the internet cloud) that contains a set of interconnected computers.

Cloud computing comes as an evolution refers to the convergence of technology and more dynamic applications. Where there is a major change has implications for almost every aspect of computing. For end users, cloud computing provides a means to improve services or allocate computing resources more quickly, Based on business needs.
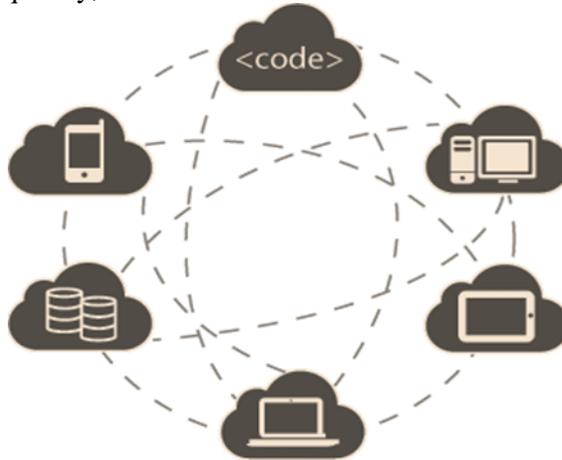
Fig-1. *Cloud computing*

The presence of the concept of ASP (Application Service Provider) in the late 90s. Along with the increasing quality of computer networks, enabling faster access to applications. It is perceived as an opportunity by some owners to offer data center facilities as a 'hosting' an application that can be accessed by customers through a computer network. Thus customers do not need to invest in the data center

According Peter Mell and Timothy Grance (2012:2) define Cloud Computing is a model that allows for ubiquitous (wherever and whenever), Convenience, On-demand network access to computing resources (eg, networks, servers, storage, applications, and services) that can be rapidly released or added. Cloud Computing as an information technology services that can be utilized by users with network-based/internet. Where a resource, software, informationa and application are provided by other computers that need. Cloud computing has the two words "cloud" and "Computing". Cloud which means the internet itself and Computing is a computing process.

Cloud computing types are :
1. Public Cloud, the cloud type is intended for the public by the service provider.
2. Private Cloud, the Cloud infrastructure services, which operated only for a particular organization. Cloud infrastructure that can be managed by an organization or by a third party.
3. Community Cloud, which is a cloud infrastructure is shared by several organizations that have similar interests, for example in terms of its mission, or the level of security needed, and others.

4. Hybrid Cloud, namely the incorporation of both public and private. For this type, Cloud infrastructure available is a composition of two or more cloud infrastructures (private, community, or public). although they remained stand-alone entities, but connected by a technology / mechanism that enables data and application portability between the Cloud. For example, the inter-Cloud loadbalancing mechanism, so that resource allocation can be maintained at optimal levels.

The soaring popularity of Cloud Computing while in the early 2000s, since ex VP at Oracle, Marc Benioff, launched a CRM application service (Customer Relationship Management) as form of Software as a Service, Salesforce.com. In 2005, began to emerge initiative driven by big names such as Amazon.com to launch Amazon EC2 (Elastic Compute Cloud), Google with its Google App Engine, as well as the blue giant IBM launched Blue Cloud Initiative. All these initiatives were still expanded, and the form of Cloud Computing still keep looking its best, both in terms of practical and academic side.

Information technology in Indonesia is still lacking "enthusiasts" about Cloud Computing, there perhaps several factors, including :
1. Penetration of the Internet infrastructure is arguably still limited (bandwidth is still limited)
2. Maturity level of internet users, who are still making major internet media as a medium of entertainment or socialization.
3. High investment required to providing cloud services, because they have a combination of network infrastructure, hardware and software as well.

Five criteria that must be met by a system to be able to enter the family Cloud Computing, namely:
1. *On Demand Self Service*
   A customer can possible to directly "order" required resources, such as processor time and storage capacity via an electronic control panel that is provided. So no need to interact with the customer service personnel to increase or decrease the computational resources required.
2. *Broadband Network Access*
   Services are available connected via broadband networks, especially for adequately accessible through the Internet, using a thin client, thick client or other media such as smartphones.
3. *Resource pooling*
   Cloud service provider, providing services through resources that are grouped in one or many locations data center consisting of a number of servers with multi-tenant mechanism. This mechanism allows multiple amount of computing resources used jointly by a number of users, where those resources either in the form of physical or virtual, can be dynamically allocated to users needs or customers on demand. Thus, customers do not need to know how and where the demand for computing resources met by the service providers. Importantly, every request can be

fulfilled. The computing resources include storage, memory, processor, bandwith and virtual machine.

4. *Elastic (Rapid elasticity)*

   Computing capacity that can be provided rapidly and elastically supplied, it can be increasing or decreasing necessary capacity. For customers themselves, with this ability as if the available capacity is not limited, and can be "bought" anytime and whatever amount.

5. *Measured Service*

   Available cloud resources should be managed and optimized its use, with a measurement system that can measure the usage of each computing resource use (storage, memory, processor, bandwidth, user activity, etc.). Thus, the amount of resources used can be measured in a transparent manner that will be the basis for the user to pay for the cost of using the service.

Based on the type of cloud-computing services is divided into three service models, namely :

Fig-2. C*loud computing model*

1. SaaS (Software As A Service)

   Providing services such as applications that can be used by consumers that are running on cloud infrastructure. Examples of SaaS service provider is gmail, google docs, office 365, and SalesForce.
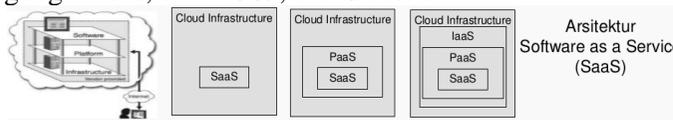

Fig-3. SaaS Architecture model

2. PaaS (Platform As A Service)

   Providing a platform (programming language, tools, Web servers, databases) that are useful for applications development that running on a cloud infrastructure and the results can be used for consumer. Examples of PaaS providers, OpenShift, PHPCloud, AppFog, Heroku and Engine GoogleApp
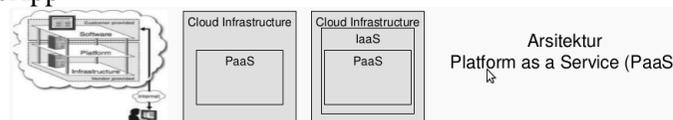

Fig-4. PaaS Architecture model

3. IaaS (Infrastructure As A Service)

Providing resources processing, storage, network capacity, and other computing resources. Examples of service providers and TelkomCloud Amazon EC2.
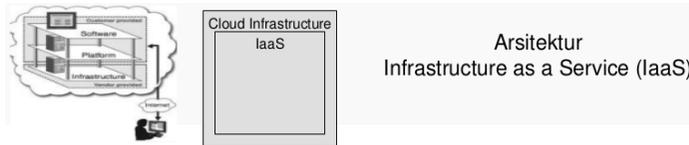

Fig-5. IaaS Architecture model

III. Tools and methode

This study uses a descriptive research methodology, with procedure order :

1. To identify and choose a problem;
2. To formulate problem and define goals;
3. To collect and analyis data;
4. To choose a development system methode;
5. To analysis data processing.

Development system methodes that been using in this research is prototype. In a prototype, a new product originates as an idea. The idea is a descriptive statement that can be written or only verbalized. The idea is refined into a product concept that includes consumer benefits and features of the product. The concept is developed into a prototype.

The sequences of prototype :

1. Identify basic requirement

   Determine basic requirements including the input and output information desired.

2. Develop Initial Prototype

   The initial prototype is developed that includes only user interfaces.

3. Review

   The customers, including end-users, examine the prototype and provide feedback on additions or changes.

4. Revise and Enhance the Prototype

   Using the feedback both the specifications and the prototype can be improved. Negotiation about what is within the scope of product may be necessary. If changes are introduced then a repeat of steps #3 and #4 may be needed.

The approach system is object oriented, with UML (Unified Modeling Language) as a tool to modeling a system. UML diagrams that will be use are use case diagram, Class Diagram, Component diagram and Deployment diagram.

IV. Analysis and Result

In a market, there will be two parties connected, that vendor (services/goods provider) to buyer (consumer services/goods), so if it is described in use case diagram there would be two actor, seller (penjual) and buyer (user).
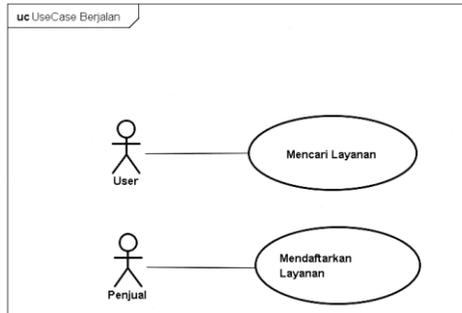

Fig-6. Use Case diagram

In making prototype of a SaaS concepts, there are two main goals, namely:
1. Provide a special website for service searcher. In order to facilitate search for business services and services required by the user (user).
2. Provide services to small and medium enterprises to develop business and services in right media, so it can increasing entrepreneurship in Bandung

Based on the purpose and results of evaluation, we proposes several key functions that are found in prototipe below.
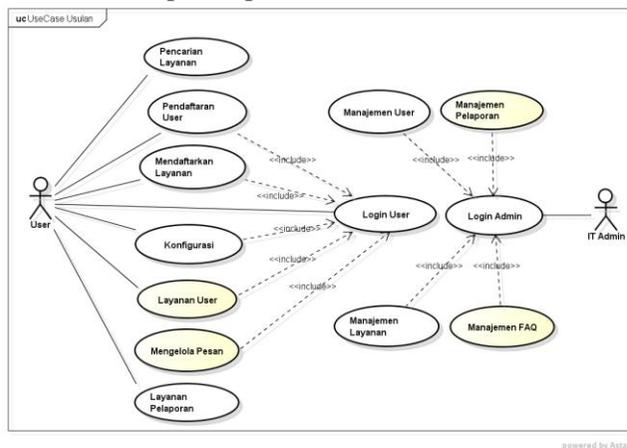

Fig-7. Use Case diagram with its functionality

In use case diagram there are 2 (two) actor who will interact with the system, that actor users can be service seekers and service providers and IT Admin, and overall there are 13 (thirteen) function.

These function describe into one use case, namely : (1) Search Service use case, actor user can search for services offered by the seller in through contacts, location, email, and type of services. (2) In the User Login use case, a

user logs in by fill e-mail address and password, and the system will validate user, (3) User Registration use case, users who want to involved in the system, either as a service seekers or providers, ought to register the data itself, then system will verified and validated data. (4) Registering on Service use case, the user who already registered must register its services, this applies to the user as a service provider. (5) Configuration use case is an internal function for checking and updating user password. (6) In User Services use case, the user will perform the configuration of registering service use case. (7) Managing message use case is a use case for managing messages from service seeker and giving fed back to be readable by user search service. (8) Reporting Services use case is a use case that manages all the input from user and displaying on the admin page. (9) Admin Login use case is a use case for admin to log in application. (10) User Management use case is a use case that is used to manage the membership user in the system. (11) Management Service use case is admin use case to manage services that have been registered. (12) Management Reporting use case is a use case that used to manage the response given by user as member or guest. (13) Management FAQ use case is a use case that used to manage all the possibilities of answer frequently asked by users

Class diagram is diagrams used to show some class and packages that exist in the software been developed. Class diagram gives an overview gives an overview of the software and relationships. The following class diagram:
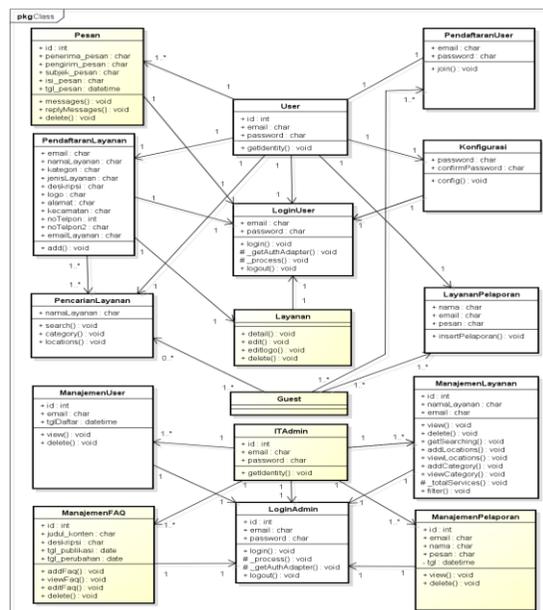

Fig-8. Class diagram

Component diagrams are module program, there are libraries, files that use while program was running, as seen in Component diagram below:
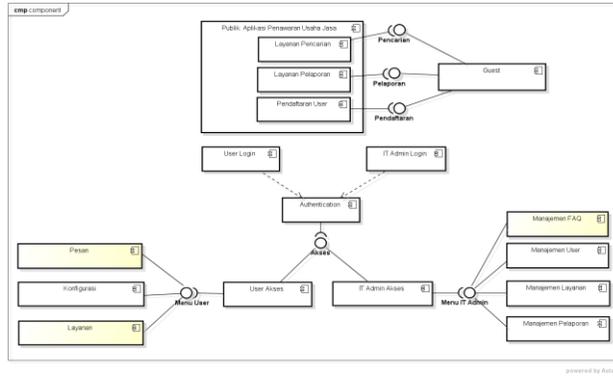
Fig-9. Component diagram

Deployment diagrams show the physical layout of a system and show each node in network, relationships between the node itself and process that will run on each node, that can seen in deployment diagram below :
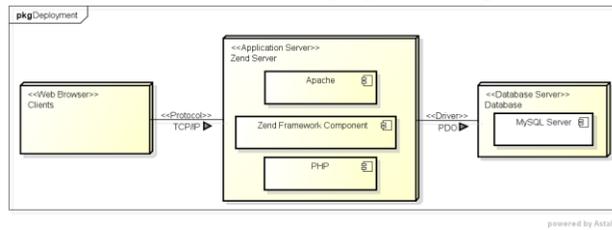

Fig-10. Deployment diagram.

Network architecture can be regarded as a physical description of the pattern of relationships between network components, which includes the following server and client computer design network architecture:
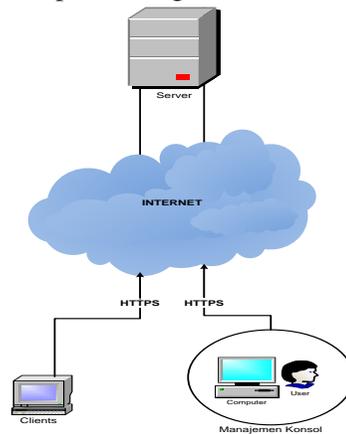

Fig-11. Network Architecture.

This network architecture is WAN (Wide Area Network). This network architecture includes Server, Client, which a console management managed by

user or admin. As cloud computing architecture is divided into 2 (two) sides, front end and back end, which front end as a computer user (client) connected in a network that typically uses the internet, and back end consisting of several or many computers and data storage are connected in the network "cloud".

V. Conclusion

From the results of direct observation of the object of research, the authors can draw conclusions about Prototype Saas :

1. That prototype can be build as applications for services business offers and search services
2. This application can provide the right media to publish information of business services.
3. This application makes consumer who search services more easily find the information that offered in this application.

For further development, we can built this application not only in SaaS model, but we can build to IaaS model. This application can expandable, that seller, who provide services can entering more than one service, and that area coverages not only in Bandung.

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