

The Role of Big Data and Cloud Computing for Technology Based Business

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Abstract—Modern digital life have been produce giant data in every sectors. This big data need new approach as cloud computing term. The combination of these two technology have been used by SMEs. Smartphones enable the dissemination of the applications to customers around the world. Three most popular sectors in adopting big data and cloud computing are market places business, online transportation, and online travel agents. The study showed that the adoption of big data and cloud computing gained big success for SMEs.

Keywords—*Big Data; Cloud Computing; Technology-Based Business*

I. INTRODUCTION

Recent advancements in information technology (IT) such as internet have been created some new opportunities in many sectors. One of the most influential areas of IT development is in business. Daily transactions in a business requires a lot of activities involving large amounts of data. Modern business transactions move from conventional method into cyber era. In cyber era, almost of business transactions involving electronic processes. Every body able to browse, order and pay what they need by using small smartphone. The need for increasing data has led to a popular term with the term big data. Arguably, There are several ways big data [1] can be used to enhance a business, such as: 1) Saving money by leveraging big data technologies, 2) Making routine business decisions faster, 3) Supporting new types of decisions, and 4) Developing new products and services. Those business strategies were built around big data from the beginning, Fig. 1.

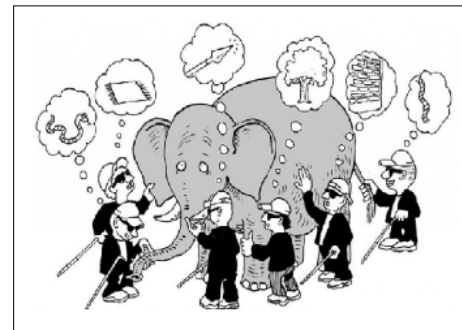


Fig. 1. An illustration of big data concept

Big data is considered a strategic technology which is perceived as a source of competitive advantage for various businesses [2]. Big data concerns large volume, complex, growing data sets with multiple, autonomous sources [3]. The basic model of big data is HACE theorem. Big Data [4] starts with large volume, **H**eterogeneous, **A**utonomous sources with distributed and decentralized control, and seeks to explore **C**omplex and **E**volving relationships among data (see Fig. 1). The consequence of big data is the need of very large storage media. Big companies have no difficulty in meeting the need for such huge storage media. For small and medium enterprise (SME), the ability to provide massive storage media is a very difficult thing.

In the current digital era, the need for services for many SME companies can be overcome by involving the paradigm of computing services in the form of cloud computing.

Cloud Computing is a paradigm in which information is permanently stored in servers on the Internet and temporarily stored on the user's computer (client) including the desktop [5]. Three most popular cloud paradigms include: 1) Infrastructure as a Service (IaaS), 2) Platform as a Service (PaaS), and 3) Software as a Service (SaaS) [6]. Cloud computing provides an environment for small to medium sized businesses to implement big data technology [7]. With cloud technology, internet users from individuals, communities to companies can use applications without having to install on a local computer, access their personal files on any computer, anytime via internet access [5]. One example of Cloud computing topology is shown in Fig. 2.

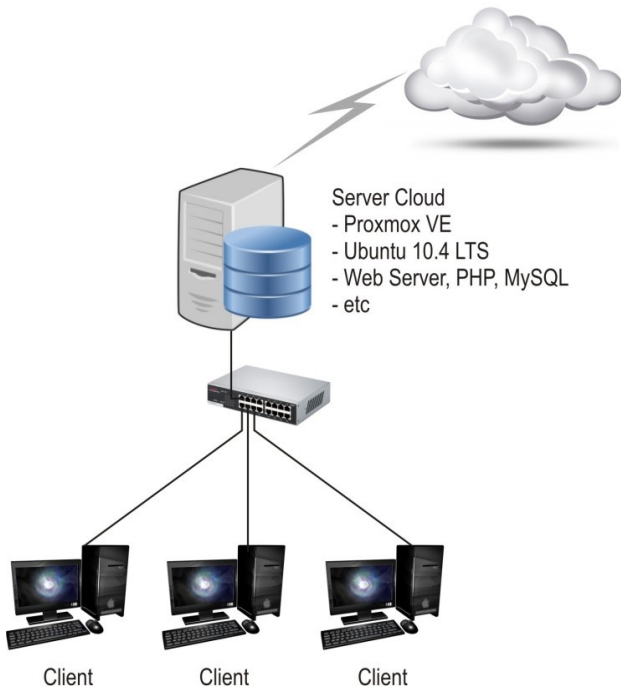


Fig. 2. An example of cloud computing concept

Along with the trend of information communication technology that involving smartphones, the cloud computing was much in touch with the smart mobile device. Mobile cloud computing (MCC) as the set of techniques that use cloud resources to empower mobile applications [8]. Figure 3 shows the architecture of mobile cloud computing.

One of the most popular famous trend in digital market is technology-based startup or cloud computing services in the field of e-commerce in Indonesia. Internet and smartphone have changed the behavior of people in shopping. At the moment there are many booming startup, Fig. 3.

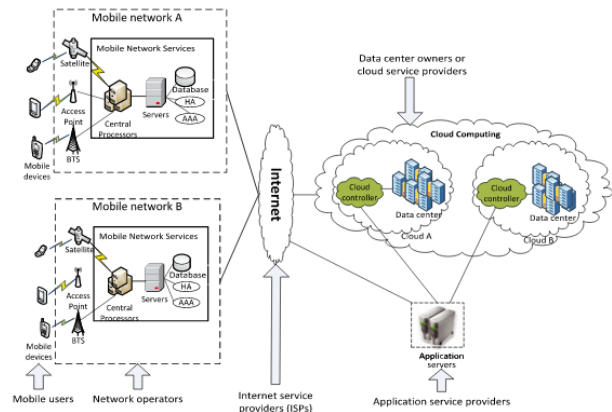


Fig. 3. Mobile cloud computing architecture.

This article describes the overview of cloud computing based companies in 3 (three) sectors: 1) Online Shopping Mall, 2) Online Transportation, and 3) Online Travel Agent.

The rest of this article are consist of 4 (four) more sections. Section 2 (two) describes online mall. Section 3 (three) describe online transportation. Section 4 (four) describes online travel agent. Last but not least is section 4 (four), conclusion. Section of conclusion summarize the article in a brief paragraph.

II. ONLINE SHOPPING MALL

Modern shopping places no longer have to be physical places. Information technology has opened a place of virtual sale. In the digital market method now, the transaction is done online, so it is known as online shopping term, Table I.

TABLE I. ONLINE SHOPPING MALL

No	Name	Logo
1	TokoPedia	
2	Lazada	
3	OLX	

The online shopping mall was showing incredible year-over-year growth and gaining traction in the countries of Indonesia, Malaysia, and Singapore [9]. Online shopping provides trading and transaction facilities supported by banking, by involving transactions through online payment via bank, it can increase the level of convenience and ease in making payments.

Indonesian ecommerce is one of the most talked about spaces in Southeast Asia’s tech startup world [10]. This section involves 3 (three) cloud computing services (online shopping sites) in the field of e-commerce in Indonesia, such as: 1) TokoPedia, 2) Bukalapak, and 3) OLX. Table 1 shows some of popular online shopping malls in Indonesia.

A. TokoPedia

Tokopedia is one of the biggest online mall in Indonesia.

Tokopedia provides a means of selling from customer to customer where anyone can open an online store that serves potential buyers from all over Indonesia. Tokopedia was founded in 2009 and has a staff of over 200 [11]. In a research [12], Tokopedia.com’s respondents that are more likely to buy fashion product category. Today, tokopedia has become an online store for everyone who wants to open a virtual business, Fig. 4.

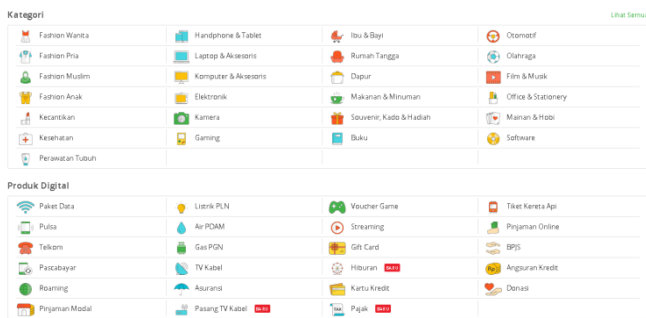


Fig. 4. TokoPedia categories and digital products

Nowadays, Tokopedia provides not less than 19 categories and 17 types of digital products (see Fig. 4). Tokopedia also famous in mobile commerce application.

Tokopedia, Indonesia’s largest marketplace, is the first digital market in ASEAN region that secure US\$100 million injection [13] from Softbank (Japanese telecommunications and internet service company), Sequoia Capital (American venture capital firm, an early investor in technology giants like Apple, Google, Yahoo and Oracle) [14] and SB Pan Asia [13].

B. Bukalapak

Bukalapak is one of the leading online marketplace in Indonesia. Just as a buying and selling service site provides a means of buying and selling from consumers to consumers (consumers to consumers business model). Anyone can open an online store in Bukalapak and serve buyers from all over Indonesia for many or many unit transactions. Bukalapak founded by Achmad Zaky in 2010 has experienced significant growth. Bukalapak has mission of promoting SMEs - SME (Small and Medium Enterprises) in Indonesia and become the market place number one choice of Indonesian society [15].

Bukalapak has a high commitment to promote SMEs. By online promotion, SMEs can meet the demand of the buyers [16] that always changing according to the demographic characteristics of the buyers. At this time Bukalapak provide at least 20 (twenty) categories of products that can be accessed via general smartphone.

C. OLX

The site began back in 2003 as TokoBagus. Online stores are required to develop various strategies to survive in online stores industry due to increasing competition [17]. In 2014, it changed its name to OLX Indonesia, and later it merged with competitor Berniaga [10]. And now, OLX is the largest online classifieds “iklan baris” site in Indonesia.

III. ONLINE TRANSPORTATION

The second technology based business is transportation sector. There are 3 (three) famous smartphone-based applications in online transportations: 1) Go-Jek, 2) Grab, and 3) Uber. Table II shows some of top online transportation services in Indonesia.

TABLE II. ONLINE TRANSPORTATION SERVICES

No	Name	Logo
1	Go-Jek	
2	Grab	
3	Uber	

A. Go-Jek

Go-Jek is the most popular online transportation services in Indonesia [18]. Go-Jek has a very handy menu section for go-jek users like: “go-ride”, “go-send”, “go-mart”, “go-food”, “go-box”, “goclean”, “go-glam”, “go-massage”, “go-busway”, and “go-tix” [19]. Go-Jek offers innovative means of transportation that provide security for its customers [20], and easy to use by every body.

B. Grab

Grab is an online transport service, it was established in Malaysia in 2012. Grab has a promo to bind its customers, such

as getting a discount when top-up balance in such a high amount balance [21]. As one of Asia’s most successful start-ups [22], grab provides any services including: 1) GrabTaxi, 2) GrabCar, 3) GrabShare, 4) GrabBike, 5) GrabExpress, 6) GrabFood, 7) GrabHitch Bike, 8) GrabHitch Car, and 9) GrabRental, Fig. 5.

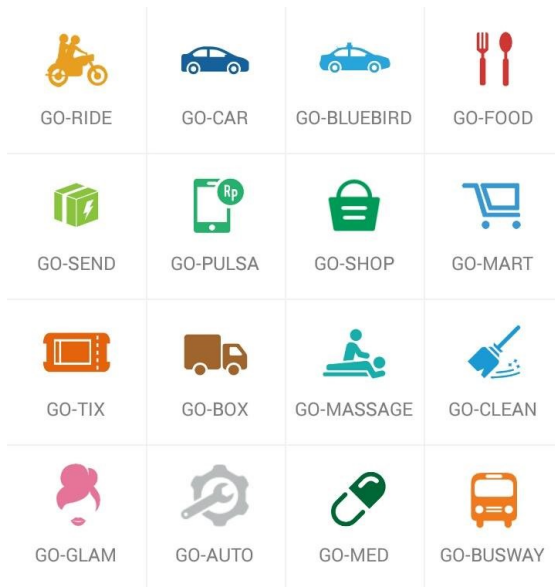


Fig. 5. Gojek services on Android app

C. Uber

Uber begins with the sharing of assets in the form of a car vehicle. Colloquially known as “ridesharing” [23]. Information technology facilitate transactions between vehicle owners and people who would like to use those vehicles for short periods of time [24].

IV. ONLINE TRAVEL AGENT

The last sector of technology based business cover in this article is online travel agent also known as OTA. There are 3 (three) famous application in online travel agents: 1) Traveloka, 2) Tiket, and 3) Pegi-peg. See Table III for the icons of those OTA.

TABLE III. ONLINE TRAVEL AGENTS

No	Name	Logo
1	Traveloka	
2	Tiket	
3	Pegi-peg	

A. Traveloka

Traveloka is one of online travel agent that is most widely used by millennium generation with the percentage of 84% [25]. This top of mind OTA offers benefits [26] to make it easier to choose the mode of transport, booking information, and a variety of tourist destinations.

Traveloka, which was originally launched as an airline ticket search site, has grown with a number of new services such as: Flight Tickets, Hotels, Train, Flight + Hotel, Top-up & Data, Attractions & Activities, Fig. 6.

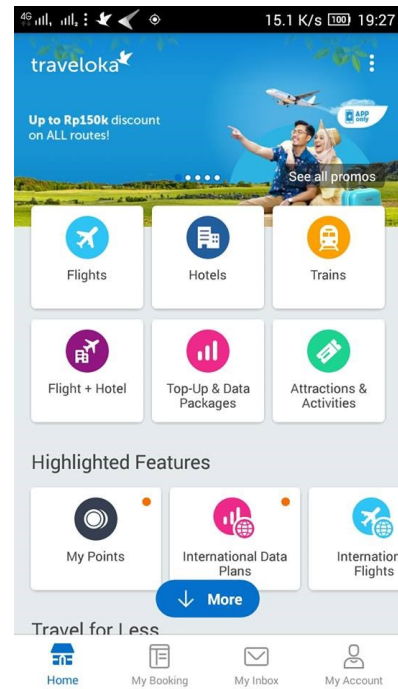


Fig. 6. Traveloka services on Android app

B. Tiket

One of the main activities in tourism is visiting places of interest. tourist destinations are often far away and require special modes to reach them. one of the popular online applications in the provision of tickets is Tiket.com.

Tiket.com is one of the largest ticket providers in Indonesia. Tiket.com provides APIs for mashup application. Mashup [27] is a web page or an application that combines a variety of online data and display it into a new form of information. This API can be accessed by developers to access and process services owned by Tiket.com. With the API, then other applications can sell tickets from Tiket.com to its customers.

C. Pegi-peg

Pegi-peg.com is one OTA based in Indonesia and serves customers directly or Business to Customer (B2C). The implementation of B2C e-commerce has increased the market sale and for long term of company development [28]. Pegi-peg.com is one of the ongoing online hotel booking websites. Pegi-peg as one of local online intermediary industry

player [29] compete to get most local and international travelers.

V. CONCLUSIONS

Big data and cloud computing has been proved to have a significant role in supporting the development of the business world. Through cloud computing, the cost of IT for many company's business are reduced significantly. Cloud computing technology open new challenges for business in many sectors (market places, transportation, travel agent, etc.). Cloud computing adoption by SME's e-commerce [30] will make significant changes in the business enterprises. All cloud computing-based businesses can be accessed using smartphones, both based on the iPhone and Android. Furthermore, all current modern marketplaces businesses have access to the most popular social media like facebook [31]. Combination of cloud computing, big data and social technologies [32] have been reached millions of people around the world.

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