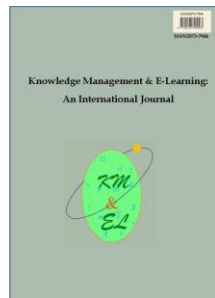


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### **Storytelling for project knowledge management across the project life cycle**

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## **Storytelling for project knowledge management across the project life cycle**

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**Abstract:** Project organizations face the problems to manage knowledge embedded in various projects because of the uniqueness and short-term orientation of most projects. Therefore, project knowledge management is regarded as an important approach to building competitive advantages. This paper aimed to examine the application of storytelling as an effective and inexpensive mechanism for managing project knowledge. The study was conducted with the project management office from the Tax Administration and Reform Automation (TARA) program in Iran. A questionnaire survey was used to analyze the storytelling applications in the projects of the TARA program. Based on the result, a conceptual framework of storytelling was proposed for integration into the project management lifecycle.

**Keywords:** Knowledge management; Story; Storytelling; Project management; Project life cycle

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### **1. Introduction**

Identification of vital knowledge from previous projects for reuse in future projects is critical for many project organizations (Kasvi, Vartiainen, & Hailikari, 2003). If the organizations retain such knowledge and experience, they could save considerable costs

resulting from redundant work and repetition of mistakes. However, the risk of a knowledge loss at a project's end is a serious problem for these organizations (Schindler & Eppler, 2003). There are many sorts of mechanisms to overcome this problem to contribute to knowledge capture, sharing, transfer and reuse (De Long & Davenport, 2003). Davenport and Prusak (1998) claimed that a convincing story is the most efficient way of knowledge transfer. Storytelling as a mechanism for extracting knowledge can be a helpful tool to attain the valuable tacit knowledge within a project team on an ongoing basis and with low cost (Haghirian & Chini, 2002). It can convey complicated messages with far greater penetration than other methods of communication (O'Gorman & Gillespie, 2010). Although several articles and publications have looked into learning and transferring project experiences (De Long & Davenport, 2003; Kasvi, Vartiainen, & Hailikari, 2003; Schindler & Eppler, 2003; Ruuska & Vartiainen, 2005), the application of storytelling in the life cycle of a project has not been investigated in the literature. This study presents a conceptual framework of storytelling and integrates it into the project management lifecycle.

## **2. Background**

### *2.1. Storytelling*

The root of the English word story is found in Latin and Greek words for knowing, knowledge and wisdom, and the words narrate and narrative have the same meaning (Ferneley & Sobreperez, 2009). Ever since human beings have communicated and socially interacted with each other, stories have played a vital role in exchanging and disclosing knowledge. In every culture, different stories exist and have been used to preserve and pass on knowledge from generation to generation (Wende & Haghirian, 2009). So it can be said that storytelling has always played a role in the evolution and survival of cultures and has provided access to wisdom of the past. Stories are the handbooks of how to behave. Through stories, everyone can see who he has been and envision who he may become (Benjamin, 2006). Therefore one of the greatest sources of stories is individual experience (Harris & Barnes, 2006). A number of story definitions are presented in Table 1.

The knowledge to be sent needs a format that can be understood by the receiver. Lately, much emphasis has been placed on stories as a mechanism for organizational knowledge management (Wende & Haghirian, 2009). Stories emerge as a natural part in everyday organizational life and develop from its events, successes and failures (Wende & Haghirian, 2009). As a company's history is accumulated, part of it is chronicled in stories (James & Minnis, 2004). They penetrate organizations and tap into the emotions of employees for inspiring action and understanding (O'Gorman & Gillespie, 2010).

According to Denning (2006), storytelling is a tool to achieve business purposes. Stories about the company, managers and employees are told to new employees to portray principal values and norms for them (Daft, 1999). Organizational story is a detailed narrative of past management actions, employee interactions, or other intra- or extra-organizational events or report about company related incidents that happened in the past and that have a special meaning for the company (Wende & Haghirian, 2009). These stories are usually communicated both informal and formal methods. The most formal method of storytelling in organizations is the case study (Benjamin, 2006). Written and spoken experiences of employees in social, psychological and cultural context, in which the organization operates, are part of the organizational stories

(Bhardwaj & Monnin, 2006). However, one of the benefits of stories is their flexibility and handiness (Sole & Wilson, 2002). A story creates an indelible message (Harris & Barnes, 2006).

**Table 1**  
Definitions of story from researchers’ perspective

Author(s)	Definitions of Story
Boje (1995)	Stories discipline by defining characters, sequencing plots, and scripting actions for interpreting past or anticipated experience.
Dickman (2003)	Stories are facts wrapped in an emotion that can compel us to take action and so transform the world around us.
Schwartz (1996) Zeelen, Wijbenga, Vintges, and Jong (2010)	Stories are an old way of organizing knowledge. Stories are a form of edutainment: education enriched with entertainment.
Cupitt (1991)	Stories are interpretative resources, models and scenarios through which we make sense of what are happening to us and frame our action.
Greenhalgh (2009)	Stories are the smallest unity by which human beings communicate their experience and knowledge of the world.

O’Gorman and Gillespie (2010) observed that stories are not a pleasant embellishment; rather, they are a vital resource for getting the right things done and they provide another form of institutional knowledge. Denning (2006) claimed that the art of performing a story to achieve a business result is however quite different from telling a story for the purposes of entertainment. Stories go beyond what did happen to imply what should happen (Feldman, 1990). Storytelling becomes especially prominent in turbulent environments such as technological change when stories and storytelling are often used to adapt with the dynamics of change and learn the new ways (Law, 2009).

Stories about winning innovations help inspire employees to create new ideas. Salesmen are trained to use narratives to explain the advantages of using their products to customers (James & Minnis, 2004). Douglas Holt, the L’Oreal Chair of Marketing at Oxford University, said Customers buy the product to experience stories. The product is simply a conduit through which customers can experience the stories that the brand tells. An effective cultural strategy creates a storied product that has distinctive branded features through which customers experience identity myths (Denning, 2006).

Harris and Barnes (2006) believed that storytelling can be used as an effective tool for leadership. Some common themes for leadership stories include mistakes and failures, choices and consequences, risk and reward, lessons learned and etc. Based on the literature, the purposes of storytelling are summarized in Table 2.

**Table 2**  
Purposes of storytelling

<b>Purpose of Storytelling</b>	<b>Author(s)</b>
<b>Spark Action</b>	Dickman (2003), James & Minnis (2004), Denning (2006), Harris & Barnes (2006), Wende & Haghirian (2009), O’Gorman & Gillespie (2010)
<b>Define Ourselves</b>	Srinivasan (2004), Harris & Barnes (2006), Denning (2006), Sax (2006), Hansen (2011)
<b>Transmit Value</b>	Vendola (1998), Sole & Wilson (2002), James & Minnis (2004), Srinivasan (2004), Denning (2006), Noi et al. (2007), Tobin & Snyman (2008), Wende & Haghirian (2009), O’Gorman & Gillespie (2010), Marshall & Adamic (2010), Hansen (2011), Haigh & Hardy (2011)
<b>Introduce Firm and its Branding</b>	Amtoft (1994), Vendola(1998), James & Minnis (2004), Denning (2006), Boal & Schultz (2007), O’Gorman & Gillespie (2010)
<b>Foster Collaboration</b>	Boyce (1996), Sole & Wilson (2002), James & Minnis (2004), Denning (2006), Adamson et al. (2006), Boal & Schultz (2007), Tobin & Snyman (2008), Wende & Haghirian (2009), Law (2009), O’Gorman & Gillespie (2010), Ann & Carr (2011), Hansen (2011), Haigh & Hardy (2011)
<b>Share Knowledge</b>	Sole & Wilson (2002), De Long & Davenport (2003), James & Minnis (2004), Kirsch (2004), Denning (2006), Noi et al. (2007), Boal & Schultz (2007), Tobin & Snyman (2008), Wende & Haghirian (2009), Brown et al. (2009), Law (2009), Sims et al. (2009), O’Gorman & Gillespie (2010), Hansen (2011), Haigh & Hardy (2011)
<b>Train Future Leaders</b>	James & Minnis (2004), Denning (2006), Ann & Carr (2011)
<b>Manage Changes</b>	Boyce (1996), Sole & Wilson (2002), Dickman (2003), James & Minnis (2004), Boddy & Patton (2004), Kirsch (2004), Boal & Schultz (2007), Tobin & Snyman (2008), Brown et al. (2009), Law (2009), O’Gorman & Gillespie (2010)
<b>Develop Trust</b>	Sole & Wilson (2002), Harris & Barnes (2006), Wende & Haghirian (2009), O’Gorman & Gillespie (2010), Haigh & Hardy (2011)
<b>Make Sense</b>	Boyce (1996), Sole & Wilson (2002), James & Minnis (2004), Kirsch (2004), Adamson et al. (2006), Bhardwaj & Monnin (2006), Noi et al. (2007), Boal & Schultz (2007), Tobin & Snyman (2008), Wende & Haghirian (2009), Brown et al. (2009), Law (2009), Ferneley & Sobreperéz (2009), O’Gorman & Gillespie (2010), Haigh & Hardy (2011), Hansen (2011)
<b>Improve Interactions</b>	Srinivasan (2004), Harris & Barnes (2006), Noi et al. (2007), Tobin & Snyman (2008), Wende & Haghirian (2009), Ann & Carr (2011), Haigh & Hardy (2011)
<b>Analyze Past Actions</b>	Bujold (2004), Sax (2006), Boal & Schultz (2007), Tobin & Snyman (2008), Bartel & Garud (2009).
<b>Identify Challenges/ Opportunities</b>	Harris & Barnes (2006), Brown et al. (2009), Law (2009), O’Gorman & Gillespie (2010)
<b>Plan Strategically</b>	Boyce (1996), Bujold (2004), James & Minnis (2004), Benjamin (2006), Sax (2006), Noi et al. (2007), Boal & Schultz (2007), Tobin & Snyman (2008), Wende & Haghirian (2009), Law (2009), O’Gorman & Gillespie (2010), Hansen (2011)

<b>Facilitate Training and Learning</b>	Boyce (1996), Sole & Wilson (2002), De Long & Davenport (2003), Srinivasan (2004), Kirsch (2004), Harris & Barnes (2006), Benjamin (2006), Noi et al. (2007), Boal & Schultz (2007), Tobin & Snyman (2008), Sims et al. (2009), Brown et al. (2009), Law (2009), Zeelen et al. (2010), O’Gorman & Gillespie (2010), Haigh & Hardy (2011)
<b>Cultivate Innovation</b>	Boyce (1996), Sole & Wilson (2002), Bujold (2004), James & Minnis (2004), Harris & Barnes (2006), Gartner (2007), Tobin & Snyman (2008), Bartel & Garud (2009), Wende & Haghirian (2009), O’Gorman & Gillespie (2010)
<b>Develop Market</b>	James & Minnis (2004), O’Gorman & Gillespie (2010)
<b>Promote entrepreneurship</b>	Gartner (2007)
<b>Tame Rumors</b>	Denning (2006)

### 2.2. Project management

Project Management Body of Knowledge (PMBOK) is a standard which identifies a subset of knowledge generally recognized as good practice for project management. It defines project management as well as associated concepts. A project is one of the dominating modes of international business today. Companies interact with their customers in projects for a certain period (Sofianti, Suryadi, Govindaraju, & Prihartono, 2013). According to the PMBOK Guide, a project is a temporary endeavor undertaken to create a unique product, service or outcome. Project management is the application of knowledge, skills, tools, and techniques for project activities to meet the project requirements. In mature project management organizations, project management exists in broader context governed by program management and a program is a group of related projects managed in coordinated way (PMI, 2008).

Project life cycle is a set of logical steps and phases, which defines, prepares and delivers product of the project (Marchewka, 2009). These steps contain initiating, planning, executing, monitoring and controlling and closing (PMI, 2008).

### 2.3. Storytelling and project management

Munk-Madsen and Andersen (2006) believed that the project stories enhance the chances of projects for success. According to Amtoft (1994), all projects are surrounded by one or more stories, just like many other products of human activity. The story of the project provides meaning to the present situation of the project as well as some clues to its future. Project stories contain beneficial information about various formal and informal expectations of the project, which are often known as a source of problems. Controlling the expectations and creation of alignment with project goals are the main purposes of these stories. Many truths and answers are hidden in old stories, which may explain why the project looks the way it currently does. Stories thus create an idea about whether the project is on the right track and also about the changes in expectations and needs during different courses of the project. It is shown that a lot of energy is relieved in the storytelling process, as the stories answer many unanswered questions in the project. All these various stories form a part of the project basis which has been largely overlooked until now.

Stories crystallize common values and beliefs. They build stronger teams and a stronger sense of community. Stories invite employees to bring the whole person to work (both heart and head), and so elicit much more comprehensive perspectives and meaningful commitments. They create a field for work aspirations and thus make each employee feel more valued. Project managers can relate stories for introducing themselves to a new team, orienting new people to team or organization, starting a meeting about a difficult issue, disclosing a failure, encouraging openness (Harris & Barnes, 2006), calming employees during a crisis, solving problems, making decision and etc., (James & Minnis, 2004). So the project managers must actively take part in producing an official and credible story which minimizes the possibilities of misinterpretation (Amtoft, 1994).

In short, stories have the potential to revitalize the way of business projects (Adamson, Pine, Steenhoven, & Kroupa, 2006). When a project is finished, a common story should be constructed and told to everyone with an influence on future of the company. Table 3 summarizes the purposes of storytelling in project management.

**Table 3**  
Purposes of storytelling in a project

Author(s)	Purposes of storytelling in a project
Amtoft (1994)	Provide information about the present and future of the project Reduce false perceptions of the project Create a shared vision among team members and stakeholders Provide ideas for future actions
Vendola (1998)	Convince customers about products Express expectations about product delivery time and its function Generalize past failures experiences for present projects success Improve project reputation
Nielsen and Madsen (2005)	Establish identity Documentation of knowledge and experience Group knowledge sharing at post project reflection meeting Understand and legitimizing of change Improve social negotiation Better understanding from daily interactions Show deviations from accepted social action Facilitate analysis of IT requirements
Ricketts, Shanteau, McSpadden, and Fernandez-Medina (2010)	Improve train and increasing knowledge Simulate hazardous situations Improve decision making and receive feedback about decisions

#### 2.4. Research gap

While storytelling was investigated as an effective mechanism for knowledge management of projects, there are a few studies examining the application of storytelling

in project contexts. Amtoft (1994) introduced storytelling as a means of supporting project management. However, he attributed the most role of story to creating a common understanding between project team and stakeholders. Vendola (1998) noticed the use of stories to communicate with project customers, understand their expectations, transfer values, and learn from failure experiences. Boddy and Paton (2004) provided project managers with some recommendations on using stories in change management and influencing stakeholders. Nielsen and Madsen (2005) suggested using stories in change management and requirement analysis to some extent. They considered the role of storytelling in post-project evaluation and knowledge sharing, but limited to few cases with a focus on project plan in the story. Therefore, to the best of our knowledge, there lack a comprehensive study to explain the role of storytelling throughout the life cycle of the project.

### 3. Research method

This study was conducted with the project management office of the Tax Administration and Reform Automation (TARA) program in Iran. The main goal of the TARA program is the design and development of an Integrated Tax System, the most important national software systems in Iran, for improving the existing tax administration and collection process, as well as for implementing a fully integrated technology solution to manage taxpayer information and automate manual processes. The TARA program includes unique and complex projects, and storytelling are applied to transfer knowledge in the various phases of these projects.

The storytelling applications in these projects were extracted by a survey questionnaire comprised of 58 questions, which was designed based on 5-point Likert scale and validated by the experts. The data were collected from 31 project managers and experts working in the project management office. 22 participants completed the questionnaire and the return rate was 71%. Finally, a conceptual framework was designed for storytelling applications in projects management life cycle of the TARA program.

### 4. Data analysis

58 storytelling applications were identified based on the literature and the questionnaire was designed accordingly to examine storytelling applications in the project life cycle of the TRRA program. The questionnaire was delivered to 5 experts to determine the validity.

After verifying the validity, the questionnaire was distributed in the project management office of the TARA program. As the data were gathered from less than 30 participants, the binomial test was used for data analysis and the Friedman test for ranking the results.

Results of the binomial test on data revealed that among the 58 storytelling applications, just 38 of them were used in the projects of this program (Table 4).

**Table 4**  
Results of the binomial test arranged using the Friedman test

No.	Application	Process	Score	No.	Application	Process	Score
1	Share and exchange project experiences	Close project	25.05	20	Foster project team	Develop project team	19.32



2	Define risks and problems	Plan risk management	24.11	21	Advance project actions	Direct and manage project execution	19.14
3	Document project experiences	Close project	23.93	22	Define project actions costs	Estimate activity resources	19.05
4	Define risks and problems	Identify risks	23.41	23	Define project stakeholders requirements	Collect requirements	19.02
5	Manage change	Direct and manage project execution	23.18	24	Define project actions	Sequence activities	18.73
6	Define risks and problems	Plan risk responses	22.36	25	Define project actions	Create WBS	18.27
7	Define quality standards	Plan quality	21.84	26	Control project	Control scope	17.91
8	Document project experiences	Close procurement	21.64	27	Provide individual and collective feedbacks	Close procurement	17.89
9	Share and exchange project experiences	Close procurement	21.43	28	Analyze project performance	Report performance	17.8
10	Define risks and problems	perform qualitative risk analysis	21.16	29	Define action plans	Develop project management plan	17.7
11	Share project information	Distribute information	21.16	30	Introduce project product	Manage stakeholders expectations	17.2
12	Provide individual and collective feedbacks	Close project	20.82	31	Control project	Verify scope	17.11
13	Introduce project product	Develop project charter	20.41	32	Introduce project	Manage stakeholder expectations	17.09
14	Define project actions time	Estimate activity durations	19.98	33	Define project scope	Define scope	16.61
15	Control project	Monitor and control risks	19.86	34	Introduce project stakeholders	Identify stakeholders	16.36
16	Improve project interactions	Manage stakeholders expectations	19.77	35	Project team formation	Acquire project team	16.36
17	Introduce project	Develop project charter	19.52	36	Overall introduction of project stakeholders	Develop project charter	16.3
18	Introduce business	Develop project charter	19.48	37	Improve project interactions	Conduct procurement	15.5
19	Analyze past performance	Distribute information	19.41	38	Introduce project stakeholders	Manage stakeholders expectations	15.11

Among the 38 storytelling applications used in this program, 12 cases were associated with the planning group, 11 cases with the executing group, 6 cases with the closing group, 5 cases with the initiating group, and just 4 cases with the monitoring and control group. Results of the Friedman test showed that there was no significant difference among the applications in terms of importance. Results of the Friedman test

showed that there was a significant difference among the applications in terms of importance. Three mostly used applications in the TARA projects were listed as the following:

- Share and exchange project experiences from close project process;
- Define risks and problems from plan risk management process;
- Document project experiences from close project process.

As a result of the data analysis, 38 storytelling applications used in the TARA program was disclosed. Accordingly, a conceptual framework was designed under five process groups of the project life cycle. It included five tables and each table had three columns, namely: processes, application of storytelling and purposes of storytelling.

#### 4.1. Initiating process group

This group consists of those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase. Storytelling applications and purposes in this group, which were used in the TARA program, are presented in Table 5.

**Table 5**  
Applications and purposes of storytelling in the initiating process group

Processes	Applications	Purposes
Develop project charter	Introduce business	<ul style="list-style-type: none"> <li>- Understand principles and characteristics of business</li> <li>- Show mission, vision, goals and strategies of the organization</li> <li>- Understand organizational environment and structure.</li> <li>- Understand organization past</li> </ul>
	Introduce project	<ul style="list-style-type: none"> <li>- Describe project and its goals</li> <li>- Identify and understand project challenges and opportunities</li> <li>- Show project achievements</li> </ul>
	Introduce project product	<ul style="list-style-type: none"> <li>- Generate ideas for definition of product features</li> <li>- Describe expectations from product capabilities</li> </ul>
	Overall introduction of project stakeholders	<ul style="list-style-type: none"> <li>- Introduce the project primary stakeholders</li> <li>- Understand the overall needs of stakeholders</li> </ul>
Identify stakeholders	Introduce project stakeholders	<ul style="list-style-type: none"> <li>- Introduce project stakeholders</li> <li>- Understand ideas, motivations, needs and goals of the project stakeholders</li> <li>- Communication and interaction between project stakeholders</li> <li>- Persuade investors to continue the project</li> <li>- Create alignment between stakeholder expectations and project goals</li> </ul>

#### 4.2. Planning process group

This process group consists of those processes performed to establish the total scope of the effort to define and refine objectives, and develop the course of action required to attain those objectives. Storytelling applications and purposes used in this group are presented in Table 6.

**Table 6**  
Applications and purposes of storytelling in the planning process group

Processes	Applications	Purposes
Develop project management plan	Define action plans	<ul style="list-style-type: none"> <li>- Obtain and organize information in order to create an executable program</li> <li>- Understand past for future planning</li> </ul>
Collect requirements	Define project stakeholders requirement	<ul style="list-style-type: none"> <li>- Describe the needs and official/unofficial expectations of stakeholders</li> <li>- Obtain information on project solvable issues</li> </ul>
Define scope	Define project scope	<ul style="list-style-type: none"> <li>- Detailed description and interpretation of the project and its goals</li> <li>- Detailed description of expectations about the capabilities and product delivery time</li> </ul>
Create WBS Sequence activities	Define project actions	<ul style="list-style-type: none"> <li>- Understand project actions and predict their cause and effect</li> <li>- Understand the past for future actions</li> </ul>
Estimate activity durations	Define time of project actions	<ul style="list-style-type: none"> <li>- Connect between actions and time</li> <li>- Understand the past for future actions</li> </ul>
Estimate activity resources	Define costs of project actions	<ul style="list-style-type: none"> <li>- Understand costs of change</li> <li>- Understand financial impact of project</li> <li>- Understand the past for future actions</li> </ul>
Plan quality	Define quality standards	<ul style="list-style-type: none"> <li>- Describe the needs and official/unofficial expectations of stakeholders</li> <li>- Support continuous improvement initiatives</li> <li>- Understand the past for future actions</li> </ul>
Plan risk management Identify risks perform qualitative risk analysis	Define risks and problems	<ul style="list-style-type: none"> <li>- Identify project challenges and opportunities</li> <li>- Understand emergency and ambiguous situations</li> <li>- Simulate hazardous situations</li> </ul>
Plan risk responses		<ul style="list-style-type: none"> <li>- Recognize risks</li> <li>- Understand financial impact of project</li> <li>- Generalize past failures experiences for present projects success</li> <li>- Understand the threat changes</li> <li>- Describe the needs and project expectations</li> </ul>
Plan procurement	Analyze past performance	<ul style="list-style-type: none"> <li>- Evaluation of past cooperation with suppliers</li> </ul>

4.3. Planning process group

This group consists of those processes performed to complete the work defined in the project management plan to satisfy the project specifications. Storytelling applications and purposes used in this group are presented in Table 7.

**Table 7**  
Applications and purposes of storytelling in the executing process group

Processes	Applications	Purposes
Direct and manage project execution	Advance project actions	<ul style="list-style-type: none"> <li>- Guide decision making, problem solving and action</li> <li>- Coordinating</li> <li>- Manage personnel safety and health</li> <li>- Manage performance and improve productivity</li> </ul>
	Manage change	<ul style="list-style-type: none"> <li>- Facilitate change</li> <li>- Adapt to changing</li> </ul>
Acquire project team	Project team formation	<ul style="list-style-type: none"> <li>- Create a team for implementing plans</li> <li>- Match characteristics of individuals with job requirements</li> <li>- Explain different roles within teams</li> <li>- Create a shared vision among team members</li> <li>- Develop teamwork</li> </ul>
Develop project team	Foster project team	<ul style="list-style-type: none"> <li>- Train new employees and their socialization</li> <li>- Create a team with high coordination and create awareness about individuals, teams and their roles in the team</li> <li>- Transmit values, beliefs and project organization culture</li> <li>- Foster cooperation and understanding of teamwork</li> <li>- Develop trust, empathy, commitment and improve the morale of members</li> <li>- Encourage creative and innovative culture</li> <li>- Share knowledge and experiences</li> </ul>
Distribute information	Share project information	<ul style="list-style-type: none"> <li>- Create a proper flow of information throughout organization and project</li> </ul>
	Analyze past performance	<ul style="list-style-type: none"> <li>- Evaluation of past actions in the area of information distribution</li> </ul>
Manage stakeholder expectations	Improve project interactions	<ul style="list-style-type: none"> <li>- Improve communication between stakeholders and project managers</li> </ul>
	Introduce project	<ul style="list-style-type: none"> <li>- Describe the project and its goals</li> <li>- Show project achievement</li> </ul>
	Introduce project stakeholders	<ul style="list-style-type: none"> <li>- Describe needs and official/unofficial expectations of stakeholders</li> </ul>
	Introduce project product	<ul style="list-style-type: none"> <li>- Express expectations about product capabilities</li> </ul>
Conduct procurement	Improve project interactions	<ul style="list-style-type: none"> <li>- Negotiate with suppliers</li> </ul>

#### 4.4. Monitoring and controlling process group

This group consists of those processes required to track, review, and regulate the progress and performance of the project; identify any areas where changes to the plan are required; and initiate the corresponding changes. Storytelling applications and purposes used in this group are presented in Table 8.

**Table 8**

Applications and purposes of storytelling in the monitoring and controlling process group

Processes	Applications	Purposes
Monitor and control risks	Control project	<ul style="list-style-type: none"> <li>- Improve social control</li> <li>- Create feedback loops</li> <li>- Track performance</li> <li>- Evaluation actions quality</li> <li>- Support continuous improvement initiatives</li> <li>- Facilitate change and improve things</li> <li>- Prevent project diversion from its objectives</li> </ul>
Verify scope Control scope	Control project	<ul style="list-style-type: none"> <li>- Control the expectations of stakeholders</li> </ul>
Report performance	Analyze project performance	<ul style="list-style-type: none"> <li>- Organize information and knowledge flow</li> <li>- Track performance</li> </ul>

#### 4.5. Closing process group

This group consists of those processes performed to finalize all activities across all project management process groups to formally complete the project obligations. Storytelling applications and purposes used in this group are presented in Table 9.

**Table 9**

Storytelling applications and purposes in the closing process group

Processes	Applications	Purposes
Close project & Close procurement	Provide individual and collective feedbacks	- Share group knowledge
	Share and exchange project experiences	- Evaluate post project
	Document project experiences	- provide lesson learned for using on appropriate time

## 5. Conclusion

This study examined the application of storytelling as an effective and inexpensive mechanism for managing project knowledge. The study was conducted with the project management office from the TARA program. A questionnaire survey identified 38 storytelling applications in the projects. The results show that the extent of using these applications had significant difference; and the TARA program has benefitted most from the storytelling applications in three aspects, namely Share and exchange project

experiences from Close project process, Define risks and problems from Plan risk management process, Document project experiences from Close project process. Based on the results, a conceptual framework of storytelling was proposed for integration into the project management lifecycle.

Moreover, the following suggestions are offered for future studies:

- Studying the use of the storytelling applications in project-based organizations in different industries;
- Developing an algorithm for storytelling in project contexts;
- Examining the effect of false stories on the success of projects.

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