

## **The Use of Cloud-based Knowledge Management in E-Marketplace**

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### **ABSTRACT**

Recent rapid growth of online business in Indonesia has encouraged companies to embrace knowledge management system (KMS) that enables them to deliver better services to their sellers and customers. The article examines one of most popular e-marketplace provider, Tokopedia, that helps millions of internet users. E-marketplace is defined as an electronic place that links sellers and buyers. It analysed the use of Amazon Web Service (AWS) as an essential component of KMS to manage people's interactions and flow of information within Seller Centre (SC) department. The SC department is a strategic business division of Tokopedia, with main objective to promote sales, store image and managing needs of customers. The outcome of the study will provide insights into how the cloud-based KMS is used by e-marketplace provider.

*Keywords:* Amazon Web Service (AWS), cloud computing, e-marketplace, Knowledge Management System (KMS), Seller Centre (SC)

### **INTRODUCTION**

Knowledge management (KM) has been used widely in major industries and has delivered tremendous benefits for companies (Alavi & Leidner, 2001). In the era of knowledge, practitioners consider the use of IT to support the application of KM known as KM system (KMS) (Trusculescu, Draghici, Ivascu, & others, 2016). Many applications have been developed to support KMS, such as social media application, video / teleconference, corporate directories,

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e-mail, e-learning, and other potential repositories tools (Storey, Treude, van Deursen, & Cheng, 2010).

Scholars have discussed the use of KMS to break down barriers by presenting information to each level and unit within the company, and to boost effectiveness of the company (Bordeianu, 2015). The vital function of KMS is to manage knowledge creation through people's interactions either physically or virtually. When developing KMS, companies should pay attention to social factors, such as people's interaction and technological aspects (Wallin & Von Krogh, 2010). The article looks at case study of cloud-based KM implementation in one of most popular e-marketplace providers in Indonesia, known as Tokopedia. Tokopedia was founded in 2009, and serves more than 12 million active customers every day. Every year, approximately 400 million products are sold, with total sales transaction exceeding US\$1 billion. The article examines the strategic business unit of Tokopedia, namely Seller Centre (SC). The SC's main tasks are to manage and link customers with the sellers. The study presents insights into the use of Cloud-based KMS application by e-marketplace provider.

## LITERATURE REVIEW

### Knowledge Management (KM)

Sveiby and Simon (2002) stated the role of KM is to create value through increasing intangible assets. Two important components in KM were examined such as: (1) managing

people interaction, related to collaboration on the network; (2) managing knowledge/information, relates to accessibility, searching, validating, taxonomy, up-to-date, knowledge flooding, managing IT related to information/knowledge security, speed, and reliability. Jabbary, Tosanloo, Shima and Zahra (2016) explained the basic issues of KM were related to creation, sharing and use of knowledge resources via e-learning application. The e-learning application in the KM process facilitates the success and growth of the company. This interaction is known as knowledge conversion.

Nonaka and Takeuchi (2008) summarised the four modes of knowledge transformation: (1) tacit-to-tacit knowledge (Socialisation). It involves sharing experience that creates tacit knowledge; (2) tacit-to-explicit knowledge (Externalisation). It involves codifying knowledge into explicit documentation; (3) explicit-to-explicit (Combination): It involves the incorporation of different objects from different explicit knowledge sources; (4) explicit-to-tacit knowledge (Internalisation). It involves absorbing documented knowledge into tacit knowledge.

According to Hedlund, the knowledge format can be applied as several level of expressions shown in Table 1 (Hedlund, 1994): (1) individual; (2) group; and (3) organisation. The KM integration in Tokopedia's SC department enables managing interaction activities among sellers, and customers.

Table 1  
*Typology and form of knowledge conversion*

Form of organisational knowledge	Levels of expression of organisational behaviour		
	Individual	Group	Organisation
Knowledge	<ul style="list-style-type: none"> <li>Professional qualifications</li> </ul>	<ul style="list-style-type: none"> <li>Common projects</li> </ul>	<ul style="list-style-type: none"> <li>Organisational structure</li> </ul>
Explicit knowledge	<ul style="list-style-type: none"> <li>Permanent memories</li> <li>Manuals etc.</li> </ul>	<ul style="list-style-type: none"> <li>Rules of cooperation</li> <li>Group norms</li> </ul>	<ul style="list-style-type: none"> <li>Rules and work procedures</li> <li>Collections of information and knowledge</li> <li>Inventions, innovations, patents</li> </ul>
Tacit knowledge	<ul style="list-style-type: none"> <li>Personal experiences</li> <li>Informal learning</li> <li>Imagination</li> <li>Talent</li> </ul>	<ul style="list-style-type: none"> <li>Joint representations</li> <li>Cognitive maps</li> <li>“Group spirit”</li> </ul>	<ul style="list-style-type: none"> <li>Organisational cultural values</li> <li>“Group spirit”</li> <li>Ethics of decisions “know-how”</li> </ul>

Source: Hedlund, 1994

### Knowledge Management Practices in Company

The KM promotes people’s interaction in the community (Masa’deh et al., 2017), and has proven to be an effective entity where they are enable to create knowledge and influence perception in the company (Scarso & Bolisani, 2008). Young (2010) addressed community interaction within a company to ensure a thriving KM. Community of Interest (CoI), Community of practices (CoP), Share Learning (SL), Project Retrospective (PR), and Peer Assist (PA). In addition, companies can implement a repository (storage) of knowledge to support the interaction of such activities. Table 2 below explains the interaction of activities among the community.

Table 2 shows each activity in the community has different benefits and characteristics. Community of interest (CoI)

has become the best method for companies in getting ideas from the public. Tokopedia provides value opportunity for new sellers to learn from top sellers in SC media. The SC media needs to understand the benefits and values of each community activity and decides on the best activities they can develop for their KM. The concept of community activity is relevant to the SECI model of Nonaka (2008) that emphasises the interaction of people and how knowledge can be made and centred in different activities.

Nowadays with the support of technology, activities can be done through a virtual world known as virtual community (Storey et al., 2010). The virtual community comprises many people, who are connected to each other on the internet and there is an exchange of views on certain subject matter. Virtual communities need IT support

Table 2  
*KM practices in organisation (Young, 2010)*

KM Practices	Definition
Knowledge Repository	A knowledge repository is a computerised system that systematically captures, organises and categorises an organisation's knowledge. The repository can be searched and data can be quickly retrieved.
Expert Locator	Expert locator is an IT tool to enable effective and efficient use and/or share of existing knowledge by connecting people who need particular knowledge with people who own the knowledge.
Community of Interest	Communities of interest (COIs) are groups of people (e.g., committees, working groups or technical sub-committees) who authoritatively represent their respective domains.
Peer Assists	A Peer Assist transfers of knowledge before doing high impact repeatable events of high risk activity.
Shared Learning	Shared Learning/ During Action Review (DAR) is a simple method for employee or team to learn during an event or project.
Project Retrospectives	Project Retrospectives/An After-Action Review (AAR) is simple method to learning immediately after one project is complete.
Community of Practices	A group of people who share a concern, a set of problems of a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basic.

to share information, communications and cross-enterprise resource sharing (Jabbary et al., 2016).

There are some implementation challenges such as: (1) communication between community members should be improved to reduce geographical and cultural gap; (2) effective knowledge sharing must be activated. A structured knowledge base is essential in collecting general knowledge; (3) management of community should be simplified. The purpose of the virtual community is about managing communication and collaboration (Thomas & Thomas, 2012). Social media has evolved as an important learning process because it allows asynchronous while timely involvement in the (open) learning process (Thomas & Thomas, 2012). In addition, social media allows ‘conversation’ about

knowledge management (Wagner, 2004) in a distributed setting where knowledge resides among multiple users. Scholars acknowledge that social media is an important driver of knowledge creation, sharing, capturing knowledge, and its use is also increasing. However, the fundamental question is about the nature and value of corporate knowledge (Von Krogh, Nonaka, & Rechsteiner, 2012).

Young (2010) defines KMS as a mechanism to manage corporate knowledge. Stary (2016) examined KMS as a system to improve organisational performance by improving employees’ decision making skills using knowledge in their daily work activities. According to the two authors, two important factors in KMS were: (1) KMS should have the ability to connect people to support them to interact in the

community, communicate between them and collaborate; (2) The KMS role is to manage information/knowledge to help people reuse

knowledge and make better decisions with their knowledge (Figure 1) (Von Krogh et al., 2012).

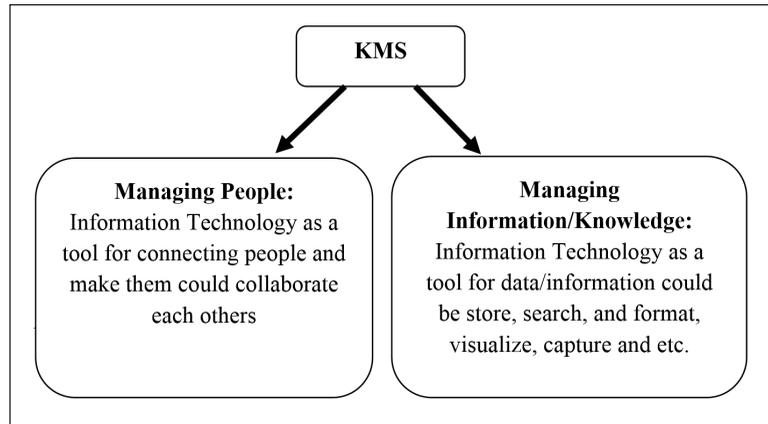


Figure 1: Knowledge Management System (KMS)

Tokopedia utilises KMS through Amazon Web Service (AWS). The database services are provided by Amazon Web Services, such as (1) Amazon relational database service (RDS), a database server service where data and servers will be in the cloud to ensure connection quality, speed, security and reliability. The AWS enables connection with several DBMS, such as MySQL, Oracle and SQL Server; (2) Amazon DynamoDB, is a NoSQL database server service that provides high connection quality, speed, security and easy setup and configuration. This service provides ease of scalability that enables data to grow and shrink as needed; (3) Amazon SimpleDB, is a NoSQL database server service like Amazon DynamoDB, but smaller; (4) Amazon Elastic Cache, is a memory cache sitting on top of the cloud. By using this service, we can improve the performance of

web applications through storing the cache over the cloud and not burdening the web server application.

With the technology provided by Amazon, Tokopedia's SC can develop relative robust access, since it has to service millions of users each day. According to Debowski (2005), KMS comprised: (1) business process management (BPM), directs and sharpens the development of KMS by developing company strategy for KM. It is directly affects KMS and its other aspects that determine access to certain knowledge, how to support access to knowledge, and determine the knowledge that has high priority; (2) content management system (CMS), ensures effective content and document management so that KMS effectively connects end users with many sources of intellectual content, both within and outside the company

(figure 2); (3) web content management system (WCMS), operates KMS platform. At the basic level, it provides technological capacity to connect KMS with users and other sources of knowledge inside and outside the company. The presence of servers, interfaces, and KMS portals that support WCMS; (4) knowledge applications management (KAM), provides user knowledge tools that enables to improve ease and effectiveness. Its main function is to facilitate the formation of knowledge, collaboration, and communication. The effectiveness of KMS depends on the capacity of users in creating new knowledge and managing workflows using existing technology and knowledge management applications that support this.

Debowski (2006) further examined the successful implementation of KMS, such as (1) the system should reflect and was responsive to the needs of the company; (2) the system reflected the principles of KM, particularly the impetus for collaboration and communication; (3) the system reflected a deep concern for the individual throughout the development phase. Tokopedia SC provides facilities that make it easy for all users to sell products only by uploading photos and writing product descriptions. Buyers are also given a complete product browsing system in a variety of search options. Tokopedia provides complete information about the seller so that buyers can compare and choose suitable vendor. Tokopedia also provides a marketplace for all sellers with no cost. Now Tokopedia has millions of stores registered in Tokopedia.

## MATERIALS AND METHODS

### KMS Formulation

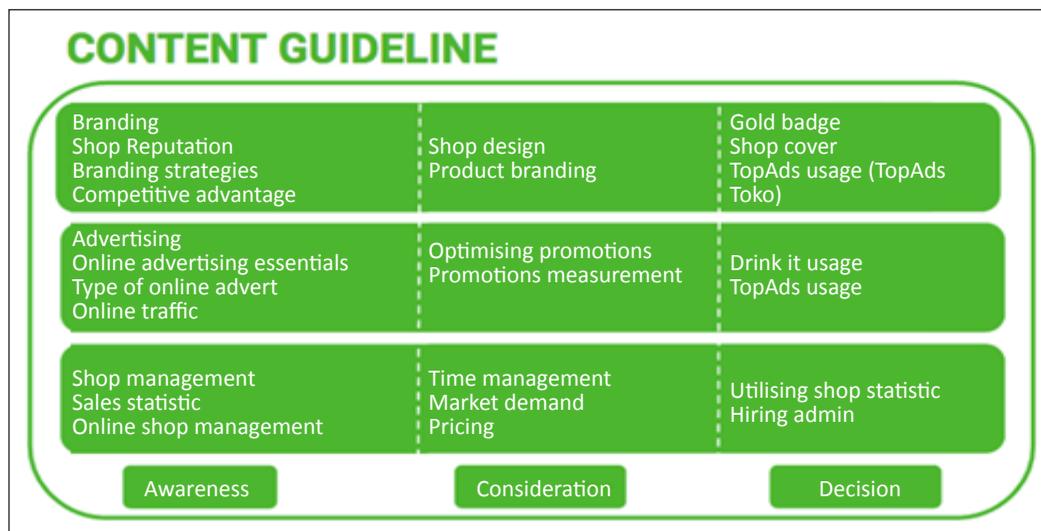


Figure 2. Content guideline

The paper had examined the KMS formulation within SC. Currently, thousands of sellers are applying to Tokopedia every day. The TKP Seller Centre has challenges to disseminate knowledge about sellers in Tokopedia, such as promoting new features, to establish networks with local seller in the region. The SC has 5 missions to focus in its development such as: (1) integrating seller education channel; (2) developing a seamless seller education

course; (3) increasing seller's interest in using paid Merchant Gold features; (4) increasing inbound marketing (acquisition & retention); (5) providing source of information for online customers. Figure 3 shows content categorisation applied in the SC. There are 3 stages that every seller needs to go through: creating awareness, assessment, and making decision. Each stage is different in terms of branding, advertising, and shop management.

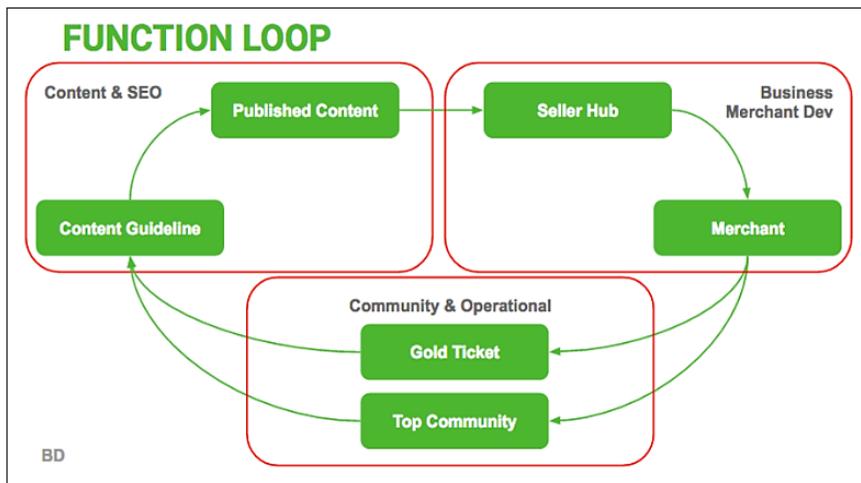


Figure 3. Function loop in Seller Centre (SC)

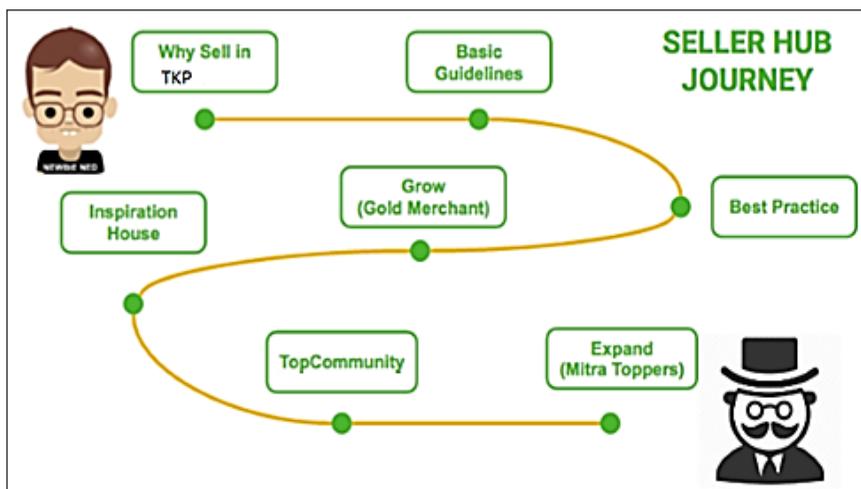


Figure 4. Seven stages to be expert seller

Figure 3 shows Tokopedia has 7 tips to become expert seller (see Fig.4): (1) why selling at Tokopedia; (2) basic guidance on how to sell; (3) best practice tips that have been done by top sellers; (4) preparation development by using Gold Merchant features; (5) inspiration for sellers who needs sharing and discussion; (6) joining top

community in the area; (7) provide capital loan and technical assistance as a strategic partner.

Figure 4 shows the relationship of the three functions involved in the development of SC. The content of each stage is summarised in Figure 5.



Figure 5. Content in each seller stage (seller hub journey)

Tokopedia appreciates the interaction mechanisms among sellers to provide valuable ideas for feature development that enables them to sell easily (Valdez-Juárez, L. E., García-Pérez de Lema, D., & Maldonado-Guzmán, G., 2016). Sellers can access sharing information through <http://seller.Tokopedia.com>. Here are some views of sellers in Tokopedia (see Figure 6).

Tokopedia SC is managed by a knowledge manager and assisted by a team of knowledge engineers. The role of

knowledge engineer is to monitor, codify, assimilate, and distribute knowledge created through interaction mechanisms by sellers, buyers, internal staff, and other third parties.

In serving sellers, customers and industries, the complexity of knowledge also increased dramatically. All staff are expected to develop into fast learners and adopt advance knowledge management framework to cater to unique needs of their customers.

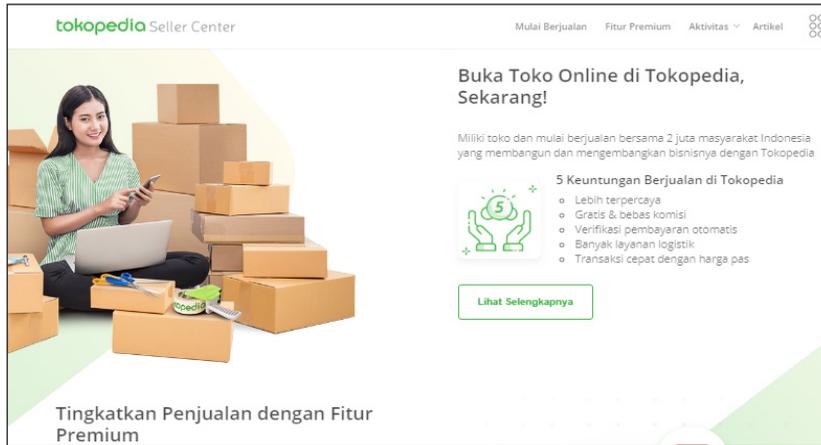


Figure 6. Front page of Seller Centre (SC) support



Figure 7. Knowledge sharing article

### Existing Problem

Tokopedia has placed high priority on its customer base, especially in vendor training. However, many problems prevail, such as: (1) lack of training; (2) training facility for all vendors in all places; (3) gold programme that is yet to be utilised. The SC department is given a mandate to provide easy access and information that: (1) enable integration and monitoring vendor achievements; (2) promoting Gold Merchant programme to all vendors; (3) having creative features to boost image of the store.

### RESULTS AND DISCUSSION

Data from Google Analytics from 1<sup>st</sup> July – 30<sup>th</sup> September 2017, is summarised in Figure 8.

Managing knowledge in SC is not an easy task, since there are thousands of sellers with different industry background wanting to Tokopedia seller. They have different interests and may be carrying unique style of selling or serving their customers. As a huge e-marketplace, SC should develop necessary competence and information system that to cater to these unique needs of sellers and industries/customers.

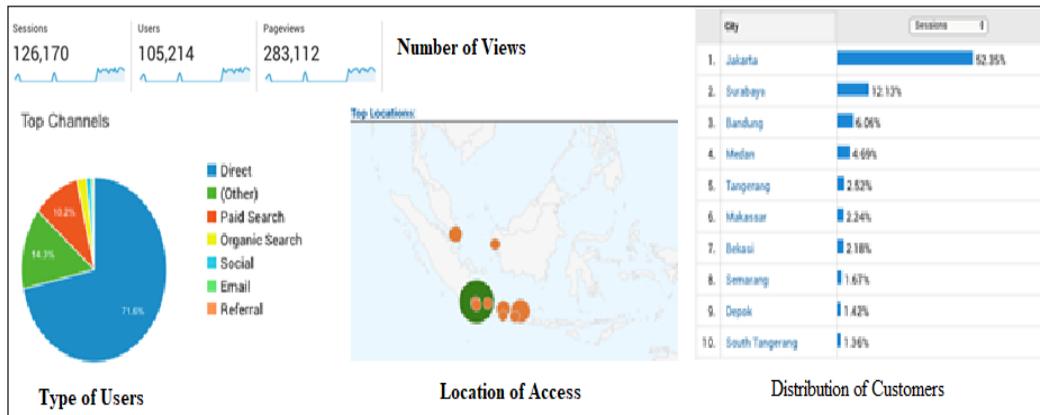


Figure 8. Results of Google Analytics

## CONCLUSION

The KMS is very useful for all sellers in Tokopedia whereby SC is a good implementation in equity of knowledge on how to be a good seller in Tokopedia. Tokopedia needs to pay attention to social and technological aspects in developing and implementing KMS at SC. In general, KMS has two functions: managing people interaction and managing knowledge / information. Tokopedia must maintain the interaction within Top Community as a source of practical knowledge from seller-seller to collect its knowledge for other sellers. The use of Amazon Web Service boosts the confidence of Tokopedia when SC is used by millions of users. Implementation of KM becomes very important for the company and SC plays a key role to realise that goal.

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