

**THE ROLES OF INFORMATION TECHNOLOGY IN  
ISLAMIC BANK KNOWLEDGE MANAGEMENT  
A study of Two Syariah Banks in Palu**

**Nurdin Nurdin**

Institut Agama Islam Negeri (IAIN) Palu

Email: nnurdin@iainpalu.ac.id

**Abstract.** Information technology has been considered as a vital tool for modern organizations to support their knowledge management projects. Previous studies have found that success knowledge management projects were supported by various information technology infrastructures. They addressed how information technology has successfully implemented to support knowledge management project within conventional banks. However, limited study has been proposed regarding how information technology play roles in support knowledge management project within Islamic banks. Through the case study approach, the author studied the use of information technology for knowledge management process within two Bank Syariah (Bank Mandiri and Bank BNI Syariah) in Palu Central Sulawesi. The author collected data through observation, written material, and in-depth interviews with key informants from both banks. The findings show that information technology infrastructures have played important roles in support knowledge management projects within the Islamic banks. Those information technology infrastructures includes internet, intranet, websites, communication application such as email, and social media. This study sheds light and provides new insight on how information technology has successfully used to support knowledge management within Islamic banks. The results benefits both academic and practioners in Islamic banks and knowledge managemet area. As the social media was an important finding for knowledge management in Islamic banks, future research need to focus on how social media should be used for knowledge management projects in Islamic banks.

**Abstrak.** Teknologi informasi telah menjadi instrument yang paling penting dalam mendukung manajemen pengetahuan dalam berbagai organisasi moderen. Penelitian sebelumnya memperlihatkan bahwa suksesnya berbagai kegiatan manajemen pengetahuan akibat adanya dukungan berbagai sarana teknologi informasi. Literature tersebut juga memperlihatkan bagaimana

teknologi informasi telah mendukung berbagai proyek manajemen pengetahuan dengan berhasil. Namun penelitian terkait bagaimana teknologi informasi berperan dalam manajemen pengetahuan dalam perbankan Islam masih sangat terbatas. Dengan menggunakan pendekatan studi kasus pada dua perbankan syariah di Palu, penelitian ini mengkaji pemanfaatan teknologi informasi dalam manajemen pengetahuan dalam perbankan syariah. Data dikumpul melalui kegiatan observasi langsung, wawancara mendalam dengan beberapa informan penting, dan juga dengan mengkaji berbagai dokumen yang relevan. Hasil penelitian ini memperlihatkan bahwa berbagai infrastruktur teknologi informasi telah berperan penting dalam mendukung berbagai aktifitas manajemen pengetahuan di kedua bank syariah tersebut. Hasil penelitian ini memberikan wawasan baru terkait bagaimana teknologi informasi berperan dalam manajemen pengetahuan dalam perbankan Islam. Hasil penting dalam penelitian ini adalah dimanfaatkannya teknologi social media sebagai salah satu sarana manajemen pengetahuan seperti untuk berkomunikasi dan membagi pengetahuan. Untuk itu, penelitian kedepan perlu mengkaji lebih mendalam terkait bagaimana pemanfaatan media sosial untuk keperluan manajemen pengetahuan di perbankan syariah.

**Kata Kunci:** Teknologi Informasi, Manajemen pengetahuan, Perbankan Syariah

## **Introduction**

Technology has become an important tool for any modern companies. The technology support a company businesses process in many aspects of operation such as administration, costumer services, data processing, and knowledge management. Companies are competing to invest latest technology to win competition in high a competitive market.

Knowledge management (KM) is one aspect of companies operation that requires technological support. Technologies enhance Knowledge Management to support the new strategies, processes, methods and techniques to better create, disseminate, share and apply the best knowledge, anytime and anyplace, across the team, across teams, across the organisation and across several

organisations, especially its clients, customers, partners, suppliers and other key stakeholders<sup>1</sup>.

Current management interests are also focused on knowledge management as a major determinant of business excellence and competitive advantage, Empirical findings suggest that management of both endogenous and exogenous knowledge through IT applications significantly enhances dynamic capabilities.<sup>2</sup>

Conventional banks have implemented technollogy in their knowledge management operation earlier compared to Islamic banks. Knowledge management is understood as a business-focused approach to the collection of processes that govern the creation, dissemination, and utilisation of knowledge to fulfil organisational objectives thereby adding value to and increasing the productivity of the organisation.<sup>3</sup> These value and productivity can be higher when information technology tools are utilized in the banks knowledge management process.

Several studies have been conducted to understand technology contribution in banking knowledge management.<sup>4, 5, 6</sup>

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<sup>1</sup> Knoco. "Knowledge Management Technology", (2008), from Knoco <http://www.knoco.com/knowledge-management-technology.htm>, Retrieved 14 November 2016.

<sup>2</sup> Sher, P. J., & Lee, V. C. (2004). Information technology as a facilitator for enhancing dynamic capabilities through knowledge management. *Information & Management*, 41(8), 933-945. doi: <http://dx.doi.org/10.1016/j.im.2003.06.004>

<sup>3</sup> Zyngier, S. The role of technology in Knowledge Management: trends in the Australian corporate environment (pp. 11), (2001), Melbourne, Australia: School of Information Management & Systems, Monash University.

<sup>4</sup> Bourini, F., Khawaldeh, K., & Al-Qudah, S. The Role of Knowledge Management in Banks Sector (Analytical Study- Jordan), *Interdisciplinary Journal of Contemporary Research in Business*, 5(3), (2013), 53-77.

Banks which utilize information technology in their operation can improve their coordination and decision making.<sup>7</sup> Such banks are also able to store their unique and critical knowledge in an advanced technology means such as online database.<sup>8</sup> Conventional banks utilize information technology as the key technologies which support communication and collaboration in knowledge management such as knowledge collection, sharing, and integration.

Instead previous studies, such as Bourini, et al.,<sup>9</sup> Cebi, Aydin, & Gozlu,<sup>10</sup> Suvarchala,<sup>11</sup> have found the effectiveness of utilization of technology in knowledge management in conventional bank sectors, limited studies have been carried out to understand how such information technology can also be implemented within Islamic bank area. This study, therefore, is intended to shed light how knowledge management within Islamic banks can be driven by information technology infrastructures to support effective and efficient business process of Islamic banks.

To address those issues, this study will answer the following research questions: What information technology (IT) and how the

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<sup>5</sup> Mohsen, Z. A., Ali, M., & Jalal, A. The Significance of Knowledge Management Systems at Financial Decision Making Process. *International Journal of Business and Management*, 6(8), (2011), 130-142.

<sup>6</sup> Nwobodo, L. O., & Inyama, H. C. Modeling a Knowledge Management System for Banking Industry. *International Journal of Engineering Research & Technology (IJERT)*, 3(6), (2014), 2092-2100.

<sup>7</sup> Mohsen, et al., The Roles of Knowledge...

<sup>8</sup> Nwobodo & Inyama, Modelling of Knowledge Management...

<sup>9</sup> Bourini, et al., The Role of Knowledge Management ...

<sup>10</sup> Cebi, F., Aydin, O. F., & Gozlu, S. Benefits of Knowledge Management in Banking. *Journal of Transnational Management*, 15(4), (2010), 308-321.

<sup>11</sup> Suvarchala, M. B. Knowledge Management in Commercial Banks : A Case Study of The State Bank of India. *International Journal in Multidisciplinary and Academic Research*, 2(3), (2011), 15.

IT plays roles in knowledge management within Islamic bank sectors?

For reminder, this paper is structured as follows: following this section, literature review is dicussed in section two. The research methology is addressed in section three. The result of this study is presented section four and followed by discussion in section five. The discussion and conclusion are presented in section sik and sevent respectively.

### **Previous Studies**

There are number seminar studies (e.g: Borghoff & Pareschi<sup>12</sup> and Sher & Lee<sup>13</sup>) have been carried out to understand technology used in an organization knowledge management. The studies were carried out in number companies such as manufacture,<sup>14</sup> corporate environment,<sup>15</sup> and banks.<sup>16</sup> Their studies found that information technology play important roles in communication, sharing, transferring, and integrating knowledge across organization level and employee groups. Within those contexts, IT has been considered as an effective tool to improve organizations' effectiveness in Knowledge Management process.<sup>17</sup>

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<sup>12</sup> Borghoff, U. M., & Pareschi, R.. *Information Technology for Knowledge Management* (Berlin: Springer, 1998).

<sup>13</sup> Sher, P. J., & Lee, Information technology...

<sup>14</sup> *Ibid*

<sup>15</sup> Zyngier, S, The role of technology...

<sup>16</sup> Bourini, et al., The Role of Knowledge Management...

<sup>17</sup> Subashini, R., Rita, S., & Vivek, M. The Role of ICTs in Knowledge Management (KM) for Organizational Effectiveness. In P. V. Krishna, M. R. Babu & E. Ariwa (Eds.), *Global Trends in Information Systems and Software Applications: 4th International Conference, ObCom 2011, Vellore, TN, India, December 9-11, 2011. Proceedings, Part II* (pp. 542-549), Berlin, Heidelberg: Springer Berlin Heidelberg, 2012).

For example, Chugh et al.,<sup>18</sup> found that technology support is necessary for KM in an organization. KM projects are likely to succeed when an information technology infrastructure is adopted and used. IT infrastructure includes intranet, e-mail, document management, data warehousing, workflow software, and decision support system. Duffy<sup>19</sup> considers IT as an effective tool in managing, storing and accessing documents and databases within a KM project. However, Duffy<sup>20</sup> suggests IT professionals should be well aware about the various knowledge management processes to succeed the project. When the IT becomes a major player for KM process within companies, the IT can be functioned as the pillars of KM along with other pillars of organization, leadership, and learning<sup>21</sup>.

Information technology for knowledge management also has been found to reduce loss of critical information and improves data retrieval because the knowledge can be stored in a centralized information technology storage.<sup>22</sup> The storage retains critical the workers' knowledge across organization levels. The IT, then, retrieve the knowledge for assimilation and presentation for re-use with organization.

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<sup>18</sup> Chugh, M., Chugh, N., Punia, D. K., & Agarwal, A. (2013). *The Role of Information Technology in Knowledge Management* Paper presented at the Conference on Advances in Communication and Control Systems 2013 (CAC2S 2013).

<sup>19</sup> Duffy, J. "Something funny is happening on the way to knowledge management", *Information Management Journal*, Vol. 34 No. 4, pp. 64-8. . *Information Management Journal*, 34(4), (2000), P. 64-68.

<sup>20</sup> *Ibid*, P.65

<sup>21</sup> Stankosky, M. A., & Baldanza, C. *Knowledge Management: An Evolutionary Architecture toward Enterprise Engineering* Paper presented at the International Council on Systems Engineering (INCOSE), Reston, VA.

<sup>22</sup> Ray, L. Requirement for knowledge management: business driving information technology. *Journal of Knowledge Management*, 12(3), (2000), pp. 156-168.

Meanwhile, a study from Mohammed, Stankosky, dan Murray<sup>23</sup> found that the use of IT for Knowledge Management is able to support the contextualization of tacit knowledge. The IT tool facilitates knowledge codification and contextualization through activities such as storing, transferring and sharing. This can be carried out through the use of applications that support some behavioral context and human cognitive dimensions.

Previous studies (e.g: Huang, Quddus, Rowe, & Lai<sup>24</sup>) also found that that the use of technology in knowledge management improved their work performance. The higher level employees were able to generate creative and innovative ideas to produce new insurance products and new marketing strategies. They accessed storage knowledge in the company data based using information technology instruments. The study was carried out tthrough in-depth interviews which involved 10 higher level employees within an insurance company.

Within Islamic banks context, studies on the use of IT for knowledge management have been conducted overseas such as in Pakistan (e.g: Abuazoum, Azizan, & Ahmad<sup>25</sup> ) and United Arab Emirates (e.g: Cader et al.,<sup>26</sup>), and Nigeria (e.g: Bello &

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<sup>23</sup> Mohamed, M., Stankosky, M., & Murray, A. Knowledge management and information technology: can they work in perfect harmony? *Journal of Knowledge Management*, 10(3), (2006), pp. 103-116.

<sup>24</sup> Huang, L.-S., Quaddus, M., Rowe, L. A., & Lai, C.-P. An investigation into the factors affecting knowledge management adoption and practice in the life insurance business. [journal article]. *Knowledge Management Research & Practice*, 9(1), (2011), pp. 58-72.

<sup>25</sup> Abuazoum, A. A. A., Azizan, N., & Ahmad, N. Knowledge Sharing for the Islamic Banking Sector in Malaysia. *International Journal of Computer and Communication Engineering*, 2(3), (2013), pp. 368-371.

<sup>26</sup> Cader, Y., O'Neill, K. K., Blooshi, A. A., Shouq, A. A. B. A., Fadaaq, B. H. M., & Ali, F. G. Knowledge management in Islamic and conventional banks in the United Arab Emirates. *Management Research Review*, 36(4), (2013), pp.388-399.

Abubakar<sup>27</sup>). However, their studies merely focused on the use of IT for knowledge sharing, comparing knowledge management between Islamic and conventional banks, and challenge and solution for Islamic bank systems.

### **Knowledge and Information**

The term of knowledge and information are often misinterpreted and they are considered similar. In fact both of the terms are different. Synonyms for knowledge include understanding, awareness, intelligence, comprehension and wisdom. Synonyms for information include facts, news, and definition. Knowledge unlike information cannot always be transmitted in its entirety in codified form. Knowledge can grow from the interaction of individuals or groups in the sharing of prior knowledge.<sup>28</sup>

Islam uses Arabic term '*ilm*' for knowledge in Islamic theory of knowledge, but 'Knowledge' falls short of expressing all the aspects of '*ilm*'. Knowledge in the Western world means information about something, divine or corporeal, while '*ilm*' is an all-embracing term covering theory, action and education. Some Western experts define knowledge in different ways. For example, Chatterjee<sup>29</sup> says that knowledge means awareness or apprehension of objects and Davis<sup>30</sup> defines knowledge as "information organized and processed to convey understanding, experience,

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<sup>27</sup> Bello, A., & Abubakar, M. i. Challenges and Solutions to Islamic Banking System in a Pluralistic–Secular Country like Nigeria. *Mediterranean Journal of Social Sciences*, 5(6), (2014), pp. 25-34.

<sup>28</sup> Zyngier, S. (2001). The role of technology

<sup>29</sup> Chatterjee, S. C. *The Nyanya Theory of Knowledge*. (Calcuta University of Calcuta, 1939), p.9

<sup>30</sup> Davis, G. B. A Research Perspective for Information Systems and Example of Emerging Area of Research. *Information Systems Frontiers*, 1(3), (1999), pp. 195-203.



accumulated learning, and expertise as they apply to a problem or activity”.

In addition, Abell and Oxbrow<sup>31</sup> define knowledge as the expertise, experience, and capability of staff, integrated with processes and corporate memory. Furthermore, Nonaka<sup>32</sup> gives definition on knowledge broader than two definitions above by saying knowledge is about beliefs, commitments, action, and meaning which shows clear distinction with information.

In Islam, there is no concept that has been operative as a determinant of the Muslim civilization in all its aspects to the same extent as *'ilm*. This holds good even for the most powerful among the terms of Muslim religious life such as, for instance, *tawhīd* "recognition of the oneness of God," *ad-din*, "the true religion," and many others that are used constantly and emphatically. None of them equals *ilm* in depth of meaning and wide incidence of use. There is no branch of Muslim intellectual life, of Muslim religious and political life, and of the daily life of the average Muslim that remains untouched by the all pervasive attitude toward "knowledge" as something of supreme value for Muslim being. *'ilm* is Islam, even if the theologians have been hesitant to accept the technical correctness of this equation. The very fact of their passionate discussion of the concept attests to its fundamental importance for Islam.

It may be said that Islam is the path of "knowledge." No other religion or ideology has so much emphasized the importance of *'ilm*. In the Qur'an the word *'alim* has occurred in 140 places, while *al-'ilm* in 27. In all, the total number of verses in which *'ilm* or its derivatives and associated words are used is 704. The aids of

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<sup>31</sup> Abell, A., & Oxbrow, Competing with Knowledge ...p.73

<sup>32</sup> Nonaka, I. *The Knowledge-Creating Company* (12 ed.). (New York: Harvard Business School, 2008).

knowledge such as book, pen, ink etc, amount to almost the same number. *Qalam* occurs in two places, *al-kitāb* in 230 verses, among which *al-kitāb* for Alqur'an occurs in 81 verses. Other words associated with writing occur in 319 verses.<sup>33</sup> It is important to note that pen and book are essential to the acquisition of knowledge. The Islamic revelation started with the word *iqra'* ('read!' or 'recite!'). This showed the important of acquiring knowledge for human being.

Even though Western world defines knowledge close to the meaning of information, but knowledge is more than information. It is data organized into meaningful pattern and it is also information possessed in the mind of individuals related to the facts, procedures, concepts, interpretation, ideas, observation, and judgment<sup>34</sup>. Information is transformed into knowledge when person reads, understands, interprets, and applies the information to a specific work function. Knowledge becomes visible when experienced people put into practice lessons learned overtime.<sup>35</sup>

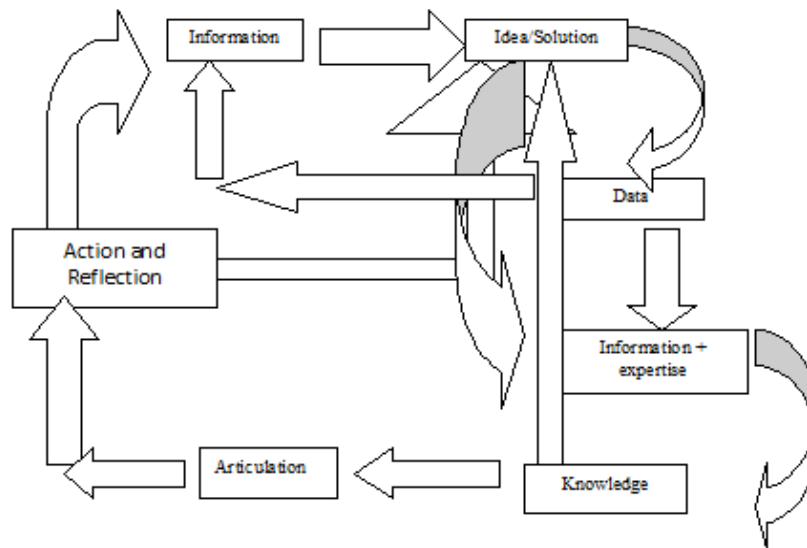
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<sup>33</sup> Akhtar, S. W. The Islamic Concept of Knowledge. *Al-Tawhid*, 12(3), (2007), p. 7

<sup>34</sup> Alavi, M., & Leidner, D. E. Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 25(1), (2001), 107-136. doi: 10.2307/3250961

<sup>35</sup> Lee, C. C., & Yang, J. Knowledge value chain. *Journal of Management Development*, 19(9), (2000), pp. 783-794.

Figure 1. Information and Knowledge Interaction



Source: Abel and Oxbrow<sup>36</sup>

Meanwhile, information is data that has been processed to extract meaning. It provides add value because it reflects processing, analysis, and comparison.<sup>37</sup> People who access information such as bibliographical or documentary references or to metadata through internet does not mean they have acquired knowledge until the information is internalized.<sup>38</sup> Each person retains pieces of information that they think important to add to their reservoir of knowledge through the filtering process.<sup>39, 40</sup> This

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<sup>36</sup> Abell, A., & Oxbrow, N, *Competing with Knowledge...*, p. 73

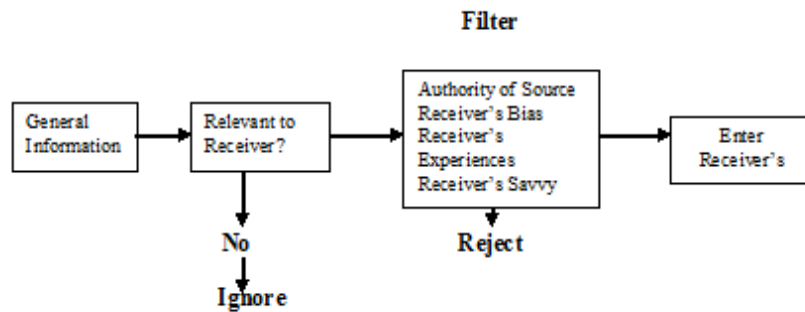
<sup>37</sup> Davis, G. B, *A Research Perspective...*

<sup>38</sup> Segundo, R. S. A new concept of knowledge. *Online Information Review*, 26(4), (2002), pp. 239-245

<sup>39</sup> Kress, G. Turning Information Into Knowledge. *Industrial Management*, 35(2), (1993), pp. 30-32.

means there is a turning process of information to be knowledge before it internalize in individual.

Figure 2  
Turning General Information into Knowledge



Source: Kress<sup>41</sup>

Knowledge is also “information in context” which reflects association and guides or rules for behavior, adds Davis. This means information will not be knowledge without being put into a context, but it depends on particular time and space<sup>42</sup>. In other words, if a person is not able to understand and apply information to anything, it remains just information<sup>43</sup>. When information has become knowledge, an individual still can acquire other individual

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<sup>40</sup> Lin, R. J., Che, R. H., & Ting, C. Y. Turning knowledge management into innovation in the high-tech industry. *Industrial Management & Data Systems*, 112(1), (2012), pp. 42-63.

<sup>41</sup> Kress, G, Turning Information...

<sup>42</sup> Nonaka, I., Toyama, R., & Konno, N. SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. *Long Range Planning*, 33(1), (2000), pp. 5-34.

<sup>43</sup> Lee, C. C., & Yang, J, Knowledge value chain...

knowledge “through one’s own experience or reflections on the experiences others”<sup>44</sup>.

### **Information Technology (IT) in Knowledge Management**

Technology support is considered very important for KM in an organization. Previous studies (e.g: Chug et al.,<sup>45</sup>) have found that KM projects are likely to succeed when a sophisticated technology infrastructure is implemented and used within organizations. A number of IT infrastructure have been used to support knowledge management process such as email, document management, data warehousing, workflow software, decision support system etc.<sup>46</sup> Chugh, et al.,<sup>47</sup> also mention that technology that other IT infrastructures such as Intranet, document management system, information retrieval engines, group wares and workflow system, brain storming applications, and data warehousing and mining tools can also be used in knowledge management.

Meanwhile Cha, Kim, & Park<sup>48</sup> suggest to use Radio frequency identification (RFID) and social network to manage the knowledge properly. Information technology for knowledge management has also been used for knowledge management in

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<sup>44</sup> Nonaka, I., & Konno, N. (1998). The Concept of “Ba”: Building a Foundation For Knowledge Creation. *California Management Review*, 40(3), 40-54.

<sup>45</sup> Chugh, et al., *The Role of Information...*, p.691

<sup>46</sup> *Ibid*, p.691

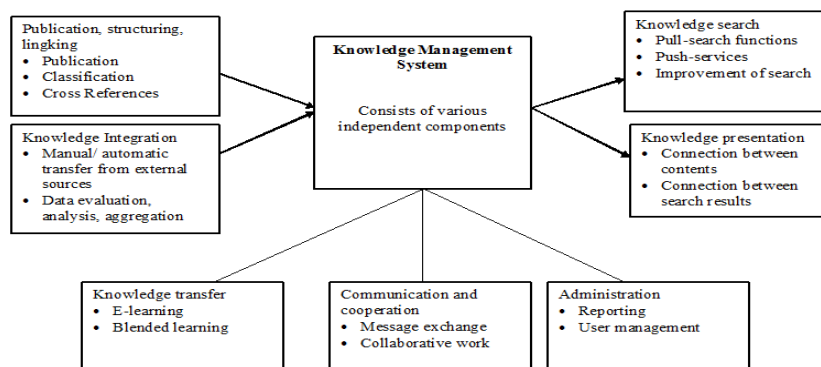
<sup>47</sup> *Ibid*, p.691

<sup>48</sup> Cha, K. J., Kim, Y. S., Park, B., & Lee, C. K. Knowledge Management Technologies for Collaborative Intelligence: A Study of Case Company in Korea. *International Journal of Distributed Sensor Networks*, 11(9), (2015), p.75

agriculture knowledge management.<sup>49</sup> This phenomenon is often called as knowledge management technologies. However, some scholars (e.g: Egbu<sup>50</sup>) also argue that the concept of knowledge management technologies is both broad and difficult to define. The notion is that even some information infrastructure technologies that appear not to fall naturally within this concept can be useful in facilitating knowledge management, for examples are video-conferencing and the telephone.<sup>51</sup>

The following figure 3 is an example of a group of information technology tools which can be used for knowledge management within organizations.

Figure 3. Information Technology Infrastructures for KM  
Sources: Schamaltz, Hagenhoff & Kaspar<sup>52</sup>



<sup>49</sup> Vipinkumar, V. P., Athira, P. V., & Mini, K. G. Role of ICT in Knowledge Management, (Kochi, Kerala: Central Marine Fisheries Research Institute, 2013), pp. 21.

<sup>50</sup> Egbu, C. O., & Botterill, K. Information Technologies For Knowledge Management: Their Usage and Effectiveness *ITcon*, 7, (2002), p. 129.

<sup>51</sup> *Ibid*

<sup>52</sup> Schmalz, R., Hagenhoff, S., & Kaspar, C. Information Technology Support for Knowledge Management in (Cooperations: University of Goettingen, Germany 2006), p.6.

The figure shows that information technology (IT) can be used for various activities of knowledge management. These include the use of IT for classification of knowledge, integration, knowledge search, and presentation. The IT also play roles in knowledge transfer, communication with internal or external environment, and for administration.

### **Islamic Bank**

Banking Act number 7 year 1992 which was amended become the Act number 10 year 2008 concerning banking system defines “bank as a business unit which collect fund from citizens in form of savings, and then it is ditributed to citizens in form of credits or any other schemes to increase community well being. Islamic banks also play these roles to support the contry economy and Muslim needs in particular.

The development of Islamic Banking in Indonesia was formally initiated in 1992. Bank Muamalat was the first Islamic bank opened on 1<sup>st</sup> of May 2002 with capital about 106 billion rupiah. At that time the existence of Islamic banks was not considered seriously by the Indonesian banking system because law infrastructure did not fully support Islamic banks. One government rule that supported the operation of Islamic banks was Banking Act no. 7 Year 1992 which included a provision to develop interest-free banks.<sup>53</sup> This Act was elucidated in the Government Decree No. 72 Year 1992 concerning Bank Applying Share Base Principles.

Through introducing the Act No.7 Indonesia recognizes the duality of banking systems, that is a system where the conventional banking system exists side by side with Islamic banking system growing together to serve the Indonesian economy. However, this Act only categorized Islamic banks as a bank with a

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<sup>53</sup> Warde, I. *Islamic Finance in the Global Economy* (2 ed.). (Edinburgh: Oxford University Press USA, 2010), p. 8.

profit sharing system. A few year later the Indonesian government introduced the Act No. 70 Year 1998 on amendment of the Act No. 7 Year 1992 concerning banking came into force to give stronger legal foundation for the existence of the Islamic banking system). The introducing of the Act No. 70 Year 1998 made the duality of banking systems; conventional banking and Islamic banking, more clear.

Since 1998 Islamic banks have grown significantly and include conventional banks that open Islamic bank divisions such as Bank Mandiri, Bank BNI, and Bank BRI, and even international bank such as HSBC. Those conventional banks compete with Islamic banks to capture the market as Indonesia is the largest Muslim country in the world. In the following year, many Islamic bank players have come into Indonesia's Islamic banking industry. By February 2003, the Islamic banking industry was represented by two full Islamic banks, 8 conventional bank which opened Islamic banking divisions, and 85 Islamic local banks. However, data from Financial Service Authority (OJK) in 2015 shows that there are about 2881 Islamic bank offices currently as shown in the following table 1.

Table 1. Islamic Banks in Indonesia. Sources: OJK<sup>54</sup>

Indicators	Year				
	2011	2012	2013	2014	2015
Conventional Bank Syariah					
- Number of bank	11	11	11	12	12
- Number of offices	1.401	1.745	1.998	2.151	2.121
Syariah Business Unit					
- Conventional bank with syariah unit	24	24	23	22	22
- Number of offices	336	517	590	320	327
Community Syariah Financing					
- Number of banks	155	158	163	163	161
- Number of offices	364	401	402	439	433
Total number of offices	2.101	2.663	2.990	2.910	2881

<sup>54</sup> OJK.. *Statistik Perbankan Syariah*, (Jakarta: Otoritas Jasa Keuangan, 2015), p. 2.



Data from OJK also shows that Indonesia's Islamic banking assets are increasing from year to year. Syariah bank assets under conventional banks increased from 205 trillion in 2014 to 2013 trillion in 2015. Meanwhile, Syariah Bank business units assets increased from 77 trillion in 2014 to 82 trillion in 2015<sup>55</sup>. It is also projected that Islamic banks assets will increase to 5 percent of total banking assets next few years. This development results from the increasing demand of Muslim people to follow their religion financial rule preference.

Islamic banking institutions conform to provisions of the Islamic Law in all its investment banking transactions through the application of financial intermediary concepts and loss/profit sharing, within the framework of agency both private and public.<sup>56</sup> As such, Islamic banks run their businesses based on the characteristics such as: the abolition of interest (*riba*) from all financial transactions; the avoidance of economic activities which involve speculation (*gharar*); levying Islamic tax (*zakat*=purification) as a means of taking care of the needy in society and as a form of income distribution; the banks do not sell products and services that contradict the value pattern of Islamic (*haram*); and provide the provision of *Takaful* (Islamic insurance).<sup>57</sup>

The rationale behind this principle is rather one of prudence, in the sense of taking all the necessary precautions to ensure that Islamic funds do not become mixed with other funds that may be involved with *riba*, *gharar*, or *haram* activities. Therefore, in order

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<sup>55</sup> *Ibid*, p.2

<sup>56</sup> Al-Khasawneh, A. L. The Role of Knowledge Resource Diversification Strategy Management in Improving Organizational Learning Among Employees at the Commercial Islamic Banks in Jordan. *International Business and Management*, 8(2), (2014), 101-111.

<sup>57</sup> Lewis, M., & Algaoud, L. M. *Islamic Banking*, (Northampton: Mascalchuset, USA Edward Elgar, 2001), p. 28.

to ensure compliance with Islamic principles, conventional banks wishing to offer Islamic products must guarantee and publicize that the funds devoted to conventional activities will not be mixed (commingled) with those destined for Islamic activities.<sup>58</sup>

### Research Method

This study employed a multiple case study<sup>59</sup>. Two Syariah Banks in Palu were selected to understand how Information Technology play roles in knowledge management within Islamic bank contexts. The cases study are Bank Mandiri Syariah and Bank BNI Syariah in Palu. The case study is appropriate for exploratory analysis when investigating contemporary phenomenon within its real-life context, and when the boundaries between the phenomena and the contexts are not clear.

Data was collected through observation, in-depth interviews, and written material, archival records, physical artifact, websites, observation and interviews.<sup>60, 61, 62, 63</sup> However, most data was obtained from in-depth interviews using the case study protocol because it was targeted and focused directly on the case study topic and provides perceived causal inferences<sup>64</sup>. In-depth interviews involved five informants from Bank Mandiri Syariah and five

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<sup>58</sup> Sole, J. *Introducing Islamic Banks into Conventional Banking Systems* (pp. 28): International Monetary Fund, (2007), p.5.

<sup>59</sup> Stake, R. E. *Multiple Case Study Analysis* (Vol. Analysis), (New York: The Guilford Press, 2006).

<sup>60</sup> Cresswell, J. W. *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*, (London: Sage Publications, 1998).

<sup>61</sup> Miles, M. B., & Huberman, A. M. *Qualitative Data Analysis: An Expanded Sourcebook*, (London : Sage Publications, 1994).

<sup>62</sup> Walsham, G. Doing Interpretive Research. *European Journal of Information Systems*, 15(3), (2006), 320-330.

<sup>63</sup> Yin, R. K. *Case Study Research - Design and Method* (3 ed.), (London: Sage, Thousand Oaks, 2003), p. 80.

<sup>64</sup> *Ibid*, p.80

informants from Bank BNI Syariah. The interviews were between 30 to 45 minutes each and they were tape recorded to preserve sense and meaning. Each informant was numbered with a code which then followed by their bank intial which are BSM for Bank Mandiri Syariah and BNI-S for Bank BNI Syariah. All informants were recruited from different level of the banks hierarchy which included the Manager, Human Resource Manager, Marketing Manager, Market Risk and Operational Manager, Information Technology Manager, and information technology Staff.

Data was analysed based on grounded theory approach outlined by Strauss and Corbin<sup>65</sup>. The data analysis was carried out through iterations; open coding, axial coding and selective coding. The author also took into consideration Urquhart, et al.,<sup>66</sup> data conceptualization strategy in gaining in-depth insight and understanding. The conceptualization process started from a simple process (description) where the researcher begins initial understanding of the concepts at the level of categories and properties through open coding. Conceptual saturation was reached when no new categories were generated from the open codes and the gap in emerging concepts were filled.<sup>67</sup>

## **Results**

### ***Background of The Case Study***

This study was carried out in two Syariah banks in Palu. The banks are Bank Mandiri Syariah dan Bank BNI Syariah. Both banks have relatively similar in employees number and business

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<sup>65</sup> Strauss, A., & Corbin, J. M. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques* (2 ed.), (California, USA: Sage Publications, 1998), Inc.

<sup>66</sup> Urquhart, C., Lehmann, H., & Myers, M. D. Putting the 'theory' back into grounded theory: guidelines for grounded theory studies in information systems. *Information Systems Journal*, 20(4), (2010), pp. 357-381

<sup>67</sup> Kendall, J. Axial Coding and the Grounded Theory Controversy. *Western Journal of Nursing Research*, 21(6), (1999), 743-757.

models. Bank Mandiri Syariah employs 43 workers in two branches in Palu, while Bank BNI Syariah have 26 employees in a single branch.

Bank BNI Syariah sells product such as saving, deposit, and funding. Funding is focused on individual funding, micro industry, and corporate. Meanwhile, Bank Mandiri Syariah also sells products such as saving, giro, deposit, and consumers funding. In selling the products, Bank BNI Syariah incorporates Islamic term “syariah” in their products to show the bank compliance with Islamic law. For example, BNI Syariah has BNI Syariah multipurposes (funding), BNI Syariah Otomotif (car or motorcycle credit funding), and BNI Syariah Gold Investment. Bank Syariah Mandiri also does similar strategy by using syariah terms in their product promotion on the website. Instead both banks operate under syariah law, the banks still requires collateral in any funding schemes offered to customers.

### ***Information Technology for Knowledge Management in Islamic Bank***

The findings of this study show that knowledge management process within two syariah banks mostly resemble to the theory proposed in this study. However, there is an important finding in this study which lead to improvement of the theory. Knowledge within bank syariah is not directly passed to storage after it is identified or created. The knowledge was intergated through various mechanism to produce common knowledge to fit bank syariah context before they are stored in the bank repository or employees memory. Each step of knowledge management within two case studies of bank syarih is dicussed in the following sub sections.

### ***Information Technology Facilities***

Both Syariah banks (BNI and Mandiri) have number information technology infrastructures to support their knowledge

management process. Both banks still share their information technology infrastructures with their conventional central banks. Information technology infrastructures are important to support both knowledge management and services. An informant from BNI Syariah said that “they built a strong foundation for information technology by preparing the human resources’ expertise in information technology through co-working with PT Bank Negara Indonesia (Persero) Tbk upon the shared system. Similar confition is also applied to Bank Mandiri Syariah where their information technology infrastructure is shared with Bank Mandiri.

According to BNI Syariah annual report along with the rapid growth in the number of employees, the utilization of appropriate systems is necessary to implement better management of human resources. The system has been updated few times since 2012 to support their business Intelligence in order to fulfill the needs for a fast and accurate information reporting system that is beneficial for the management in decision-making.<sup>68</sup> The system is embeded in an intranet system which connect all branches across Indonesia.

Bank Syariah Mandiri developed an Intranet facility since 1999 by using AS 400 software. This software was used in intranet for 6 years and now it has been upgraded three times from AS 400 to AS 710 and AS 810, said the manager of IT. Other IT instruments that are used to integrate knowledge include telephone and internet.

We use telephone to discuss a variety issues related to our products with our Sharia Advisory Board in central office in Jakarta. Sometimes we come across a problem when we want to finance certain business and telephone is a good facility to

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<sup>68</sup> BNI Syariah. *Teknologi Informasi : Laporan Tahunan 2014*, (Jakarta: BNI Syariah, 2014), p. 29.

use because we can talk directly with the source. (BSM Participant B)

Both banks have web sites and e-mail infrastructures to acquire and share new knowledge among employees. Bank Syariah Mandiri use information technology to integrate two different groups of workers knowledge to support their business processes. This integration process was done through some IT infrastructures to promote knowledge sharing and transfer among the employees.

“We have some information technologies that support the knowledge integration such as internet, intranet, and telephone” (BSM Participant A).

Both syariah banks also created social media sites to support their knowledge management process. Employees can use the social media sites for communication and interaction in 24 hours. The social media sites are important not only for explicit knowledge management but also for implicit knowledge management. A number of information technology infrastructures which are used for knowledge management within both syariah banks are summarized in table 1 as follows:

Table 1  
Information Technology Infrastructure in Islamic Bank  
Knowledge management

No	IT Infrastructures	Purposes
1.	Internet	It is used for information searching and communication with internal and external stakeholders.
2.	Intranet	It is used for internal discussion, information exchange, information distribution, knowledge sharing and transfer across internal employees.
3.	Telephone	It used for communicating information in the form one to one employees.
4.	Database	The database is used to stores information and knowledge. It is functioned as organization collective memory. The information and knowledge within the database can be retrieved and re-

		distributed when it is needed.
5.	Websites	The websites are used to store information related to the banks' product and information as well as Islamic knowledge.
6.	E-mail	Email is use for communication between employess within the branch and with other branches across Indonesia. Information and knowledge are circulated through the email facilities.
7.	Social media (facebook and twitter	Mostly social media sites are use to communicate with custimers. However, the social media sites are also used to keep employees engangement each others in particular relating to explicit and implicit knowledge sharing and transfer.

### ***The Roles of Information Technology (IT) in Islamic Bank Knowledge Management***

Information communication technologies such as internet, intranet, telephone, and facsimile have become a familiar source of communication instruments within both banks. Integration, sharing, and storing knowledge are three common activities carried out through the use of information technology infrastructures. Those findings are presented in the following sub sections.

#### **IT for Knowledge Transfer**

The utilization of IT for knowledge integration process have been widely used within both banks. Using Information Technology to support knowledge integration process is not only to help the sharing and transferring of knowledge among employees inside Bank Syariah Mandiri Palu but it is also to share and transfer knowledge among staff in a branch and between branches.

“We use ICT such as telephone to share knowledge between unit in our branch, between our branch and other branches and between our branch and central office in Jakarta”.  
(Participant C BSM)

The participant added that using IT is very effective in knowledge integration because staff have limited time to acquire

knowledge from printed document such as guidance books and brochures. They prefer to use intranet to share and transfer knowledge among the staff because it is unlimited access and easy.

“Using the intranet for knowledge sharing and transfer is very easy because it uses Indonesian language and we can use it any time” (Participant A BNI-S).

Another participant from Mandiri Syariah said as follow;

“I prefer using intranet and telephone to communicate with other staff because it is very easy” (Participant D BSM).

Any new job descriptions and new knowledge from central office are released through the intranet to make it accessible for all employees. “*We can access variety of knowledge related to job guidance such as how the staff do their job professionally*” (Participant E BSM)

However, not all staff able to use information technology such as intranet and internet.

“We have problem that some of our staff can not use information technology properly and maximally”. (Participant B BNI-S).

According to the participant, Intranet also creates opportunity to staffs to be involved in communication forums between all employees within the bank. This forum is used as medium knowledge integration among staffs inside the branch, between one and other branches, and between central office and branches. Meanwhile, internet support staff to acquire knowledge from outside of the Bank Syariah such as National Syariah Advisory Board. All staff can access the network to support their job performance.

### **IT for Knowledge Storage**

Other than internal database system, the bank’s official websites are also used to store knowledge online. Both bank Mandiri Syariah and BNI Syariah store knowledge within an



internal information system and websites. This system allow employees to acces all information they required to solve a problem or improve their knowledge. Bank Mandiri Syariah also store knowledge on their corporate websites. Under *Edukasi Syariah* facility, employees can acces various syariah knowledge on the website such as syariah finance, syariah wealth management, women role in family finance management, donation (sadaqah), tawakkal, etc. This online knowledge repository helps employees if they need a solution for their job. For example, an informant from Bank Syariah Mandiri stated that:

If I do not know something relating to Islamic issues, I go there (website) to find Shariah fatwas and look into the Q & As (question and answer facility on the website), which discusses latest concerns in Islamic Banking (Informant B from BSM).

Bank BNI Syariah stores their valuable knowledge in their database which can be accessed all the time if required. The bank calls this knowledge as “business intelignence” because it plays crucial role in the succes of the bank’s business operation. This type of knowledege is also stored by Bank Mandiri Syariah. This intelligence knowledge was harnested from employees experiences, mass media and research. Bank Mandiri Syariah has three information system which are used to store their knowledge. They are; Human Resources Information System (HRIS), Learning Management System (LMS), and Competency Based Human Resources Management (CBHRM). Employees can use those information system to access knowledge such as throug e-learning system.<sup>69</sup>

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<sup>69</sup> Bank-Mandiri-Syariah. (2016). Education and Training Programs Retrieved 26 July 2016, from Bank Mandiri Syariah <http://www.syariahmandiri.co.id/en/category/karir/human-capital/>

## **IT for Knowledge Sharing**

There is a policy from the management to encourage staff to use information technology for the transferring and sharing of knowledge. The use of information technology for knowledge integration activities are based on the awareness of the staff themselves.

“Management encourages staff to use IT for knowledge transfer and sharing; we let them increase their awareness of the importance of IT for the knowledge sharing process. We do not allow staf to keep important information for their own benefits. They have to share it with other employees” (Participant D from Bank BNI-S)

In terms of sharing knowledge, as a process of knowledge and cultural integration, both Bank Syariah have established a culture of mutual teaching among employees.

“Our company culture obliges senior staff to transfer knowledge to junior staff and vice versa” (Participant E from BSM).

Another informant from Bank BNI Syariah also expressed same fact as follow:

“We often have interesting discussions and interactions with other staff in my work place and I often get support from the division manager” (Informan A from BNI-S).

This habit has become the banks’ organizational culture which is understood as shared beliefs, values, and practices of a group or groups within the organization”.<sup>70</sup>

Information communication technologies such as internet, intranet, telephone, and facsimile have become a familiar source of communication instruments within both Banks Syariah. Sharing

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<sup>70</sup> Anantatmula, V. S. Impact of cultural differences on knowledge management in global projects. *VINE*, 40(3/4), (2010), p. 242.

knowledge among the employees have been done through the utilizing those IT. The use of IT such as discussions via teleconferencing, videoconferencing, and email lists for knowledge sharing has been addressed in previous studies (e.g: Ali, Whiddett, & Tretiakov<sup>71</sup>).

Using Information Communication Technology to support knowledge sharing process is not only to help the sharing and transferring of knowledge among employees inside both Banks Syariah but it was also to share knowledge among staff in a branch and between branches.

“We use IT such as telephone to share knowledge between unit in our branch, between our branch and other branches and between our branch and central office in Jakarta”. (Participant B from BNI-S)

Social media has become a strategic instrument to shared knowledge among employees within both banks. Both bank Mandiri and Bank BNI Syariah have Facebook and Twitter account for their employees knowledge sharing. Through the social media sites, employees can socialize and shared knowledge among them.

## **Discussion**

The discussion covers three main issues that were found in the data. The issues are information technology infrastructure for knowledge management and the the roles of the IT infrastructures in support the knowledge management in Islamic banks. This section discussed both issues and relate them to the theory.

The findings show that both Syariah banks posses a number of information technology infrastructures to support their knowledge management process. Information technology infrastructures become a important tools to succeed knowledge

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<sup>71</sup> Ali, N., Whiddett, D., & Tretiakov, H. The use of information technologies for knowledge sharing by secondary healthcare organisations in New Zealand. *Int J Med Inform.*, 81(7), (2012), p. 500-506.

management to increase their business performance. The success of knowledge management due to the availability of information technology has been addressed by previous studies such as Alrawi & Elkhatib<sup>72</sup>, Borghoff & Pareschi<sup>73</sup>, and Cha, et al.,<sup>74</sup>.

The development of Information technology should be directed at improving knowledge management, increasing customers' services system, information technology carrying capacity expansion and increase in management information system. In addition, the utilizing of information technology such as Internet should also be diffused across the bank organization level. Access to Information technology might improve the transfer of explicit and tacit knowledge and to facilitate the knowledge conversion spiral as stated by Nonaka<sup>75</sup>.

Once the knowledge has been deemed valuable to the bank organizations based on the analysis and assessment, it is stored as an active component of the organizational memory<sup>76</sup>. Nonaka<sup>77</sup> and Hansen, et al.,<sup>78</sup> also suggest companies to codify knowledge carefully and store it in single integrated storage or database. It is also suggested that only explicit knowledge can be stored and re-accessed in multiple times. Meanwhile, tacit knowledge is not

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<sup>72</sup>Alrawi, K., & Elkhatib, S. Knowledge Management Practices In The Banking Industry: Present And Future State - Case Study. *Journal of Knowledge Management Practice*, 10(4), (2009).

<sup>73</sup> Borghoff, U. M., & Pareschi, Information Technology....

<sup>74</sup> Cha, et al., Knowledge Management Technologies ...

<sup>75</sup> Nonaka, I, The Knowledge-Creating Company ...

<sup>76</sup> Evans, M. M., Dalkir, K., & Bidian, C. A Holistic View of the Knowledge Life Cycle: The Knowledge Management Cycle (KMC) Model. *Electronic Journal of Knowledge Management*, 12(2), (2014), pp. 85-97.

<sup>77</sup> Nonaka, I, The Knowledge-Creating Company ...

<sup>78</sup> Hansen, M. T., Nohria, N., & Tierney, T. What's Your Strategy for Managing Knowledge? In J. A. Wood & J. Cortada (Eds.), *The Knowledge Management Yearbook 2000-2001*, (Boston: Harvard Business Review, 2002).

possible to be stored in a storage or database system. Instead tacit knowledge is stored in the mind of inventors or employees<sup>79</sup>.

Knowledge assets are retrieved from the organizational memory, to be shared (disseminated/communicated) both internally and externally<sup>80</sup>. Key success factor for knowledge sharing are organizational culture and information technology (IT) facilities<sup>81</sup>. Social media is an information technology that allows employees within both syariah banks to communicate and interact online to improve common culture within Islamic bank organizations. This strategy has been suggested by previous studies such as Panahi, Watson, and Partridge<sup>82</sup>. Kingston<sup>83</sup>, even, strongly recommed organizations to use social media sites such as websites, Wikis, and Blogs to share knowledge among employees.

### **Conclusion**

The findings show that both syariah banks have various information technology infrastructures to support their knolwedge management. The information technology infrastructures includes internet, intranet, internal information system management, emial, websites, and social media sites. Those information technology

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<sup>79</sup> Ernst, H. Patent information for strategic technology management. *World Patent Information*, 25(3), (2003), 233-242

<sup>80</sup> Evans, et al., A Holistic View of the Knowledge Life Cycle ...p.176

<sup>81</sup> Pantouvakis, J.-P., Johansson, T., Moehler, R. C., & Vahidi, R. Selected papers from the 26th IPMA (International Project Management Association), World Congress, Crete, Greece, 2012 Knowledge Sharing Strategies for Project Knowledge Management in the Automotive Sector. *Procedia - Social and Behavioral Sciences*, 74, (2013), p. 295-304

<sup>82</sup> Panahi, S., Watson, J., & Partridge, H. *Social Media and Tacit Knowledge Sharing: Developing a Conceptual Model*. Paper presented at the World, (2012).

<sup>83</sup> Kingston, J. K. C. (Tacit Knowledge: Capture, Sharing, And Unwritten Assumptions. *Journal of Knowledge Management Practice*, 13(3), 2012).

infrastructures become important tools for various knowledge management activities such as storing, transferring, and sharing knowledge.

The finding also shows that information technology infrastructures have played roles in supporting knowledge storing. For example, internal database system and official websites are used to store knowledge within both syariah banks. The information technology have also played roles in transferring and sharing knowledge among employees within local branches and with other branches across Indonesia.

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