

KNOWLEDGE MANAGEMENT SYSTEMS: THE CURRENT PRACTICE IN THAILAND

THANYATIDA GUNADHAM*, NITHINANT THAMMAKORANONTA

Graduate School of Applied Statistics, National Institute of Development Administration,
118 Moo3, Serithai Road, Klong-Chan, Bangkok, Thailand 10240

*Corresponding Author: thanyatida@gmail.com

Abstract

Knowledge Management Systems (KMSs) have been widely used in various industries to facilitate knowledge management activities for improving organizational performance. Despite KMSs being successfully implemented and used in developed countries still, they are not as successful as they should be in Thai organizations. People are facing difficulties when using KMSs in their organizations. This paper aims to investigate KMSs utilization in Thailand, as well as, to identify gaps and problems occurring during knowledge discovery, knowledge capture, knowledge sharing, and knowledge application processes.

Keywords: Knowledge management, Knowledge management systems,
Organization performance.

1. Introduction

The concept of Knowledge Management (KM) has been widely introduced and discussed in businesses and society. Knowledge refers to a personal belief enhanced by culture, experience, and education to increase the human's ability to take actions effectively [1]. Knowledge is an essential resource for modern organizations, because knowledge is perceived as one of the critical elements in many organizations' success [2]. Knowledge can support the innovation of products, which can change the way organizations operate to be competitive in the market [3].

KM refers to a systematic process organizationally specified to acquire, organize, maintain, utilize, share, and reproduce both tacit and explicit knowledge of individuals [1, 3]. The objective of this process is to improve the organization performance and adaptability, as well as to develop new products, processes, and services [3, 4]. Moreover, to manage knowledge, organizations need to manage intellectual assets, organizational capabilities, and processes with an emphasis on knowledge development and learning [5]. For this reason, many organizations invest in KMSs to facilitate knowledge acquisition, development, and usage [6].

KMSs are the information systems designed for facilitating the codification, collection, integration, and distribution of organizational knowledge [1]. They can enable the organization to be more flexible, responsive, innovative, and productive [1]. KMSs have a significant positive impact on the organization's performance as proved by several researchers [7-9]. However, many efficient KMSs still have problems with innovation, especially the implementation of new advanced technological processes [10]. For example, Google Search Appliance can be integrated with the organization portal and return a blended search results page [11]. Other concern is about the staff, especially employee training, and finances, as well as technology, specifically database and process [10].

For example, employees are reluctant to participate in knowledge sharing because they are afraid that another employee will work better [12]. Employees tend to withhold their knowledge from others, especially in online communities because the knowledge provider is not approached by the knowledge seeker directly [13]. This raises the research's interest to identify gaps and problems about KMSs in practice. Those problems might be related to knowledge sharing, employee training, systems limitation, etc. This study has conducted a survey of the selected organization. The survey was performed as an interview. The survey questions were developed based on the KM processes defined by Becerra-Fernandez and Sabherwal [14]. The result of this research would increase the organization awareness regarding KMSs functionalities and current problems occurred from KMSs utilization.

2. Literature Review

2.1. KM processes

This research has adopted KM processes and subprocesses based on the work of Becerra-Fernandez and Sabherwal [14]. Their theory identified four main KM processes and seven KM subprocesses by considering tacit and explicit knowledge as presented in Fig. 1 [14]. Tacit knowledge refers to the unarticulated knowledge, which is personal, practical, context precise, hard to formalize, and difficult to communicate to others such as know-how, procedures, processes, etc. [4,6].

Explicit knowledge is codified knowledge, which can be stored in certain documents and easily communicated to others through various methods such as text, computer output, and spoken or written words [1, 4, 6].

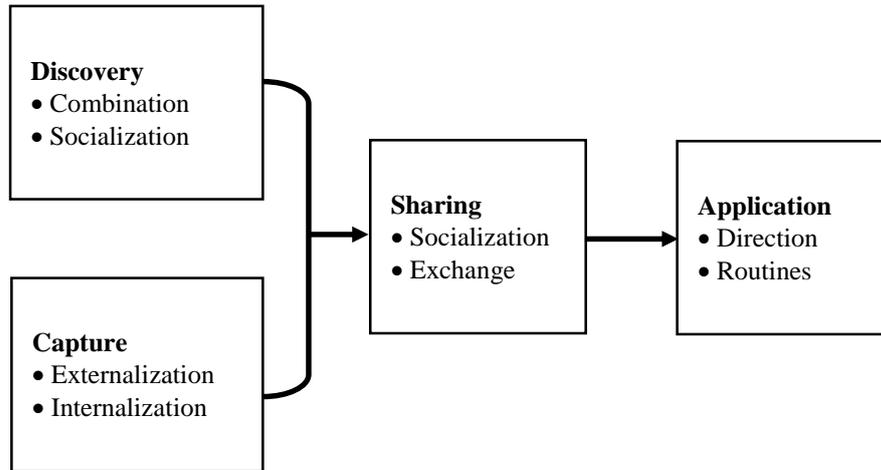


Fig. 1. KM processes.

Knowledge discovery refers to the development of new tacit or explicit knowledge from combining data, information, or prior knowledge, socialization, and hiring new employees or by forming external alliances [14, 15]. New explicit knowledge is discovered through combination process, while new tacit knowledge is created through the mechanism of socialization. KM technologies are used to support combination process are databases, Web-based access to data, data mining, repositories of information, Web portals, best practices, lessons learned, etc. KM technologies such as video-conferencing, electronic discussion groups, e-mail, etc. support socialization process. Knowledge capture refers to the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities. Technologies can support these activities by facilitating externalization and internalization processes. Externalization process refers to the conversion of tacit knowledge into explicit form, while internalization process refers to the conversion of explicit knowledge into tacit form. Technologies that support externalization process are expert systems, chat groups, best practices, and lessons learned databases, while technologies that support internalization process are computer-based communication, artificial intelligence-based knowledge acquisition, and computer-based simulations.

Knowledge sharing refers to the process of communicating explicit or tacit knowledge to other individuals, groups, departments or organizations and the recipients of knowledge need to understand and be able to perform further action [14, 15]. Socialization process emphasizes the sharing of tacit knowledge, while exchange process focuses on the sharing of explicit knowledge. Technologies that facilitate exchange process are team collaboration tools, Web-based access to data, databases, and repositories of information, best practices databases, lessons learned systems, expertise locator systems, etc. Technologies that facilitate socialization process are video-conferencing, electronic discussion groups, e-mail, etc. Knowledge application

refers to the actual use of knowledge for adjusting strategic direction, solving new problems, and improving efficiency [15]. Knowledge utilization does not involve the actual transfer or exchange of knowledge between the individuals but only the transfer of the recommendations related to the particular context [14]. Knowledge utilization benefits from routines and direction processes. Direction is the process, which the owner of the knowledge directs the action involving instructions or decisions to another individual without transferring the knowledge underlying the direction. Routine process refers to the utilization of knowledge embedded in procedures, rules, and norms that guide future behavior. Technologies supporting direction process include experts' knowledge embedded in expert systems, decision support systems, troubleshooting systems based on the use of case-based reasoning technologies, etc. Technologies supporting routine process include expert systems, enterprise resource planning systems, management information systems, etc.

2.2. KMSs and functionalities

With the utilization of KM processes, the individuals and organizations can have access to relevant information and use whenever needed to enable the effectiveness and productiveness of their work. In order to support the collection, integration, and dissemination of knowledge, KMSs are introduced to organizations. KMSs are also used to maximize the value of knowledge assets within organizations because they also support the integrated KM process [16]. For example, managers and project members of the large or medium-scale projects need to communicate with each other regularly through communication-based project management tools.

These tools can be used to capture daily reports from members and share these reports among members. Therefore, the members can check the deliverables from the systems on a regular basis. In addition, KM platforms, tools, and processes can support knowledge integration by linking, adapting, and dynamically representing organizational information and knowledge [16]. This also enables personal/organizational learning and innovation.

This research considered Technology Acceptance Model (TAM) [17] because it is widely accepted as a model to predict acceptance of new technology by individuals. TAM illustrated that the characteristics of the systems influence the user behaviors through the perception of the usefulness and ease of use of the systems. Also, KM Life Cycle Model [18] and relevant studies in the literature [6, 19-21] were considered to identify the key functionalities of KMSs, supported by Web 2.0 technologies. These essential functionalities are Deposit, Search, Browse, View, Download, Rate/Comment, Knowledge Filter, Automatic Recommendations, Bookmark, Mash-ups, Annotate, View Annotations, Social Tagging, Personal User Accounts, Forums, RSS Feeds, Wikis, Blogs, and Social Networks.

3. Research Methodology

Research questions were addressed as follows;

- Research question 1: What are KMSs or KM tools used by the organization to support KM processes?
- Research question 2: What are the current problems occurred from KMSs utilization?

This research used the structured interview approach to collect the data from the KM experts in organizations using a homogeneous purposive sampling technique [22]. This technique allowed researchers to select organizations, which use KM tools or systems. Those organizations varied in sizes and were from various industries such as banking, telecommunication, oil and gas, and internet software and services as shown in Table 1.

Table 1. Organization list.

Organization	Industry	Organization Size [23]
A	Banking	Approx. 25,000 employees
B	Internet software and services	Approx. 500 employees
C	Oil and gas	Approx. 4,600 employees
D	Telecommunication	Approx. 4,300 employees
E	Banking	Approx. 23,800 employees
F	Telecommunication	Approx. 2,300 employees

From six organizations, ten experts, who have been working in KM area for more than five years, were interviewed. Those experts have strong background knowledge about KM and have experiences with KM tools and systems. The interview questions developed primarily based on KM processes by Becerra-Fernandez and Sabherwal [14]. The questions intended to collect the existing KMSs, the functionalities, and the actual problems found in the organization. All questions were revised six times before actual interview by Information Systems professors and practitioners. All questions were piloted and rehearsed with three information systems practitioners. This should be effective in terms of content validity, face validity, and reliability. After each interview, the interviewees' scripts were sent to three other researchers for analyzing the answer for each question independently. One of the researchers has working experiences in the field of KM, while another two researchers earned a degree in Information Systems Management. Then, the answers from each researcher were collected and discussed together to conclude the answer. This methodology followed the content analysis with investigator triangulation [24] to reduce the bias from researchers.

4. Results and Discussion

The results from the interview were analyzed using content analysis. Many organizations especially those with more than 4,000 employees are currently having or using SharePoint. SharePoint is the Intranet that works as an organization's collaborative platform from Microsoft and usually integrated with Microsoft Office [25]. However, most experts agreed that SharePoint is not one of the successful tools for their KM. Many experts found that SharePoint is difficult to use, and the performance is quite slow. Instead, those experts use their own in-house development portals, which are easy to use and contain all the necessary information and knowledge. The result aligns with the concept of TAM [17]. The employee will not use the systems if they feel that the systems are not useful or difficult to use. KM portal is also used even though the organizations already have SharePoint. KM portal is the Intranet that publishes only the content of knowledge without any collaborative functions.

Trello, a team collaboration tool from Atlassian Corporation [26], is used only in one organization to publish contents and work collaboratively on tasks and

projects. Most organizations still use Share drive, an organization local file storage, to store, manage, and distribute knowledge. Some organization even uses Google Drive, a cloud storage application from Google [27], together with the Share drive for the same purpose as well. Some organizations especially those in the telecommunication industry have started to move KMSs platform from regular browser to mobile application. Moreover, there is an increasing trend for the use of Line, an application providing free message texting, free calls, and free video calls from Line Corporation [28]. The existing KMSs and technologies used in the organizations are presented in Table 2.

Table 2. Existing KMSs and technologies.

Organization	Existing KMSs and Technologies	Duration	User Perception of Systems Success
A	SharePoint	1 year	Not successful
	Intranet portal (in-house development)	> 5 years	Successful
	Share drive	> 5 years	Successful
	Content Management Systems	> 5 years	Successful
	E-learning	> 5 years	Successful
B	Web portal (in-house development)	> 5 years	Successful
	Share drive	2 years	Successful
	Google Drive	> 5 years	Successful
	Trello	2 years	Successful
C	SharePoint as group portal and department portal	3 years	Successful
	KM portal (content only)	10 years	Successful
	E-learning	10 years	Successful
	Document Management Systems	10 years	Successful
D	SharePoint	10 years	Not successful
	Share drive	2 years	Successful
	Document Management Systems	> 10 years	Successful
	Learning Management Systems	> 5 years	Not successful
	E-learning (mobile application)	2 years	Successful
E	Intranet portal (in-house development)	10 years	Successful
	KM website	3 years	Not successful
	SharePoint	3 years	Not successful
	Share drive	> 10 years	Successful
	Google Drive	> 5 years	Successful
	Content Management Systems	> 5 years	Successful
	Document Management Systems	> 5 years	Successful
F	Intranet portal (in-house development)	> 10 years	Successful
	E-learning	5 years	Successful
	Share drive	5 years	Successful
	Internal Communication Systems (mobile application)	5 years	Successful

In terms of KMSs functionalities, only two organizations (A, D) have all functions identified in the literature review. However, they do not feel that all KM systems in their organization are successful. Having all KMSs functionalities does not always mean that the user will use the systems as the actual system use directly depends on the attitude toward using [17]. Organization C has almost all functions with only one function under the development and they feel that their systems are successful. Three organizations (B, E, F) lack of several functions but organization B and F still feel that their systems are successful. Perhaps, the features of the systems are not as important as the user attitude toward the use of the systems to consider the actual system use or even measure the success of the systems. This supports the concept of TAM [17]. Furthermore, the functions like Mash-ups, tagging related, Wikis, Blogs, and Social Networks might not be necessary for Thai organizations due to organizational culture. The organization functionalities checklist is listed in Table 3.

Table 3. Functionalities checklist.

KMSs Functionalities	A	B	C	D	E	F
Deposit	/	/	/	/	/	/
Search	/	/	/	/	/	/
Browse	/	/	/	/	/	/
View	/	/	/	/	/	/
Download	/	/	/	/	/	/
Rate/Comment	/	/	/	/	/	/
Knowledge Filter	/	/	/	/	/	/
Automatic Recommendations	/	/	Under development	/	/	-
Bookmark	/	/	/	/	/	-
Mash-ups	/	-	/	/	/	-
Annotate	/	/	/	/	-	-
View Annotations	/	/	/	/	-	-
Social Tagging	/	/	/	/	-	-
Personal User Accounts	/	/	/	/	/	/
Forums	/	/	/	/	/	/
RSS Feeds	/	/	/	/	/	/
Wikis	/	-	/	/	-	/
Blogs	/	-	/	/	/	-
Social Networks	/	-	/	/	-	/

The problems found in the organizations during knowledge discovery, knowledge capture, knowledge sharing, and knowledge application processes are presented in Tables 4, 5, 6, and 7 respectively.

From Table 4, the most common problems found in two or more organizations during combination process are lack of document content or image search, violate or no standard file naming convention, lack of enterprise search, and not enough storage space. The only one common problem during the socialization process is that people rarely contribute to express the opinion.

Table 4. Problems in organizations during knowledge discovery process.

KM Subprocesses	Problems	A	B	C	D	E	F
Combination	Lack of knowledge of new tools	X					
	Tools are difficult to use	X					
	Lack of document content/image search	X		X			
	Violate or no standard file naming convention	X	X				
	Lack of official expert profile		X				
	Lack of a systematic process for cleansing knowledge			X			
	Lack of enterprise search				X		X
	Not enough storage space				X	X	
	Information is incorrectly categorized				X		
	Some contents are too long (video)				X		
	Information is not up to date					X	
	Information is published in many places					X	
	Socialization	People rarely contribute to express the opinion	X	X	X		
Miss some information due to fast flowing of chat messages			X				
People rarely use Forums anymore						X	
Chat messages cause information misleading and inefficiency						X	
A higher volume of Line usage than internal communication systems							X

From Table 5, the organizations face different problems during the externalization process causing no common problems among them. The most common problem found in two or more organizations during the internalization process is some knowledge loss. This problem occurs during or after learning. After learning, employees rarely use knowledge from some learning courses because the acquired knowledge is not applicable to their works. Another problem is that some employees are not interested in any training courses. This might prevent the occurrence of the internalization process.

Table 5. Problems in organizations during knowledge capture process.

KM Subprocesses	Problems	A	B	C	D	E	F	
Externalization	Too much effort for creating manuals or documents		X					
	Knowledge assets are scattered throughout the organization		X					
	Difficult to create and update documents due to dynamic nature of the business		X					
	Incompletely identify all best practices				X			
	Lack of updating and maintaining existing documents, develop new documents instead					X		
	Privacy of best practices and lessons learned						X	
	Knowledge loss due to employee resignation							X
Internalization	Some knowledge loss	X	X	X				
	Unavailability of training materials if employees do not register for the course				X			
	Some employees are not interested in any training courses					X	X	
	LMS performance is slow during concurrent use					X		
	LMS contents are limited to the group level of business, do not support local content					X		
	LMS is difficult to use especially for new users due to many steps required					X		
	The content is too long (2 hours)						X	
	Employees rarely use knowledge from some learning courses for their works							X

From Table 6, the most common problem found in three organizations during the socialization process is that people rarely contribute to express the opinion. This is one of the critical problems in knowledge sharing. Thai employees are hardly socialized in the work environment. The organizations experience a few problems during the exchange process with no common problems.

From Table 7, the organizations face different problems during the direction process; therefore, no common problems among them. The most common problem found in two organizations during the routine process is that the systems have some incorrect information. This problem occurs during the waiting period when the internal information needs to be combined and updated with the external information.

Table 6. Problems in organizations during knowledge sharing process.

KM Subprocesses	Problems	A	B	C	D	E	F
Socialization	People rarely contribute to express the opinion	X	X	X			
	Miss some information due to fast flowing of chat messages		X				
	Too much focus on mass KM sharing activity			X			
	People rarely use Forums anymore						X
	Chat messages cause information misleading and inefficiency						X
	A higher volume of Line usage than internal communication systems						
Exchange	Lessons learned are not centrally stored, only shared during gap analysis				X		
	Internal communication systems are unable to support document file, need to use Google Drive to store and share the file via links						X

Table 7. Problems in organizations during knowledge application process.

KM Subprocesses	Problems	A	B	C	D	E	F
Direction	System performance is slow, takes time to retrieve information	X					
	Lack of information relevance causing the decrease in information correctness	X					
	Lack of clear procedure regarding new product launch causing the delay of information arrival	X					
	Some processes are not documented due to dynamic nature of the business					X	
	Data are distributed across several departments, no centralized team responsible for central data warehouse						X
	Need to find information from several sources because several systems are not integrated						
Routines	Data are not centrally stored	X					
	Lack of unstructured data collection and preparation	X					
	Social network data is not real-time (retrieve weekly)		X				
	Some incorrect information			X		X	
	Some information is not updated real-time			X			
	ERP is not user-friendly, requires many steps					X	

5. Conclusions

The research result addresses various types of KMSs and KM tools currently used by selected organizations to support KM processes. Most organizations are currently having or using SharePoint, but they do not perceive SharePoint as one of the successful tools for KM. They feel that SharePoint is difficult to use, and the performance is quite slow. They use their own in-house development portals and KM portal instead of SharePoint. Share drive is still used by most organizations and sometimes used along with Google Drive. The line is increasingly used for personal collaboration due to its popularity in Thailand. However, some organizations are concerned about information privacy when employees communicate through Line. Moreover, KMSs platform is moved from regular browser to mobile application, especially those in the telecommunication industry.

This might be the future trend of KMSs as most employees are now using a smartphone. In addition, the current problems occurred from KMSs utilization is identified. The highest numbers of problems (12 items) occur during combination process within the knowledge discovery process. The combination process also has the highest number of common problems (4 items), which are lack of document content or image search, violate or no standard file naming convention, lack of enterprise search, and not enough storage space. This implies that the organizations still face the challenges in dealing with explicit knowledge. Search and categorization functions still need to be improved. Another critical problem is that people rarely contribute to express the opinion. This would prevent tacit knowledge creation and sharing.

The organizations need to encourage their employees in knowledge contribution and gradually build up this organizational culture. The problem with knowledge loss during or after learning is also critical. The organizations should not provide mass training, which is not applicable to the individual works. On the other hand, there should be the particular training courses for the specific employees, so they can apply this knowledge to their works. Because the organizations investigated in this research are from various industries, it is possible that the result shows less number of common problems compared to the total number of identified problems.

Abbreviations

KM	Knowledge Management
KMSs	Knowledge Management Systems
TAM	Technology Acceptance Model

References

1. Singh, J. (2013). Practicing knowledge management system. *International Journal of Information, Business and Management*, 5(4), 209-230.
2. Helander, N.; Kukko, M.; and Virtanen, P. (2010). Cutting costs and making profits through knowledge management. In *Knowledge Management*. InTech.
3. Handzic, M. (2004). *Knowledge management: through the technology glass*. Singapore: World Scientific Publishing Company.

4. Gerami, M. (2010). Knowledge management. *International Journal of Computer Science and Information Security*, 7(2), 234-238.
5. Ferraresi, A.A.; Quandt, C.; dos Santos, S.; and Frega, J. (2012). Knowledge management and strategic orientation: leveraging innovativeness and performance. *Journal of Knowledge Management*, 16(5), 688-701.
6. Sampson, D.G.; and Zervas, P. (2013). Learning object repositories as knowledge management systems. *Knowledge Management & E-Learning*, 5(2), 117-136.
7. Shehata, G.M. (2015). Leveraging organizational performance via knowledge management systems platforms in emerging economies: Evidence from the Egyptian Information and Communication Technology (ICT) industry. *VINE*, 45(2), 239-278.
8. Valmohammadi, C.; and Ahmadi, M. (2015). The impact of knowledge management practices on organizational performance: A balanced scorecard approach. *Journal of Enterprise Information Management*, 28(1), 131-159.
9. Abubakar, A.M.; Elrehail, H.; Alatailat, M.A.; and Elçi, A. (2017). Knowledge management, decision-making style and organizational performance. *Journal of Innovation & Knowledge*
10. Chaikovska, I.I. (2015). Evaluation of enterprise knowledge management system. *Actual Problems in Economics*, 172, 221-229.
11. Doane, M. (2010). Cost-benefit analysis: Integrating an enterprise taxonomy into a SharePoint environment. *Journal of Digital Asset Management*, 6(5), 262-278.
12. Bencsik, A. (2014). Why do not knowledge management systems operate? *Problems of Management in the 21st Century*, 9(1), 18-26.
13. Haas, M.R.; Criscuolo, P.; and George, G. (2015). Which problems to solve? online knowledge sharing and attention allocation in organizations. *Academy of Management Journal*, 58(3), 680-711.
14. Becerra-Fernandez, I.; and Sabherwal, R. (2015). *Knowledge management: systems and processes*. New York: Routledge.
15. Ling, L.S. (2011). Defining knowledge management (KM) activities from information communication technologies (ICTs) perspective. *Journal of Organizational Knowledge Management*, 2011, 1-10.
16. Mohannak, K. (2014). Challenges of knowledge integration in small and medium enterprises. *Knowledge Management & E-Learning*, 6(1), 66-82.
17. Davis, F.D. (1993). User acceptance of information technology: System characteristics, user perceptions, and behavioural impacts. *International Journal of Man- Machine Studies*, 38(3), 475-487.
18. Raja, K.R.; and Senthil, C.S. (2009). An empirical study on the impact of KM life cycle activities on the km benefits of IT organizations. *IUP Journal of Knowledge Management*, 7(3/4), 80-95.
19. Antonova, A.; Gourova, E.; and Nikolov, R. (2009). Extended architecture of knowledge management system with Web 2.0 technologies. *Proceedings of the 10th European Conference on Knowledge Management*. Vicenza, Italy.
20. Bibikas, D.; Kourtesis, D.; Paraskakis, I.; Bernardi, A.; Sauermann, L.; Apostolou, D.; Mentzas, G.; and Vasconcelos, A.C. (2008). Organizational

- knowledge management systems in the era of enterprise 2.0: The case of OrganiK. *Scalable Computing, Practice and experience*, 9(4), 315-327.
21. Scherp, A.; Schwagereit, F.; and Ireson, N. (2009). Web 2.0 and traditional knowledge management processes. *Proceedings of the International Workshop on Knowledge Services & Mashups*. Solothurn, Switzerland.
 22. Etikan, I.; Musa, S.A.; and Alkassim, R.S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4.
 23. The Stock Exchange of Thailand (2017). Retrieved August 7, 2017, from <https://www.set.or.th>.
 24. Archibald, M.M. (2016). Investigator triangulation: a collaborative strategy with potential for mixed methods research. *Journal of Mixed Method Research*, 10(3), 228-250.
 25. Microsoft (2018). SharePoint 2016, Team collaboration software tools. Retrieved January 13, 2018, from <https://products.office.com/en-us/sharepoint/collaboration>.
 26. Atlassian. (2018). Trello. Retrieved January 13, 2018, from <https://trello.com>.
 27. Google (2018). Google Drive – cloud storage and file backup for photos, docs and more. Retrieved January 13, 2018, from <https://www.google.com/drive>.
 28. Line Corporation (2018). Line. Retrieved January 13, 2018, from <https://line.me>.