

The Development of a Narrative Management System: Storytelling in Knowledge Management

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Abstract—This paper presents a narrative management system for organizations to capture organization's tacit knowledge through stories. The intention of capturing tacit knowledge is to address the problem that comes with the mobility of workforce in organization. Storytelling in knowledge management context is seen as a powerful management tool to communicate tacit knowledge in organization. This narrative management system is developed firstly to enable uploading of many types of knowledge sharing stories, from general to work related-specific stories and secondly, each video has comment functionality where knowledge users can post comments to other knowledge users. The narrative management system allows the stories to browse, search and view by the users. In the system, stories are stored in a video repository. Stories that were produced from this framework will improve learning, knowledge transfer facilitation and tacit knowledge quality in an organization.

Keywords—Knowledge Management, Storytelling, Stories, Tacit Knowledge

I. INTRODUCTION

Malaysian corporations are serious in considering knowledge management and starting to initiate their own knowledge management programs. A number of local institutions and government-linked companies are known to have set-up KM initiatives, including Multimedia Development Corporation (MDC), MIMOS, INTAN, MAMPU, MINT, SIRIM, Khazanah Nasional, Telekom Malaysia (TM), TM R&D, Tenaga Nasional Berhad (TNB) and Petronas Carigali. In the private sector, pioneers include rotasco, SpeedToyz, Cosmos Electronic, Sunway City and ASEAN Bintulu Fertiliser [1]. Organizations have strongly focused on organising creating, transferring, searching, sharing Knowledge under the roof so-called Knowledge Management [2]. These organizations have realized the importance of knowledge in order to remain competitive in the business world. Private sectors have gain benefits such as improve business process, increase customer service and enhancing customer satisfaction.

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Although the private sector organisations have enjoyed the benefits of knowledge management, there are still opportunities for the public sector to experience the same as the private sectors. In this new economy, knowledge and expertise of employees need to be seen as a critical strategic resource [3] and organisations need to explore ways in retaining them [4].

Generally, capturing tacit knowledge is one of its challenges [5]. Since tacit knowledge exists in the minds of the employees, it is easily lost as employees are transferred or retired which they take away with them years of knowledge that has not been captured [6]. In order to address this problem, tacit knowledge need to be captured. Such attempts have been made. For example Hewlett Packard (HP) Corporate Education Division has adopted this practice which all manner tips and tricks of the trade and other forms of tacit knowledge were captured and being placed within a Lotus Notes database, thereby it is available to new trainers [7]. In Malaysia, Petroleum Management Unit (PMU), the similar method has been taken as well, in which all staffs that are getting required or transferred to other organizations are compulsory to join the session known as Expert Interview session where they can share their working experiences and knowledge that they have via stories.

All this methods are good practice since organizations can capture tacit knowledge before it been taken to other places. Tacit knowledge can be transferred through highly interactive conversation shared experience, brainstorming, storytelling and freedom to express fully formed ideas [8, 9]. With this regard, storytelling is seen as one of the ways to capture tacit knowledge.

Storytelling is a powerful tool in knowledge capturing as storytelling is a natural and direct behaviour. Stories provide a bridge between the tacit and the explicit form of knowledge as stories conveys the speaker's moral attitude [10]. Furthermore, stories are used in registering real and contextualized way or work [5]. Stories in the form of narratives, metaphors and speaking figuratively allows employees to put together what they know in new ways and begin to express what they know but cannot say[11].

Stories are a form of narrative [12]-[13] but not all narrative are good knowledge sharing stories [13]-[14]. While storytelling in knowledge management context is seen as a powerful management tool to communicate tacit knowledge in organization however, it is less explored [15].

The problems that organizations encounter are that the stories are circulated but are not captured. There was a study that proposed a storytelling conceptual framework that captures stories from the experts [16]. The framework consists of components such as Outcome, Narrative Management System, Process, Roles and the Stories itself. According to [16], the narrative management system allows the stories to be uploaded into a video repository. The users are able to browse, search and view organization stories.

This study focuses on the narrative management system framework proposed by [16]. This paper presents the development Narrative Management System (NMS) that captures employees' tacit knowledge through stories. In this paper, the prototype development of the NMS is presented which it includes its analysis models and process models.

II. STORYTELLING

Storytelling is an ancient and traditional way of passing on complex and multidimensional information and ideas through narrative [13]. It exists in many domains and in many forms. From an artistic point of view, storytelling is the art of using language, vocalization, and/or physical movement and gesture to reveal the elements and images of a story to a specific, live audience. A central, unique aspect of storytelling is its reliance on the audience to develop specific visual imagery and detail to complete and co-create the story [17].

Organisational story is defined as a detailed narrative of past management actions, employee interactions, or other intra- or extra-organisational events [18]. Storytelling is defined as orally communicating ideas, beliefs, personal stories and life-lessons [19]. This definition reflects the tacit knowledge that only resides in the head of an individual. Storytelling is considered as an old skill but in a new context: Knowledge Management (KM) [20]. Storytelling in knowledge management is used as a technique to describe complex issues, explain events, understand difficult changes, present other perspectives, make connections and communicate experience. Storytelling can be used in the organizations to facilitate the start of knowledge transfer process and to transfer tacit knowledge [21]. A great deal of research and literature has been dedicated to the role that storytelling plays in effective knowledge transfer. This can be seen from the work on the role of stories among disparate project members [22]-[23], the role of stories in representing tacit knowledge [24] and also the tools used to create and construct organisational stories [5] and [25]-[26].

III. STORYTELLING APPLICATIONS

Related work in storytelling application describes how stories are constructed. Therefore, it lacks the bird-eye view of the actual application. The stories captured are either in written form or video form and have many purposes. Nevertheless, the common element among these

applications is portrayal of the beauty of storytelling in providing context, emotions, sincerity and honesty to the knowledge. Each of the storytelling applications presented in this section has its own strengths and weaknesses. TellStory [5] and StoryMapper [27] for instance, focuses on their techniques in story creation. Reference [28] presented how stories are captured through the storytelling application called The Well.

IV. NARRATIVE MANAGEMENT SYSTEM DEVELOPMENT

It is a missed opportunity for organizations to allow their stories to be circulated but not captured. There also organizations such as Coca Cola, Crocs, Google, Xerox and Kodak that use blogs as a platform to share their organization stories. Video sharing website such as Youtube is also a platform for organizations to share their stories through videos. Apart from presenting the latest products, Crocs, the famous designer, manufacturer and retailer of footwear, use Youtube to present stories from customers about the product. These companies use social websites to present stories that are targeted for their customers, which in the end of the day, to boast sales. There are also internal corporate blogs which is used by employees within the corporate network. One of the purpose of this blog is to share knowledge among its employees. In Malaysia, companies such as AirAsia, Malaysian Airlines and Tenaga Nasional Berhad have their own corporate blogs. However, not many Malaysian companies use corporate videos as a means to share stories for knowledge sharing. AirAsia has their own Youtube account called AmazingAirAsia targeted for their customers. Petronas Management Unit (PMU), use videos to show interviews conducted with experts on their experience on the job.

Narrative management system can be regarded as an extension of an expert interview system, known as K-Tube. The K-Tube contains expert interviews, knowledge sharing videos and lessons learnt artifacts. The expert interviews particularly are stories told by experts about their experience on the job or new methods and techniques that they have used in solving a problem. Apart from having the video stories, the system also provides transcript and power points or notes slides to be downloaded by the users. K-Tube is lacking of threaded discussions where users can communicate and discuss with each other.

The extension can be looked in two ways. Firstly, the narrative management system uploads many types of knowledge sharing stories, from general to work related-specific stories and secondly, each video has comment functionality where knowledge users can post comments to other knowledge users. The narrative management system allows the stories to browse, search and view by the users. Users will have options to browse general organization stories or project-related stories. In the system, stories are stored in a video repository. Stories that were produced

from this framework will improve learning, knowledge transfer facilitation and tacit knowledge quality.

Narrative management system is developed using a prototyping approach. This approach allows the system to be developed in an iterative way. Analysis, design and development of the system development phases are performed in a cycle. After a cycle is completed, the prototype will be handed over to the users for further refinement. After feedbacks from the users, the prototype will go through another cycle run until the prototype turned into a finished product.

Object-oriented approach is used in the analysis and design of NMS. Fig. 1 shows the use case diagram of the system.

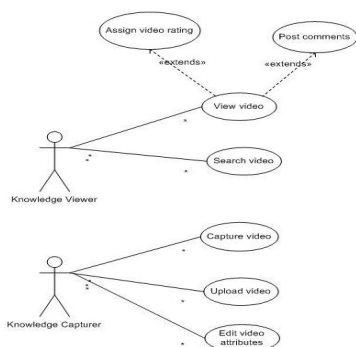


Fig. 1 Use Case Diagram of NMS

The use case diagram consists of five use cases namely View video, Search video, Capture video, Upload video and Edit video attributes. The actor Knowledge viewer (KV) is regarded as the user of the system. The actor Knowledge capturer (KC) is regarded as the administrator of the system. KC captures the video stories and uploads the videos into the system. The upload of the video requires the KC to specify the attribute of the video.

Fig. 2 shows the class diagram of NMS. The class diagram shows the object structure of NMS, the object classes and its relationship.

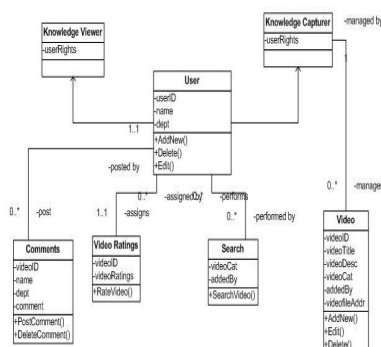


Fig. 2 Class Diagram of NMS

In NMS, users need to have a username and a password to login. KC role is two-fold. Firstly, KC performs

administrative duties such as registering, deleting and managing users. The second role of KC is to upload the videos, specify the attributes of the video such as video ID, title, description, category, the user who added the video and the video file address. As the user of the system, KV can search the video the video based on categories or users who uploaded them. KV can assign video ratings to a video and post comments after viewing the video.

Fig. 3 shows screenshot of the main page play video page.



Fig. 3 NMS Main Page

The main page contains latest uploaded videos, a description of NMS, links and a search text box. Users can search the videos stored by using either the basic search function or advanced search function. Advanced search function enable users to browse the videos based criteria such as video name, video category and by name of people who added the videos.

Users view videos on the Play video page. The videos are in FLV format therefore the page contains an embedded flash video player. If a user does not have the embedded player, a message will prompts the user to download and install latest Flash player onto their computers. Users comment and assign video ratings on this page. Other information that will be displayed in Play video page is the video description, related videos, current ratings and comments posted by other users.

V.SYSTEM WALKTHROUGH AND EVALUATION

In the course of system development, system walkthrough and evaluation was constantly conducted with group five users selected from a department of an oil and gas company in Malaysia. The domain is chosen because the department already has an expert interview system. Therefore the users are quite familiar with the features of such system, so they are in position to compare and contrast the both systems.

The purpose of this system walkthrough and system evaluation is to test the user interface and to get early validation of design decisions from the target users through additional feedbacks and comments from the potential end users. In addition, this session confirms functions are designed according to specifications and to confirm the workability of system functions and functions. Some of the

feedbacks from the system walkthrough and system evaluation are presented in Table I.

TABLE I
 USER FEEDBACKS OF NMS

| Limitation | Comments |
|---|--|
| When the video is played and the users want to post comment, the video will be interrupted. | Users can post comments while the video is playing. |
| Search function is not really powerful. | Tagging function should be added, which make the function become powerful. |
| | Users should be able to download the videos. |

VI. CONCLUSION

Storytelling has become an instrument in Knowledge Management to capture and transfer knowledge within organizations. In this system, the emphasis is on organization stories therefore the first task is to video record the stories. Stories come from the employees of the organization in the form of lessons learnt, expert interview, experience learning and others. These stories are then uploaded by the knowledge capturer. Normal users can search, view and comment the stories. The comment feature in this system has a number of advantages. Firstly, it allows users to communicate with each other and subsequently building a new version of the video story. In this perspective, despite videos have been uploaded, the stories are still constantly being build. Secondly, the comments allow story gaps to be filled. There is a possibility that a story contains 'plot hole' which requires the listeners to fill up the gaps in order to make sense out of the story. The functional requirements of the Narrative Management System are completed however, this system is still a prototype. There are other features that are required in the system. Among the features that need to be included and improved are powerful search engine (tagging), displays the video script beside the playing video and also the comment need to be archived for further review. After the additional features have been included, a proper user testing will be conducted to ensure its practicality in the organization. These additional features and user testing are our future work in Narrative System Development

REFERENCES

- [1] N. Chowdury, "Building KM in Malaysia," *Inside Knowledge*, vol. 9, April. 2006.
- [2] P. Hildreth and C. Kimble. (2002, The duality of knowledge. *Information Research* 8(1), Available: <http://InformationR.net/ir/8-1/paper142.html>
- [3] S. Bender and A. Fish, "The transfer of knowledge and the retention of expertise: the continuing need for global assignments," *Journal of Knowledge Management*, vol. 4, pp. 125-137, 2000.
- [4] C. Joe and P. Yoong, "Harnessing the Expert Knowledge of Older Workers: Issues and Challenges," *Journal of Information & Knowledge Management (JIKM)*, vol. 05, pp. 63-72, 2006.
- [5] F. M. Santoro and P. Brezillon, "Group storytelling approach to collect contextualized shared knowledge," in *Proceedings. Sixteenth International Workshop on Database and Expert Systems Applications*, 2005, 2005, pp. 388-392.
- [6] J. Johannessen, B. Olsen and J. Olaisen, "Organizing for Innovation," *Long Range Planning*, vol. 30, pp. 96-109, February. 1997.
- [7] T. H. Davenport and L. Prusak, *Working Knowledge: How Organizations Manage what they Know*. Harvard Business School Press, 1998,
- [8] M. H. Zack, "Managing Codified Knowledge," *Sloan Manage. Rev.*, vol. 40, pp. 45-58, Summer. 1999.
- [9] J. S. Brown and P. Duguid, "Mysteries of the region: Knowledge dynamics in silicon valley," in *The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship* C. Lee, W. Miller, M. G. Hancock and H. S. Rowen, Eds. California: Stanford University Press, 2000,
- [10] C. Linde, "Narrative and social tacit knowledge," *Journal of Knowledge Management*, vol. 5, pp. 160-170, 2001.
- [11] C. Davidson and P. Voss, *Knowledge Management: An Introduction to Creating Competitive Advantage from Intellectual Capital*. Auckland: Tandem Press, 2002,
- [12] Y. Gabriel, *Storytelling in Organizations: Facts, Fictions, and Fantasies*. London: Oxford University Press, 2000,
- [13] D. Sole, "Sharing Knowledge Through Storytelling," vol. 2007, March 7, 2002. 2002.
- [14] R. Ruggles. (2002, February 20, 2002). The role of stories in knowledge management. *Journal of Storytelling and Business Excellence* pp. January 11, 2007. Available: http://www.providersedge.com/docs/km_articles/The_Role_of_Stories_in_KM.pdf
- [15] Haghirian, P. and Chini, T. C., "Storytelling: Transferring tacit corporate knowledge in different cultures," in *Proceedings of EURAM (European Academy Management) Conference*, 2002,
- [16] K. S. Kalid and A. K. Mahmood, "A proposed organization storytelling conceptual framework for the purpose of transferring tacit knowledge " in *Information Technology*, 2008. *ITSim 2008. International Symposium on Information Technology*, 2008, pp. 1-8.
- [17] National Storytelling Association, "What is Storytelling?" vol. 2008, 1997.
- [18] W. Swap, D. Leonard, M. Shields and L. Abrams, "Using Mentoring and Storytelling to Transfer Knowledge in the Workplace," *Journal of Management Information Systems*, vol. 18, pp. 95-114, 2001.
- [19] R. Groce, "An Experiential Study of Elementary Teachers with the Storytelling Process: Interdisciplinary Benefits Associated with Teacher Training and Classroom Integration," *Reading Improvement*, vol. 41, 2004.
- [20] D. Snowden, "Storytelling: An Old Skill in a New Context," *Business Information Review*, vol. 16, pp. 30-37, 1999.
- [21] E. Wende, T. Philip and S. Dubberke, "Storytelling – an instrument to bolster knowledge transfer in offshore software projects," in *Third Global Sourcing Workshop*, 2009,
- [22] L. Nielsen and S. Madsen, "Storytelling as method for sharing knowledge across IT projects," in *Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06)* 2006, pp. 191a.
- [23] M. MacLeod and E. Davidson, "Organizational Storytelling and Technology Innovation," *Hawaii International Conference on System Sciences*, vol. 0, pp. 248, 2007.
- [24] S. M. LeBlanc and J. Hogg, "Storytelling in Knowledge Management: An Effective Tool for Uncovering Tacit Knowledge," vol. 2007, 2006.
- [25] P. Appan, H. Sundaram and D. Birchfield, "Communicating everyday experiences," in *Proceedings of the 1st ACM Workshop on Story Representation, Mechanism and Context*, 1999, pp. 17-24.
- [26] E. Bradner, W. A. Kellogg and T. Erickson, "The adoption and use of BATTLE: A field study of chat in the workplace," in *Proceedings of the Sixth European Conference on Computer Supported Cooperative Work*, 1999, pp. 139-158.
- [27] C. E. Acosta, C. A. Collazos, L. A. Guerrero, J. A. Pino, H. A. Neyem and O. Motelet, "StoryMapper: A Multimedia Tool to Externalize Knowledge," *Chilean Computer Science Society, International Conference of the*, vol. 0, pp. 133-140, 2004.

- [28] C. Katzeff and V. Ware, "Video storytelling as mediation of organizational learning," in *NordiCHI '06: Proceedings of the 4th Nordic Conference on Human-Computer Interaction, 2006*, pp. 311-320.