



Software Management and Reuse: Knowledge Perspective

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Abstract: Software managers and users are under pressure from various sectors to provide meaningful, faster, cheaper, easy to adopt, integrated solutions, and with increasingly higher quality of software by using optimum available resources. As software management and reuse is a very knowledge intensive task, managers have been paying their attention to knowledge management and reuse as a means to improve software quality. This involves reusing, managing and developing existing varieties of tools and repositories.

Keywords: *Software Management, Software Reusability, Knowledge, Knowledge Management, Software Engineering Environments.*

I. Introduction

By the advancement of information technology, the global economy has been greatly affected by knowledge growth rate. Knowledge (and the reuse concept of knowledge) is the most important asset for organizations. Effective Knowledge Management (KM) has been not only becoming the possible solution for enterprise while it has also been becoming difficult to manage knowledge more effectively in a competitive environment. Now days it is not difficult to understand that knowledge management is not a simple process due to rapid changes are being taking place in an electronic age.

The software management and reuse allow adopting, customize, standardize and integrate reusable components based on the verifiable properties. It can be used to create a better learning environment to enhance our software systems value to its customers. Key importance is the management and reuse of software in a modern environment. That is, we want to develop and reuse software which not only provides best solutions and to resolve [1] problems while at the same time it should have sense to knowledge experts. We should realize the problem associated with software management and reuse as a continuing activities in which a quality and quantity on knowledge comes-out as adaptation to a series of processes with the concerned environment. Processed knowledge [1] emerges from several areas "such as domain theory, objects being reasoned about, workplace environment and so on" [1]. Such structure created permits [2] us for usefulness of this knowledge in software manage and reuse situations.

II. KNOWLEDGE PERSPECTIVE AND REUSABILITY

Not only is knowledge intrinsically hard to administer in a software environment what makes it even more complicated to manage are the integration, reuse and ability to share knowledge in a varying multidimensional environment. Our objective is that we like to understand about enablers and barriers for knowledge management and reuse in the industry.

Thomas Davenport and Laurence Prusak [3] presented the realistic explanation of knowledge in the institutes. According to them [3] "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knower's. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms."

One important aspect is the knowledge Accessibility [4] which means that Knowledge is extended "to points-of-action" throughout learning scheme, preparation agendas, and "automated knowledge-based systems", or specialist systems. While applying the knowledge is the final goal and it is the most important part of the knowledge management life cycle. All the activities are intended at making the knowledge available whenever it

is needed. By applying the knowledge, it is easy to get the base for the further knowledge creation, modernization and learning.

We need to generate a comprehensive knowledge model to develop and reuse software effectively. For this, It is required to analyze several knowledge management emerging problems pertaining to a modern and fast paced software environments which can ultimately evolve to integrate emerging and existing knowledge management practices, experiences and strategies so that a comprehensive model can be adopted. In addition to software environment, we can apply present methodology to some problems, e.g. sharing issues (enablers and barriers), Reuse and management of components systems.

III. REUSABILITY AND KNOWLEDGE MANAGEMENT

For any organization, the knowledge process can be formed in the four stages for example, Knowledge Creation, Knowledge Capture, Knowledge Recovery and Knowledge Use.

In Fig 1 on next page for Knowledge Process, it is shown that the contents for the Knowledge Management (KM) [4] "need to be created or converted, so that they fit the standards of the" Organization. The computer accessible [4] "knowledge can be created as formal and informal knowledge. The knowledge can also be" imported and the imported knowledge having the same or more importance as knowledge created.

After knowledge creation it is required to capture the necessary contents from the created knowledge items. The Knowledge captured should be based on the requirements of the organization.

The group of persons who worked for the knowledge is responsible for the future reuse. During such knowledge process we will get the platform for the Knowledge Reusability. The Knowledge which is formed during this process can be reused by the organization in the future for their software management or enhancement.

In the context of software management, Knowledge Management (KM) [4] "can be used to capture the knowledge and experience generated during the software process. Although every software project is unique in some sense, similar experiences can help developers and managers to enhance their activities. Reusing knowledge can prevent the repetition of past failures and guide to the solution of recurrent problems. So, to be effective, a KM system should be integrated to the software process. Since Software Engineering Environments (SEEs) integrate collections of tools supporting software engineering activities across the software lifecycle (O'Leary, D.E., Studer, R., 2002) [5], it is natural to integrate KM facilities in the SEEs".

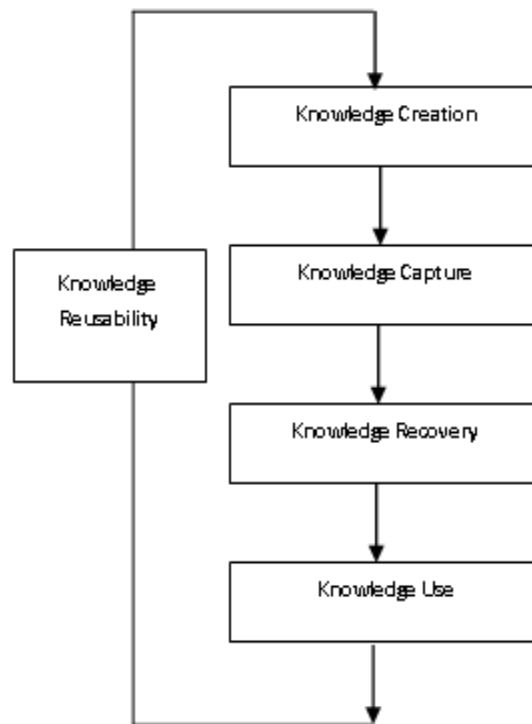
This research recommends [6] that knowledge reusability is a necessary element of any institute. Thus knowledge reusability forever improves the efficiency and superiority of knowledge in any institute unless it is developed in the correct way.

IV. KNOWLEDGE MANAGEMENT AND SOFTWARE ENGINEERING ENVIRONMENTS

We do not have a single description for knowledge management, but some authors explained that [4], "knowledge management is neither a product in itself, nor a solution that organizations can buy off-the-shelf. It is a process implemented over a period of time, which has much to do with human relationships as it does with business practices and information technology". From the knowledge management perspective it is vital to study the Knowledge Creation, Knowledge Capture, Knowledge Recovery and Knowledge Use.

Knowledge "Management [4] can also be used to support developers during the software process. Using a KM approach, knowledge created during software process can be captured, stored, disseminated, and reused, so that better quality and productivity can be achieved. Knowledge Management can be used to better support management activities".

Figure 1 Fig 1- Knowledge Process Knowledge Reusability



In any institute, knowledge depends upon the time [7] and it will always changes with time. However, we are not sure whether this change in knowledge is useful for future or not? Therefore important question is that how the usefulness of knowledge can be maximized? "Success in an increasingly competitive marketplace depends [4] critically on the quality of the knowledge, which organizations apply to their business processes. The challenge of using knowledge to create competitive advantage becomes more crucial as (O'Leary 1998) [5]: the rate of innovation is rising, so that knowledge must evolve and be assimilated at an ever faster rate and there is a need to replace the informal knowledge with formal methods aligned to organization processes".

Reuse of components not only enhances quality but at the same time also saves the huge efforts. Both software and knowledge components can be reused to evolve a cheaper solution in the contemporary environments.

However, reuse should not overcome the requirements of the systems and should be taken as quality oriented applications. Sometimes we realize that Components based reuse is required to be compromised for the integration with the existing systems, but one should also remember that this should not change the objective of the knowledge based systems.

V. CONCLUSION

Present work is expected to boost not only our idea about knowledge management and reuse in software engineering environments while it might be helpful to managers and developers to optimize their efforts and to increase the quality of software with minimum efforts. By reusing software, one will feel comfortable to manage and extend their existing software components in the intense and fast paced software engineering environments.

A. Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

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