

Knowledge Repository Framework: Organisational Learning Accumulated in the Software Project Management

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Abstract: -Knowledge management is an emerging discipline that promises to capitalize on organizations' intellectual capital. This systematic review identifies empirical studies of knowledge management initiatives in software project management. If we apply KM in nutshell of SPM, create a knowledge repository which can be used at different level in the organization. It also shows most of the knowledge repositories are tangible. Tangible knowledge repositories can be easily and effectively managed by organization. This Tangible knowledge repository becomes intellectual capital to the organization. A software organization's main asset is its intellectual capital. The Model of frame work would help business managers to effectively use this knowledge repository to achieve business goals, to speed up business process and to avoid risk in the business.

Keywords: - Software Project Management (SPM), Knowledge Management (KM), Knowledge Repository (KR)

I. INTRODUCTION

A software organization's main asset is its intellectual capital. Knowledge management is an emerging discipline that promises to capitalize on organizations' intellectual capital. An organization's intellectual capital consists of *tangible* and *intangible* assets. Tangible assets, which correspond to documented, explicit knowledge, usually include manuals; directories; correspondence with (and information about) clients, vendors, and subcontractors; competitor intelligence; patents; licenses; and knowledge derived from work processes (such as proposals and project artifacts). Intangible assets, which correspond to tacit and undocumented explicit knowledge, consist of skills, experience, and knowledge of an organization's people [3]. Purpose of this research is to study how SPM nine tasks create, capture, codify, communicate and capitalize knowledge at different level of in the organization. This study focus on how the knowledge created will be converted into tangible or intangible asset in the organization. I have categorized knowledge created while software project management in different categories and Give the conceptual framework how Project knowledge is managed at four distinct levels: individual, project, organization and global.

II. KNOWLEDGE MANAGEMENT

Knowledge Management, (KM) is a concept and a term that arose approximately two decades ago, roughly in 1990. Gartner Group created definition of KM, "Knowledge management is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers" [5].

Knowledge Management Cycle:

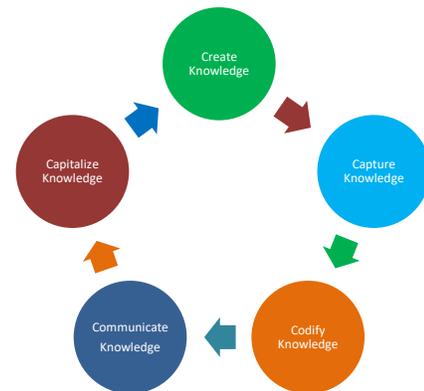


Fig : Knowledge Management Cycle

1. *Create Knowledge:* The tasks in this phase are conducting research activities in order to discover the knowledge in the organization, exploiting past experiences in the organization to discover new knowledge, creating new knowledge through the continuous learning in the organization, preparing an appropriate culture and system in order to create new knowledge in the organization [4].

2. *Capture Knowledge:* The tasks in this phase are searching for several sources of knowledge that is necessary and related for performing the work, perceiving and sensing needs and requirements of work from knowledge resources, acquiring knowledge that already exists in the organization from its appropriate sources at appropriate times where it is needed, extracting the knowledge of other people in the organization,

participation in training workshops and sessions in order to acquire more knowledge [4].

3. *Codify Knowledge*: The tasks in this phase are classification and categorization of existing knowledge in the organization according to its nature into categories such as administrative, technical, financial etc., storing knowledge in the organization in locations that are easy to retrieve, mapping knowledge in the organization so it can be easily accessed whenever needed, organizing knowledge in the organization in a way that is understandable to all organizational members [4].

4. *Communicate Knowledge* : The tasks in this phase are considering source, nature, and type of knowledge when transferring and sharing in the organization, motivating organizational members for participation in their creative and intellectual resources, providing information and communication technology in order to transfer knowledge among people in the organization , exchanging knowledge among people in the organization through documents, manuals and catalogues, accessing knowledge in the organization anywhere anytime when it is needed[4].

5. *Capitalize Knowledge*: The tasks in this phase are investing and utilizing organizational knowledge in new ways and methods of doing work, enhancing the feeling of individual responsibility towards the knowledge of the organization, application of knowledge to making creative and intellectual resources available and to improving overall performance of organization, improving the decision-making process and problem solving through application of knowledge, utilizing the knowledge that is embedded in procedures, rules, and norms in the organization in order to direct the future behavior of organizational members[4].

III. SOFTWARE PROJECT MANAGEMENT

Project management is “the application of knowledge, skills tools and techniques to project activities to meet project requirements.”

Project Management Knowledge Areas:

1. **Project Scope management** involves defining and managing all work required to complete the project successfully.
2. **Project time management** includes estimating how long it will take to complete the work, developing an acceptable project schedule, and ensuring timely completion of the project.
3. **Project cost management** consists of preparing and managing the budget for the project.
4. **Project quality management** ensures that the project will satisfy the stated or implied needs for which it was undertaken.



Fig : Project Management Task Set

5. **Project Human Resource management** is concerned with making effective use of the people involved with project.

6. **Project Communications management** involves generating, collecting, disseminating and storing project information.

7. **Project Risk management** includes identifying, analyzing and responding to risks related to the project.

8. **Project procurement management** involves acquiring or procuring goods and services for a project from outside the performing organization.

9. **Project Integration Management** involves deceiving functions that affects and is affected by all of the other knowledge areas.

IV. PROJECT KNOWLEDGE MANAGEMENT

There exist dimension of knowledge which will be called **scale**. There exist two main values on this dimension.

Micro-knowledge

Micro-knowledge is a piece of knowledge needed to perform one task or to solve a problem. For example the way of fixing software bugs of particular type make examples of such knowledge [2].

Macro-knowledge

Macro -knowledge is the total knowledge possessed by a given subject [2] .

So there are four sub-values of project macro-knowledge:

- **Individual Level knowledge:** Knowledge possessed by individual team member. For Ex. Training of a single team member in order to supply them the general knowledge needed to participate in project execution is an example of a process performed on all the knowledge possessed by an individual person.

- **Project Level knowledge:** Knowledge possessed by project team. For Ex. Completing a project team having knowledge sufficient to perform a project is an example of a PKM process performed on the project level .
- **Organization Level knowledge:** Knowledge possessed by organization. Implementing a project knowledge management system in an organization deals with all the knowledge possessed by an organization as a whole.
- **Global Level knowledge:** Knowledge possessed by the whole global community of project managers. Developing global project management bodies of knowledge is an example of a process performed on all the globally accessible project management knowledge.

V. FINDINGS

Software Organization a Knowledge Repository:

When individuals team up to solve a problem, they communicate and exchange information related to a problem solving, but for solving different problems within or outside a company, they form communities of interest. These communities heavily utilize web technology for knowledge sharing. In software development, learning occurs during projects.

Following Findings in Nutshell:

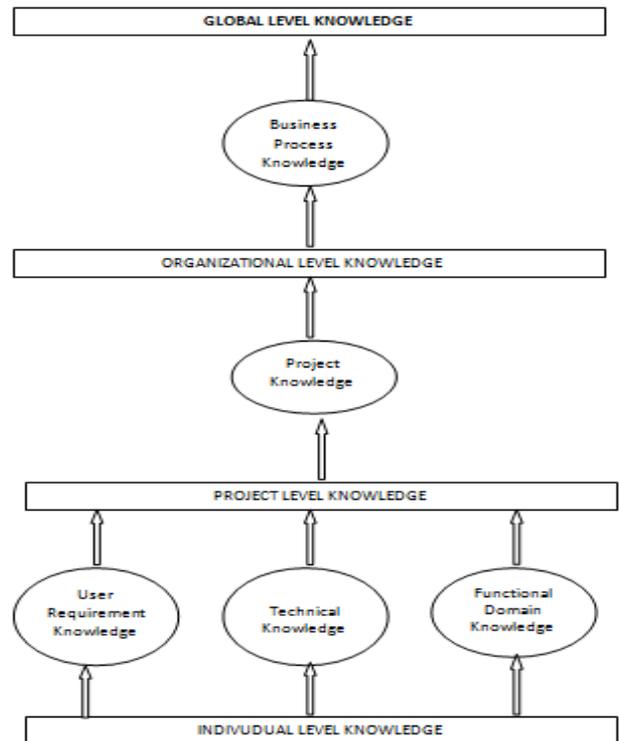
- **Business Knowledge:** Knowledge created in business activities Like Market survey, business Plans, Scope management, Feasibility study report, Customer relationship management(CRM)
- **Functional Domain Knowledge:** Knowledge created while working in domain area of an individual expertise.
- **Project Knowledge:** Knowledge created while managing project like project planning, resources planning, project assessment and quality maintenance.
- **Technical Knowledge:** Knowledge created while doing technical tasks like design, coding, testing, deploying and maintenance of the project.
- **User Requirement Knowledge:** Knowledge created while doing requirement analysis.

VI. SUGGESTIONS

- **Knowledge Repository used at different levels in the organization is suggested as bellow**

Task	Knowledge Repository	Level where Knowledge is used	Tangible / Intangible Asset
Scope management	1. Business Knowledge	Global Level Organization Level	Tangible assets
Time management	1. Business Knowledge 2. Project Knowledge	Individual Level Project Level Organizational Level	Tangible and Intangible Asset
Cost management	1. Business Knowledge	Organizational Level Global Level	Tangible Asset
Quality management	1. Technical Knowledge 2. Project Knowledge 3. User Requirement Knowledge	Individual Level Project Level Organizational Level	Tangible Asset
Human Resource management	1. Business Knowledge 2. Project Knowledge	Project Level Organizational Level	Intangible Asset
Communications management	1. Business Knowledge 2. Project Knowledge 3. User Requirement Knowledge	Individual Level Project Level Organizational Level Global Level	Tangible and Intangible Asset
Risk management	1. Business Knowledge 2. Project Knowledge 3. Technical Knowledge	Project Level Organizational Level	Tangible Asset
Procurement management	1. Business Knowledge 2. Project Knowledge	Project Level Organizational Level Global Level	Tangible Asset
Software Process Management	1. User Requirement Knowledge 2. Functional Domain Knowledge 3. Technical Knowledge	Project Level Individual Level	Tangible and Intangible Asset

- **The following Model of Framework: Showing Knowledge Repository for Organizational Learning is Suggested**



- Knowledge from all projects must be documented and collected
- This knowledge should be organized into a repository that will support decision making for future projects.
- Organization should provide resources and funds for this activity.

VII. CONCLUSION

After reviewing related articles and research papers the researcher has tried to correlate SPM process to KM process. If SPM process follows KM process in nutshell it will create huge knowledge repository. The given model of frame work shows Knowledge Repository used in organization at various levels are tangible in nature. It also shows most of the knowledge repositories are tangible. Tangible knowledge repositories can be easily and effectively managed by organization. This Tangible knowledge

repository becomes intellectual capital to the organization. A software organization's main asset is its intellectual capital. The model of frame work would help business managers to effectively use this knowledge repository to achieve business goals, to speed up business process and to avoid risk in the business.

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