

Integration of E-Commerce and Cloud Computing For Implementation of Business Based on ICT in Indonesia

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Abstract—Cloud computing is an innovation of technology that can be used for implementation of business based on Information and Communication Technology (ICT) in Indonesia. It is supported by the increasing of e-commerce growth and cloud computing itself. The integration between e-commerce and cloud computing is one of the solution on improving economic growth based on technology. In its implementation, businessmen can choose suitable services by considering their resources. In this paper, we explain about the integration of e-commerce and cloud computing that consider the aspects of business growth and technology in Indonesia.

Keywords—Cloud Computing, E-commerce, ICT.

I. INTRODUCTION

THE growth of information and communication technology (ICT) increase rapidly, both globally and nationally. In business world, the use of ICT is a transformation from a conventional business (offline based) to an online based business. ICT is a technological innovation that expected to support the growth of the state economy. Online based business or commonly known as e-commerce increasingly supported by number of Internet users in Indonesia. According to Nielsen (2011), quoted from kompasiana, internet users in Indonesia ranks 5th in Asia, with the number 40-50 million, after China, Japan, India, and South Korea [1]. As well as still from the source, stated in March 2010 that 68% of internet users are doing online shopping [1]. This is a very good potential for business in Indonesia to apply online business based or e-commerce.

According to the predictions of the International Data Corporation (IDC) quoted from tekno.liputan6.com, there are 10 ICT development in Indonesia in 2013. The three points include business start-up ICT will increase from year to year, spending increased ICT infrastructure, and cloud computing is increasingly understood [2]. From the first point can be observed that the business based on ICT in Indonesia is growing from year to year. From the second and third points can be used as integration of technology utilization for business, by utilizing cloud computing technology to press infrastructure spending that can reduce the budget of the company business.

Cloud computing refers to an abstraction of a computational method, in which the related capabilities of information technology are presented as a service. The concept of cloud computing may be adopted for the implementation of an online business as a service. Based on previous research conducted by Fardani and Surendro (2011) on the adoption of cloud computing strategy on SMEs in Indonesia, stated that, the application of cloud computing can be a solution to SMEs information technology which more effective and efficient, and can improve the performance of business processes of SMEs with limited resources, both in terms of capital, human resources and marketing network [3]. Also stated that the adoption of the strategy is to do with the early stages of learning, analysis, evaluation of solutions, adoption, and management phase [3].

From the problems that mentioned earlier, this research aimed to analyze the development of e-commerce and cloud computing in Indonesia, as well as carry out the implementation of cloud computing technology to support online business or e-commerce in Indonesia. Further on in this paper is divided into several sections. Section 2 is the definition of exposure and the development of online business or e-commerce, and cloud computing, especially in Indonesia. Section 3 is a discussion of the implementation of e-commerce that integrated with cloud computing. And section 4 is the conclusion.

II. ECOMMERCE AND CLOUD COMPUTING

A. Definition and Developments of E-Commerce in Indonesia

E-commerce is the process of buying, selling, distributing, marketing of products, services, and information that can be accessed through an electronic system using computer networks to perform business communications and commercial transactions such as the Internet or other computer networks [4].

Because e-commerce is conducted in a digital format, sending data in a hard copy form could be left behind. E-commerce can be used as a solution to assist the company to expand the company that dealing with business pressures. The growth and the presence of e-commerce in Indonesia as the new transaction media, can be profitable for peoples by saving costs and time for someone who are being a consumers, producers, and sellers.

There are positive values of the e-commerce such as, a new revenue stream that may be more promising than the traditional transaction systems, to increase market share,

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expand coverage, reduce operational costs, increase customer loyalty, improve supplier management, shorten production time, improve value chain [5].

According to the survey the proliferation of e-Business 2012, approximately 36% of businessmen who apply the e-commerce in Indonesia has increased their income between 26-50% and the remain 16% had increase their income between 51-75%, it shows that the use of e-commerce could have a positive impact on their income [6]. Thus, e-commerce can be a promising business in Indonesia because its development is very significant, and supported by a large number of potential people and distance between far apart regions or provinces in Indonesia.

B. Definition and Developments of Cloud Computing in Indonesia

Cloud Computing consists of two words, Cloud and Computing. Cloud is the internet cloud, cloud on the cloud computing is a hardware and software data center, whereas computing is a computing process [7]. So according Armbrust, Cloud computing is the realization of a dream long-term benefits of computing has great potential in the transformation of the information technology industry and making software more attractive as a service [10]. And here is the definition of cloud computing according to the National Institute of Standards and Technology (NIST): "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction [8]."

According to the NIST cloud computing service models [9] is divided into three models, as follows: (1) Cloud Software as a Service (SaaS). Cloud capability in providing for the using applications by its customers that running on a cloud infrastructures. Users without knowing, manage, and controlling how the infrastructure behind it. Examples are Google App and Salesforce CRM. (2) Cloud Platform as a Service (PaaS). Cloud capability in providing services for the customer to deploy an application to a particular programming language with tools and infrastructure provided by the cloud. As with SaaS, this service does not allow customers to manage and control the infrastructure behind the cloud, but the customer is possible to control the application hosting environment configurations. Examples of PaaS services are Goggle Engine, Appfog, Salesforce Platform and Windows Azure. (3) Cloud Infrastructure as a Service (IaaS). The capability that provided to the consumer is the supply, storage, networks and other fundamental computing resources where the consumer can build and run the software, which can include operating systems and applications. The customers just rent the resources that have been provided without having to buy their own servers and network equipment, so customers can improve the efficient use of resources and information technology to reduce costs. Examples of IaaS are Amazon and IBM.

In the cloud computing is also known as two kinds of deployment models, the public cloud and the private cloud. Public cloud is a cloud that is sold by a company, whereas

private cloud is a cloud that runs on the LAN network. According Purbo, quoted from Daily Social, users in Indonesia can utilize private cloud that can save server, because for public cloud needs a good network, whereas Internet network in Indonesia still less good, except in the major cities [10]. However, the development of cloud computing is not completely obstructed by this problem. This is evidenced by the increasing use of cloud computing services in Indonesia. In 2012, growth was 20% for the corporate segment, outpacing the growth of IT industry in Indonesia where growth was only 19% [11]. Increased corporate is going along with the increase of people who spirited entrepreneurs who do business.

III. INTEGRATION OF E-COMMERCE AND CLOUD COMPUTING

Trends in cloud computing affects on some aspects of the IT world, with a growing number of applications in the IT field which make the transition to cloud computing. For example, e-commerce began to make the transition to cloud computing [12]. Cloud computing can help consumers and businessmen to use applications without doing an installation. In addition, the conveniences which they get by using cloud computing is, they can access files or data on any computer easily.

Cloud computing technology will be an efficient solution when used in business (enterprise), where each company has data with a very large number, such as structured data from client data, product data, transaction data, to trading data. Because this technology centralizing storage, memory, processing and bandwidth that can reduce the cost of the infrastructure, so it can save the budget and increase corporate profits.

Types of cloud computing services which can be used to be applied for businessmen or entrepreneur in e-commerce, for example by utilizing the services of SaaS and IaaS service. SaaS that can be used for example by using storage media contained in the cloud for storing the company data archives, or by using application that is provided to manage customer relationship (CRM) without having to do the installation.

In Indonesia, the use of SaaS services for SMEs or enterprise, may not have many problems. Because now many SaaS services which free and paid can be accessed easily on the Internet network in Indonesia. Although it is possible that there are regions that still have a difficulty to access. For IaaS services, it is not deniable that the access would be difficult to reach, if the network is not really good. Services will only be accessed by the company or the customer in major cities, which have a network that indeed quite better. So IaaS services as support of the implementation of e-Commerce in Indonesia, mostly possible that can only be done by big companies entrepreneurs or large-scale enterprises.

Beside supporting the infrastructure of e-commerce, trust is one of the most important thing in the development of the e-commerce itself [6]-[13]. Increasing trust can be seen from various aspects, such as the integrity and security of the payment system. In the development of e-commerce, integration with cloud computing can also increase consumer trust of the e-Commerce users itself. For example, by using a

cloud service that has been very reliable, such as Google, Amazon, Appfog, and Salesforce in running an e-Commerce service is [14]. Besides increasing the trust, this integration can also suppress or reduce the cost of the development. One example of the integration that can be done is to use a cloud-based PaaS services.

PaaS is the most suitable to be applied in the implementation of e-commerce in Indonesia, because it can be used to reduce the cost for businesses to implement e-commerce. The examples of the application of PaaS services on e-commerce in Indonesia is in the web development or the e-commerce application. In general, implementation of PaaS to develop e-commerce web or application are not much different from software development, but have to be integrated to cloud computing. There are several stages that used on PaaS services, the stages will include:

1. The planning stage of identifying the problem, determining the purpose of the system, and look for alternative solutions.
2. The analysis stage, which is to determine the system requirements and analyze alternative cloud service platform that is suitable with the system requirements.
3. The design stage, which determines the specifications to fulfill the system requirements, that includes the database design, business processes design, and interface design. At this stage, it should be ensured that the platform could be integrated with a well used.
4. The implementation stage, which is the system development through the instructions that is understood by machines or computer with the programming language on the platform that provided by the cloud.
5. The support stage, which is to maintain the system productivity after installation and testing.

The e-commerce web or application development is beneficial for small and medium entrepreneur in Indonesia which want to increase sales to do the promotion on the internet. They can utilize the e-commerce platform in developing web, such as Prestashop, Zen Cart, Magneto, Drupal Commerce, and others. However, for most small and medium entrepreneur in Indonesia do not have to worry even if they have a limited budget to do the promotion. Because they can choose the e-commerce platform which is open source or free. For example, selecting a free platform like Prestashop. And then, Prestashop can be used to integrated with the environment development system in the cloud. The environment development must be in accordance with the the system requirements. For example, the system requirements are as follows, PHP is a programming language and MySQL is a database. Then, Appfog selected as the suitable platform services. Then the system is implemented on a cloud, with the Prestashop installation and the development of a database on the server. After the installation and the integration database is done, then performed the management of the system or the e-commerce sites. Management of products, customers, transactions, and other things related to the e-commerce system can be performed on the dashboard that provided by Prestashop. Besides, the process of web development for large businesses, is not much different. Because basically the process of web development is built with the same steps.

However, the difference is in the selection of the e-commerce platform and services platform in the cloud itself.

So, businessmen can develop services and e-commerce system with the tools and infrastructure provided by cloud. For the implementation of the e-commerce among small and medium entrepreneurs which have limited resources and want to develop and expand marketing with e-commerce, can use cloud services that are free or have a low cost. However no need to worry about the integrity and security, as many cloud service providers have good integrity and the cost can be customized to the requirements, and with good infrastructure as well, especially for a provider whose name has been extremely reliable. For large-scale businesses can select cloud service providers with greater costs, the advantages provided by the service provider, such as a more complete tools, infrastructure more reliable, and more other benefits. So to select the service, a businessmen should be smart to know the requirements, budgets, and resources owned in the implementation of the e-Commerce.

IV. CONCLUSION

It can be observed that the integration of e-commerce and cloud computing beneficial both to the development of the implementation of technology or ICT-based business in Indonesia. Usage types of services can be targeted for businesses when considering its resources. With a use of cloud computing services that appropriate, businessmen may have a benefit from the implementation of business based on e-commerce. However, this integration should be supported by the development of internet network infrastructure to be better and more reliable, so that the implementation of the integration between e-commerce and cloud computing can work better in Indonesia.

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