

ANALYZATION AND EXTRACTION OF KNOWLEDGE THROUGH MODEL EVALUATION TECHNIQUES IN SPI

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ABSTRACT

It is observed that in recent years medium organizations have emerged very rapidly and thousands of such organizations are in existence all over the globe. To cater the needs of such organizations , a new field of research was created – software Engineering, which differs in numerous ways, which include the need of agile process models, extended modeling techniques , Navigational development techniques, different architectures and rapid application process along with different testing techniques. It has been observed that Software process improvement emerges as one of the biggest challenges for such companies A systematic review (SR) has been conducted to identify and discuss the existing models and techniques used by medium based organizations. Important phases of our SR included identification of the research questions to be investigated; to identify relevant literature; data extraction from selected studies; data synthesis to

formulate answers; and formal discussion to identify trends and research gaps.

The Capability Maturity Model from the SEI is a very good example for SPI attempts in Software Organizations. But the increasing number of medium sized software organizations presents new SPI Challenges. Owing to the challenges unique to such organizations, doubts arise about the feasibility of applying SPI methods like CMM. In (KDM) Knowledge Driven model to be in particular the management of both information and people in an organization is called as knowledge management ;broadly classified into 2,explicit and tacit forms of knowledge which can be expressed in the form of documents, reports, database information, and minds of individual.The paper reviews the challenges faced by the medium sized organizations and presents 2 attempts in the literature to tackle the problem of SPI in Medium Sized Organizations.

KEYWORDS: *medium scale organizations, systematic review, software process improvement, capability maturity model, knowledge driven model, Key process area.*

The Knowledge Driven Model:

In the words of Schneider & von Hunnius “Without a learning attitude and some appreciation for continuous process improvement even best repositories will not make experiences fly”, The importance and impact of Knowledge attained through learning, is felt in process improvement programs, since the improvement programs are continuous the knowledge repositories are to be continuously updated and reengineered based on the baseline requirement of project environment. It Consists of five phases of the KDM model:

- Initiating phase
- Diagnosing phase
- Establishing phase
- Acting phase
- Leveraging phase

PHASES	KDM ACTIVITIES
Initiating	Understand the need of improvement

	Establish sponsorship
	Portray improvement infrastructure
Diagnosing	Collect existing literature
	Acquire tacit Knowledge
Establishing	Package Knowledge for operation
	Implement knowledge Engineering Techniques
	Operate knowledge Management tools for DSS
Acting	Derive required knowledge for SPI planning and execution
	Characterize attribute for individual processes
Leveraging	Populate repositories and analyze information
	Acquire Explicit Knowledge

	Derive Knowledge Combinations.	Hybrid through
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Data Extraction

The purpose of the data extraction phase is to extract the relevant data, later to be used to prepare summary tables and quality scores, later to be used to answer SR's research questions. Data extraction was performed using two extraction forms created to extract the data needed to answer the SR's research questions and assesses the quality of each study. One of the forms stored the data extracted from for the qualitative study and the other stored data extracted from quantitative studies.

Data Synthesis & Results

In the data synthesis phase the results from all the findings were tabulated and summarized and each question was assessed individually against the findings. results are also useful to identify current research gaps. The sections below elaborate on the synthesis process for each research question.

Research Questions

It states that “Which software process improvement models/techniques are followed by small and medium organizations?”

In relevance to this question some studies are proposing an applicable model for software process improvement of medium organizations while others just rely on a set of models believed to be useful for the cause. Models are established paradigms to perform certain tasks with an implication regarding the order of execution Techniques exist in isolation to perform a certain activity and can be implemented inside a model. Models are more complete than techniques and also reside on a different level of complexity as they act as a framework or sometimes as a pattern based on experience.

Queries to be evaluated to find the performance of medium scale organization:

- Do your peers share their knowledge?
- Do you need an integrated framework to support you in a process?

- In which domain of process you have been into?
- Do that process need improvement?
- Are you aware CMM and KDM standards?
- What other alternate ways you would suggest for improvement of an organization?
- What is cost of a process involved in your organization?
- How could you acquire knowledge?
- How would you share the knowledge you acquired over years of experience?
- What processes would you deemed for improvement in software development?

CAPABILITY MATURITY MODELS:

The software CMM defines 5 levels and 18 Key Process Areas (KPAs). The validity of the 5 maturity levels for guiding Software Process Improvement has been exemplified by many case studies and surveys .The architecture of the CMM is comprised of a ladder with an initial level and 4 steps.

Level 1:

Level 1 characterizes a state of chaos in the environment. The success of an organization at this level is attributable only to the competency of the people involved.

Level 2:

Level 2 – called “repeatable” – implies that success can be repeated but only for similar projects. Different projects continue to work differently. The Key Process Areas at this level include:

- Requirements Management
- Software Project Planning
- Software Project Tracking and Oversight
- Software Subcontract Management
- Software Quality Assurance
- Software Configuration Management

Level 3:

Level 3 is characterized by the presence of an organizational common process, but one that is tailored for individual projects in a controlled manner.

The Key Process Areas are:

- Organizational Process Focus
- Organizational Process Definition
- Training Programme

- Integrated Software Management
- Software Product Engineering
- Inter-group coordination
- Peer Reviews

Level 4:

This level called “Managed”, is characterized by measurements of the process and the products. Key Process Areas are:

- Quantitative Process Management
- Software Quality Management

Level 5:

The “optimizing” Level 5, indicates a culture of continuous process improvement. Key Process Areas include:

- Defect Prevention
- Technology Change Management
- Process Change Management

Challenges to be faced in CMM/KDM in medium scale organizations:

Challenges	CMM	KDM
Individual dependence	Need of xperts	Gain through

		knowledge itself
Overloaded persons	Allocation of multiple jobs	Need of statistical reports
Human factors	Low	Low
No of projects	Low	High
Customer communication	Low in medium	Easy and user friendly
Funding constraints	High	Low

Characteristics of a medium scale organization evaluating the performance evaluation:

Characteristics	KDM Model		CMM Model	
	HIGH	LOW	HIGH	LOW
Requirements	✓			✓
Process Support	✓			✓
Organization support		✓	✓	
Cost/schedule		✓	✓	
Testing/services	✓		✓	

Conclusion:

When compared to CMM and KDM in medium scale organization it is being effective while through the results when

using with KDM models, by all means of cost/budget,time management in scheduling the projects with its compatible resources, to avoid delay and overrun , improving the quality and performance through communication towards the customers in the process and organization to lead a good development process enhancements.

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