

QR Code as a Knowledge Management Tools

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Abstract—Managing knowledge possessed by an organization becomes a necessity. Organizations that can manage their knowledge will be able to compete with other organizations. Knowledge management is a method that is suitable for organizations in managing their knowledge. Knowledge sharing is an important part of the concept of knowledge management. QR Code as a technology can be used as a medium to share knowledge quickly and easily. The advantages of the QR Code are in line with technological developments that tend to be mobile based. The QR Code is a two-dimensional barcode arranged in a matrix. With this concept, data and information can be stored more in a QR Code compared to one-dimensional barcodes that can only store data in one line.

Keywords; *QR Code; Knowledge Management; Knowledge Sharing*

I. INTRODUCTION

Managing knowledge possessed by an organization becomes a necessity. Organizations that can manage their knowledge will be able to compete with other organizations. Knowledge management is a method that is suitable for organizations in managing their knowledge. Knowledge sharing is an important part of the concept of knowledge management. Knowledge is a very valuable asset for the company. The more knowledge that Stakeholders have from a company, the more advanced the company will become. Knowledge Management can help companies to share knowledge about business processes, problems that occur in each work unit, to share experiences about things outside of work that are useful for developing knowledge from company employees. When viewed from its definition, Knowledge Management is a process that assists organizations in identifying, selecting, organizing, disseminating, and transferring important information and experiences that are part of the organization [1]. In organizations, knowledge becomes one Strategic resources that are important especially in conditions fast-changing environment [2].

Knowledge sharing can help companies to do business processes, problems happens to every work unit, to sharing experiences about things outside of work that are beneficial to knowledge development from company employees. A process that helps organizations identify, select, organize, disseminate, and transfer important information and experiences that are part of the organization [1]. Knowledge sharing is one method or one of the steps in the knowledge management used to provide

opportunity for members of a group share technical knowledge, experiences, ideas they have with others.

QR codes were first used in 1994 by Denso Wave, a Toyota subsidiary company in Japan. QR codes Provided a fast and convenient approach to track vehicles through manufacturing process at automotive sector. QR Code as a technology can be used as a medium to share knowledge quickly and easily. The advantages of the QR Code are in line with technological developments that tend to be mobile based. One of the most significant areas of mobile telephones is their own ability to access the Internet anywhere, making it feasible to reach the info at any moment that they want. QR codes are used in a diverse assortment of places like networking, street banners, all of areas resulting in web sites, audio, video and social networks [3].

II. TERMINOLOGY

A. Knowledge Management

Knowledge management (knowledge management) is a series of activities used by organizations or companies to identify, create, explain, and distribute knowledge to be reused, known, and learned within the organization. These activities are usually related to organizational objectives and are intended to achieve certain outcomes such as shared knowledge, improved performance, competitive advantage, or a higher level of innovation.

The concept of knowledge management includes the management of human resources (HR) and information technology (IT) in order to achieve better corporate organization so as to win business competition. The development of information technology does play an important role in the concept of knowledge management. Almost all activities of human life will be colored by the mastery of information technology, so that if talking about management knowledge can not be separated from management.

Knowledge creation is the development of new ideas through explicit and tacit knowledge [4]. Knowledge creation helps companies improve management processes, identify new opportunities and support innovation to grow [5]. Interaction through a process of creation or knowledge conversion is called SECI (socialization, externalization, combination and internalization) [6] as shown in Figure 1.

According to Nonaka, Knowledge can be categorized into two categories, Tacit and Explicit knowledge. Basically, tacit

knowledge is personal, developed through experiences that are difficult to formulate and communicate [7]. Tacit knowledge is not expressed in writing, but something that is found in the minds of people who work in an organization.

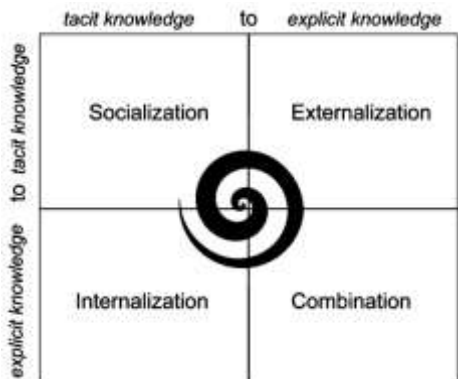


Figure 1 SECI Model

According to Polanyi [8] tacit knowledge is generally described as:

1. Understanding and application of the subconscious mind
2. Hard to pronounce
3. Developing from direct events and experiences
4. Share knowledge through conversation (story-telling)

Based on its understanding, tacit knowledge is categorized as personal knowledge or in other words knowledge gained from individuals (individuals). The experience gained by each employee certainly varies based on unpredictable situations and conditions. The definition of experience taken from the English dictionary is the process of gaining knowledge rather than through studying. Which means the process of acquiring knowledge or ability during a certain period by seeing and doing things rather than by learning.

Explicit knowledge is formal and systematic which is easy to communicate and share [7]. According to Polanyi (1966) when tacit knowledge can be controlled in one's mind, explicit knowledge must depend on tacit understanding and application, therefore all knowledge is rooted in tacit knowledge. In general, explicit knowledge can be described as:

1. Can be said correctly and officially
2. Easy to compile, document, transfer, share and communicate.

The application of explicit knowledge is easier because the knowledge obtained in the form of written or documented statements, so that each employee can learn it independently.

Technology is one of the main elements found in knowledge management, known as a medium that facilitates the spread of explicit knowledge. Knowledge management is driven by technology, especially explicit knowledge which is easier to compile. Over time, technology that supports knowledge

management will always develop in the form of systems that facilitate the process of disseminating knowledge.

Knowledge Element:

1. People

Which means Knowledge Management comes from people. People are the basic form to form new knowledge. Without anyone there will be no knowledge.

2. Processes

Which consists of capturing, filtering, presenting, transforming, and disseminating knowledge to all companies equipped with certain procedures and processes.

3. Technology

It is a technology infrastructure that is standard, consistent and reliable in supporting company tools.

B. Quick Response Code (QR Code)

QR Code stands for Quick Response code, first used in the automotive industry to track vehicle components. Currently, the use of two-dimensional barcodes is very broad, but generally used to encode website addresses, contact numbers, e-mail addresses, telephone numbers or just plain text. You can see the QR code as shown in Figure 2.



Figure 2. QR Code

The tool used to read QR Code is called the QR Code Scanner. Generally, this tool is not a separate tool, but is available in the form of applications on smartphones such as Android or iPhone. The main purpose of the QR Code is currently used to make it easier for Smartphone users to access information in two easy steps, 1. scan the QR code, 2 do the Action. the action here can be to open a browser, save contact information, or dial the number in the QR code.

A QR code is Effective at holding 7,089 Numerical Character, 4,296 alphanumeric Character, 2,953 binary bytes, 1,817 Kanji Character plus Some Mix of them.

The symbol versions of QR Code range from Version 1 to Version 40. Each version has a different module configuration or number of modules. "Module configuration" refers to the

number of modules contained in a symbol, commencing with Version 1 (21 × 21 modules) up to Version 40 (177 × 177 modules). Each higher version number comprises 4 additional modules per side. Each QR Code symbol version has the maximum data capacity according to the amount of data, character type and error correction level. In other words, as the amount of data increases, more modules are required to comprise QR Code, resulting in larger QR Code symbols.

III. DISCUSSION

QR code is still deemed a comparatively brand-new tool nevertheless gaining recognition from commercial markets thus scholarly posts of QR codes in the region of advertisements are just few. Critical participation is that of Okazaki et al. [9] who participates with different research workers and reasoned in their analysis regarding the value of rising awareness and familiarity with QR codes and thus induce its user acceptance.

Knowledge sharing is the process by which knowledge is distributed to people or work units in need. For example: the dissemination of knowledge about agriculture to farmers which includes economic, environmental and social aspects. The dissemination of this knowledge should be based on information and knowledge that can be accessed farmers to increase production, improve quality and improve the efficiency of economic activities [10].

To Organize a document embedded Using QR codes, the simplest way to do is to Create the codes Employing some of the tools available from the Web. These images can be embedded into the document at the Rig. As a tool for QR code generators, we can use the QR code generator provider available on the internet, such as <https://id.qr-code-generator.com/>. In the event the mobile device does not assemble in any QR code reader, the user should download the decoder that is perfect in the web and installs it.



Figure 3. QR Code generator

To embed the required text/SMS/URL/Contact or other data into a QR code, we can make use of some Websites as shown in figure 3 that can generate the code for us. And then the Website will generate the QR code for you as shown at figure 2. We can save the generated QR Code image file and embed it into wherever we want in the document.

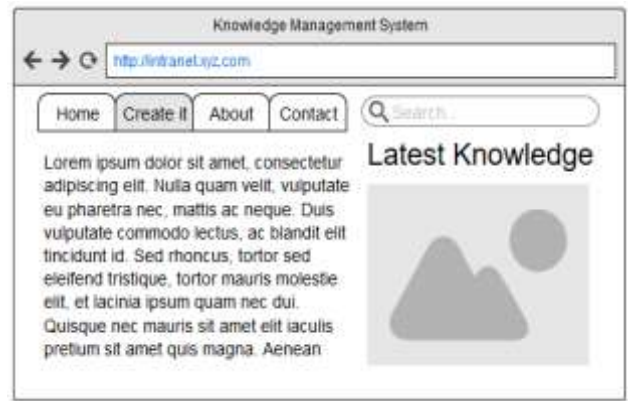


Figure 4. Knowledge Management System (KMS) Portal

In Figure 4, we can see the design for the website display for the intranet from the Knowledge Management System (KMS). All interactions of Knowledge Management activities in the organization are centered on the website. Employees can see the latest information or knowledge that has been made. Employees can also start making knowledge to share with other employees in the organization.

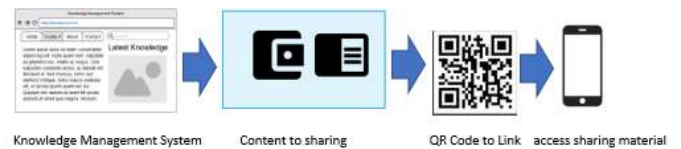


Figure 5. Step to sharing knowledge

The steps taken to share knowledge are: Employees prepare materials to share. Then enter the KMS portal to start inputting data. Before inputting the data, the material that will be shared is inputted first to the QR Code generator, for example to the qr code generator provider site which is available for free on the internet. After that a QR Code will be formed which will then be inputted again to the KMS portal. The last stage, other employees can access information from the QR Code via their mobile phones.



Figure 6. Sample of QR Code

Figure 6 is an example of knowledge sharing material that has been created, for later employees can scan it through mobile phones that have installed the QR code scanner application on their mobile phones.

CONCLUSION

The conclusion obtained after doing this research is that the QR Code can be used as an appropriate tool for sharing knowledge. Knowledge management is actually how knowledge creation can continue to roll. Every time sharing knowledge, the creation of new knowledge will be faster and faster. QR Code with all its convenience and with mobile technology that provides convenience for its users, is one of the right tools to support the implementation of knowledge management in an institution.

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