Application of People Capability Maturity Model in I.T Industry

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Abstract

The present study was conducted to examine the implementation of PCMM in the Indian IT Industry by analyzing the perceptions of managers regarding the reasons for PCMM implementation, people related issues and benefits of PCMM. The objectives of the study were to gain a conceptual understanding of PCMM, to examine the methods and application of PCMM in IT industry and to gain an overview of the dissemination of PCMM on organizational field by focusing on the implementation of PCMM in organizations, and its impact on the effectiveness of people management and the overall business. Based on the findings of literature review a questionnaire was developed using Google Docs. Subjects of this study were managers belonging to middle and higher managerial positions of various IT companies with PCMM certification ranging from Level 2 to Level 5. The data collected was then analyzed using statistical tools like SPSS and Microsoft Excel.

The survey brought out that the reasons for PCMM certification do not vary significantly across IT companies. The Level of PCMM to which an employee's organization belonged had a significant impact on his/her perception of factors leading to success of IT projects. Reducing turnover was rated as the most prevalent issue followed by overcoming low morale and burnout, and identifying competencies. Integrating workforce development with process improvement was ranked as the most important benefit of PCMM implementation.

Key Words: PCMM, Organizational Change, HR Practices, Development, Process Maturity

I. Introduction

The People Capability Maturity model (P-CMM), a process maturity framework developed by the Software Engineering Institute (SEI) at Carnegie Mellon University, measures the maturity of proven, effective workforce practices. The model was created with input from more than 30 different companies, including Boeing, Lockheed Martin, and IBM.

People CMM is a roadmap for implementing workforce practices that continuously improve the capability of an organization's workforce. In the late 1980s, the global upsurge in the information technology business saw the demand for software soar. This growth also saw an increase in software development, which led to organizations sharpening their focus on the processes used in software development. The need for improved processes required strict process analysis and assessment methods to be put in place. This resulted in development of the Capability Maturity Model (CMM) standards for software by the software Engineering Institute (SEI) at Carnegie Mellon University (CMU).

Maturity Levels in the PCMM

A capability maturity model (CMM) is constructed from the essential practices of one or more domains of organizational process. The People CMM concerns the domain of workforce management and development.

A maturity level is an evolutionary plateau at which one or more domains of the organization's processes have been transformed to achieve a new level of organizational capability.

The People CMM applies the principles of Humphrey's maturity framework to the domain of workforce practices. Each of the People CMM's five maturity levels represents a different level of organizational capability for managing and developing the workforce. Each maturity level provides a layer in the foundation for continuous improvement and equips the organization with increasingly powerful tools for developing the capability of its workforce.

The nature of the transformation imposed on the organization's workforce practices to achieve each level of maturity is depicted in figure below.

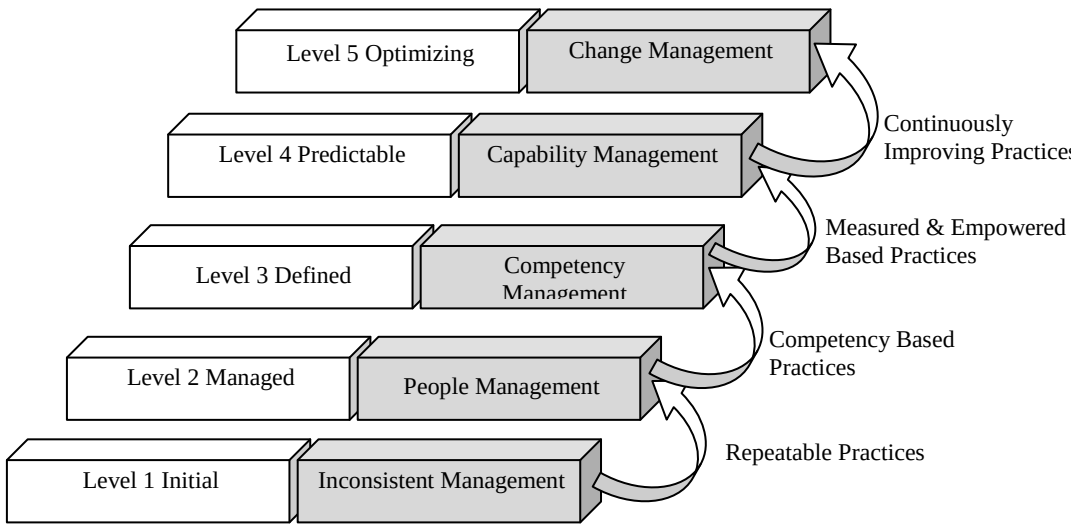


Fig: Five Maturity Levels of The People CMM

Source: Adapted from Humphrey [1989] and Carnegie Mellon University [1995]

Behavioral Characteristics of Maturity Levels

The People CMM stages the implementation of increasingly sophisticated workforce practices through these maturity levels. With the exception of the Initial Level, each maturity level is characterized by a set of interrelated practices in critical areas of

ISSN: 2249-1066, Vol. 4, No. 1, June, 2014

workforce management. When institutionalized and performed with appropriate regularity, these workforce practices create new capabilities within the organization for managing and developing its workforce.

Maturity Level 1 — The Initial Level

Organizations at the initial level typically exhibit four characteristics:

1. Inconsistency in performing practices,
2. Displacement of responsibility,
3. Ritualistic practices, and
4. An emotionally detached workforce.

Maturity Level 2 — The Managed Level

The workforce practices implemented at the Managed Level focus on activities at the unit level. The first step toward improving the capability of the workforce is to get managers to take workforce activities as high priority responsibilities of their job.

The practices implemented at Maturity Level 2 focus a manager's attention on unit-level issues such as staffing, coordinating commitments, providing resources, managing performance, developing skills, and making compensation decisions. Building a solid foundation of workforce practices within each unit provides the bedrock on which more sophisticated workforce practices can be implemented at higher levels of maturity.

Maturity Level 3 — The Defined Level

The primary objective of the Defined Level is to help an organization gain a competitive advantage from developing the various competencies that must be combined in its workforce to accomplish its business activities. These workforce competencies represent

critical pillars supporting the strategic business plan, since their absence poses a severe risk to strategic business objectives. In tying workforce competencies to current and future business objectives, the improved workforce practices implemented at Maturity Level 3 become critical enablers of business strategy.

Maturity Level 4 — The Predictable Level

An organization at the Defined Level has established an organizational framework for developing its workforce. At the Predictable Level, the organization manages and exploits the capability created by its framework of workforce competencies. The organization is now able to manage its capability and performance quantitatively. The organization is able to predict its capability for performing work because it can quantify the capability of its workforce and of the competency-based processes they use in performing their assignments.

Maturity Level 5 — The Optimizing Level

At the optimizing level, the entire organization is focused on continual improvement. These improvements are made to the capability of individuals and workgroups, to the performance of competency-based processes, and to workforce practices and activities. The organization uses the results of the quantitative management activities established at Maturity Level 4 to guide improvements at Maturity Level 5. Maturity Level 5 organizations treat change management as an ordinary business process to be performed in an orderly way on a regular basis.

II. Review of Literature

According to Bill Curtis et al. (2002), PCMM provides a description of the workforce practices that might be expected to be in place in an organization to achieve a set of

ISSN: 2249-1066, Vol. 4, No. 1, June, 2014

goals for organizational improvement. When implemented and institutionalized in an organization, these workforce practices and activities are not de-contextualized, theoretical practices, but become intertwined in the performance of the organization. The PCMM addresses more than just human resource management; it also addresses aspects of process management through its focus on competency-based processes, measurement and analysis of performance extending from the individual level to aligning performance across the organization, and aspects of strategic planning as it relates to workforce and competency planning. Benefits as outcomes or business results have been realised in three clear areas: reduced turnover, increased employee satisfaction, and reputation signals. Direct outcomes include reduction in voluntary turnover, or departure rates and increased employee satisfaction.

The book by Bill Curtis, William E. Hefley and Sally A. Miller, 'The People Capability Maturity Model: Guidelines for Improving the Workforce' provides a brief list of benefits of PCMM. These benefits include: developing a common language for addressing workforce issues, especially between human resource management and line management; providing a framework for process documentation; effective competency management implementations etc.

In the context of the dynamic change environment of IT industry, KPMG conducted a survey based study (2009) of senior executives in the IT and Services Sectors to analyze their perception of process excellence and established practices that help bring it to a state of higher process maturity alignment with business needs. This study intended to understand the perceptions of the practitioners and top executives on the business benefits accrued from the use of process models / standards and thereby look at key characteristics of sustained excellence.

Inclination to align and adopt to ISO 9001 and CMMI standards observed to be high while other models have been adopted moderately.

KPMG in India's Process Excellence Survey, August 2009

Major conclusions of the study were:

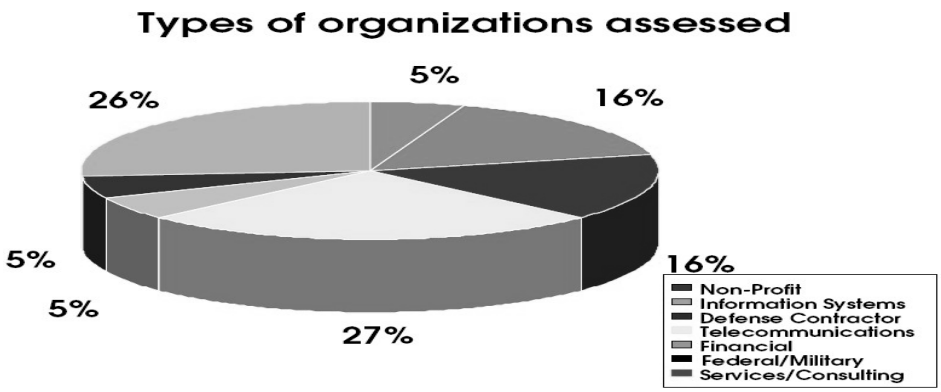
- Process models should be used more as enablers to reach the excellence and not as a destination.
- Accomplishments of process certifications should be viewed as the foundation for next level and as a journey instead of an end in itself.
- In order to sustain the path of excellence, operational and strategic directions are key ingredients. Many process models do provide operational directions while some provide strategic directions.
- One of the keys is to use frameworks to organizational advantage by harmoniously aligning the initiative to business needs and evaluating this alignment regularly with all key stakeholders, including customers.
- Prioritization of key initiatives is a critical step to achieving optimal and systematic institutionalization. Success of the initiatives largely depends on the way

ISSN: 2249-1066, Vol. 4, No. 1, June, 2014

they are internalized and ingrained as part of organizational culture and way of life.

- Excellence is a function of Quality People, Quality Process and Quality technology and above all Quality Leadership.

Software Engineering Institute (Carnegie Mellon University) conducted a survey in the year 2000 and came up with the following findings. People CMM Assessment Results as Reported to the SEI based on the Q-Labs 2000 documents.



Organizational trends since adopting People CMM

Data from organizations indicated:

1. Turnover
   - A decrease in turnover of 5 - 10 % below industry average
   - A decrease to 3-7% from an industry average of 18%

2. Employee satisfaction
   - An increase in employee satisfaction (on a scale from 1 - 10) of 2 points.
   - An increase of 3+ points on a ten point scale.

3. Organization Trends

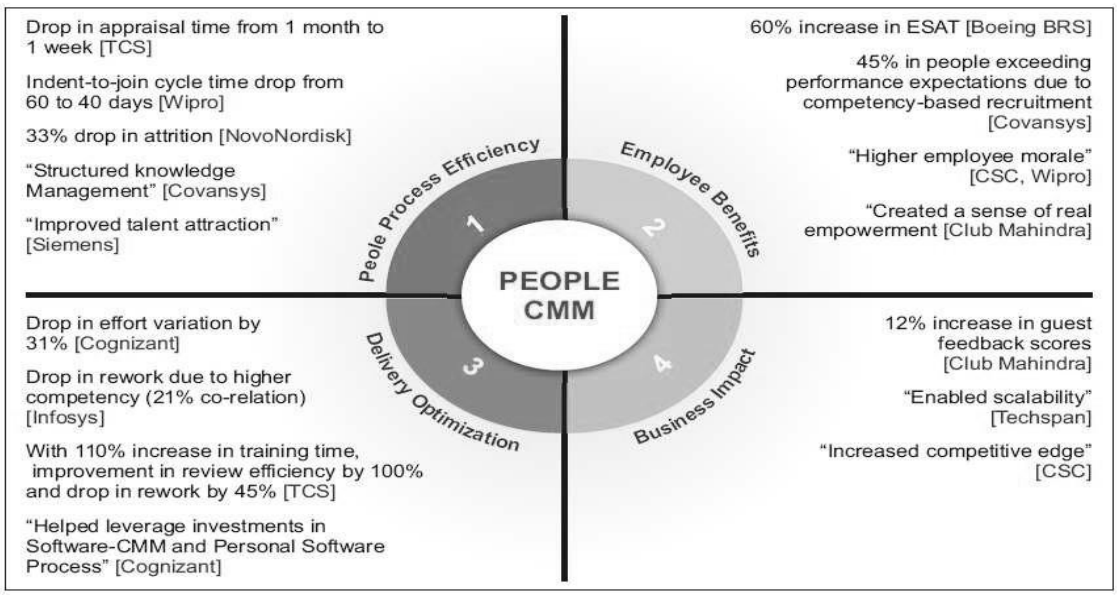
Most frequently identified People CMM improvement initiative by Level 1 organizations:

- Performance Management

4. Most frequently identified improvement initiative by Level 2 and 3 organizations:
   - Supervisor/Manager training, education or development.

According to a paper Organizational Excellence Using PCMM: **HCL Technologies Ltd.** BPO Services-A Case Study, 2007 by QAI Global Services, some of the documented benefits of PCMM application are:

Real Benefits Achieved from People CMM®:



According to a study 'Competency Assessment: Integrating COCOMO II and People-CMM for estimation improvement' conducted by Palacios et al. (2007), in current business environment, where information technologies control the management

ISSN: 2249-1066, Vol. 4, No. 1, June, 2014

of corporate resources, transversal leveraging of information is an opportunity that managers and IT workers should not waste if they are committed to the improvement of business performance and the development of human capital. The main objective of this paper was to identify a correspondence between the estimation and the evaluation of human resources from the point of view of competence management. This correspondence would allow the integration of both instruments into a unified framework, providing managers highly reliable estimation mechanisms.

III. Methodology and Project Objectives

This study was conducted to gauge the perceptions of managers towards the reasons for PCMM implementation and its benefits, and to assess how successful PCMM has been in achieving the desired results. Based on the findings of literature review a questionnaire was developed using Google Docs. The major factors assessed through the questionnaire were related to the reasons for PCMM implementation and the major benefits attained through this model. Subjects of this study were managers belonging to middle and higher managerial positions of various IT companies with PCMM certification ranging from Level 2 to Level 5.

Mode of questionnaire circulation was through e-mails as the respondents were located in various Indian states. Respondents belonged to companies like TCS, HCL, Wipro etc.

The **objectives** of the present study were:

1. To gain the conceptual understanding of PCMM.
2. To examine the methods and application of PCMM in IT industry.
3. To gain an overview of the dissemination of PCMM on organizational field by focusing on the implementation of PCMM in organizations, and its impact on the

effectiveness of people management and the overall business.

Sample Size: 24 subjects
Sample Design: Simple Random Sampling
Survey Method: Through Questionnaire

The questionnaire included a section on respondents' profile containing name, age, gender etc. There were questions on the critical factors for success of IT projects, reasons for PCMM implementation, people-related issues, and the benefits of PCMM implementation.

A five point Likert scale was used.

IV. Analysis and Interpretation

The data collected through the survey was analysed by using SPSS for calculating frequencies, means, and correlation analysis. Microsoft Excel was used for creating tables and graphs for presenting the data in a comprehensive manner.

To begin with, the demographics of the sample were analysed in terms of age group, gender and PCMM Level of organizations. Then responses to each question were analyzed by taking the mean values of each respondent's score for all the variables included in each question. On a scale of 1 to 5, mean value more than 3 indicated greater importance or a higher degree of agreement.

Correlation analysis was done to find out if any correlation existed between the various variables. For this purpose, the total means were first calculated for each question.

Descriptive Analysis

The questionnaire included a section on employee's profile. It included employee's gender, age, and level of PCMM in their organization.

Table 1

	Frequency	**Percentage**
Gender		
Male	18	75
Female	6	25
Age-Group		
20-30 Yr	19	79.2
30-40 Yr	2	8.3
> 40 Yr	3	12.5
PCMM Level		
Level 2	5	20.8
Level 3	4	16.7
Level 4	3	12.5
Level 5	12	50

Proper Planning was rated as the most important factor for success of IT projects by the respondents. It has the highest mean value equal to 4.04. The second most important

factors were Clear Statement of Requirements and Realistic Expectations, followed by Clear Vision and Objectives. The factor found to be least important was Smaller Project Milestones.

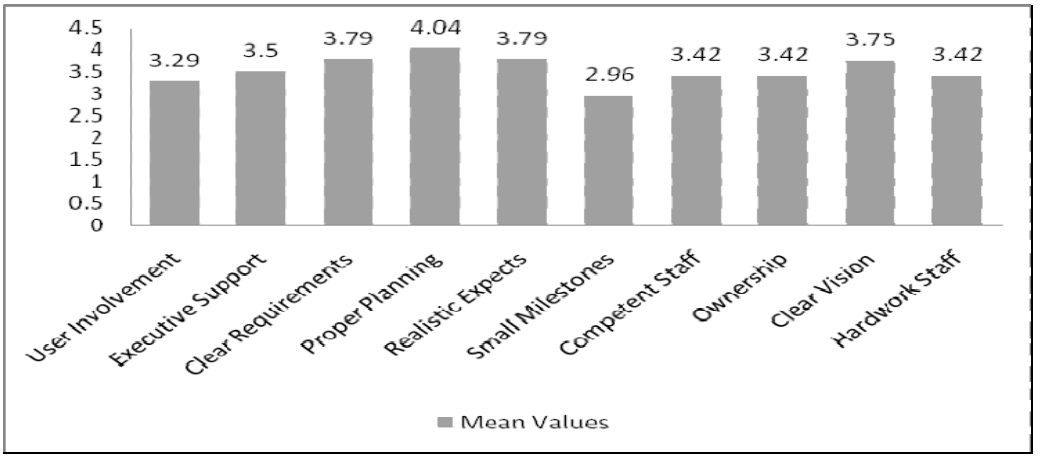


Fig: Important Factors In The Success Of I.T Projects

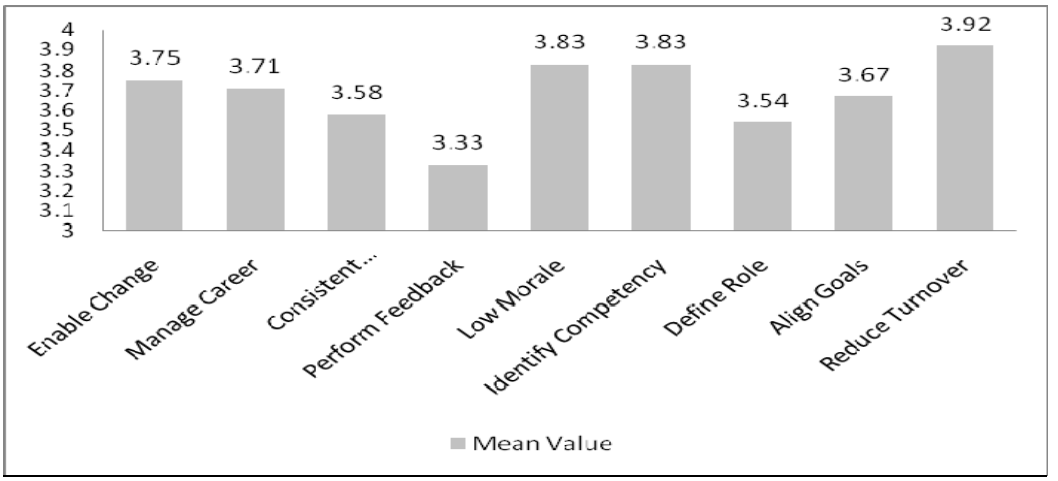


Fig: Prevalence of People Related Issues

Among the various people related challenges, Reducing Turnover was the most prevalent issue in the organizations, followed by Overcoming Low Morale and Burnout, and

Identifying Competencies. The least prevalent factor was Providing Clear Performance Feedback, i.e the organizations do not face much problem in this area.

Reasons for Conducting PCMM Assessment In The Industry

At the beginning of the twenty-first century, increasing numbers of organizations in India were adopting the People CMM. Though various practices like 360 degree performance reviews, team building, participatory decision making etc. were well known much before PCMM framework was designed, organizations failed to implement them due to a lack of management commitment and a piecemeal, un-integrated approach to adoption. This survey aimed at finding out the views of respondents regarding the reasons for PCMM implementation in the Industry.

According to the respondents gaining competitive advantage was the most important reason for conducting PCMM assessment. The second most important reason was to establish baseline workforce practices to enable appropriate improvement and hence to become an employer of choice, followed by organizational change and to sustain higher CMM levels via solid workforce practices.

Since most of the IT companies in India are competing on a global level to attract foreign clients, a higher PCMM certification acts as a competitive advantage.

Reasons for Adopting PCMM by Respondents' Organization

Respondents were asked to indicate the reasons of PCMM adoption by their respective organizations. A comparison between the major reasons cited for PCMM implementation in general, and the specific reasons for different Indian organizations shows that the most important reason for PCMM implementation in respondents'

organizations is to enhance business performance, this is similar to the earlier obtained reason 'gaining competitive advantage' which scored the highest importance considering the industry in general. Followed by this, three reasons, namely, Being Employer of Choice; Managing Intellectual assets, Knowledge Capital, Human Capital; and Measuring HR's Contribution to the Business were found to be of equal importance to the Organizations regarding PCMM assessment. This shows a change in perspective of organizations. PCMM implementation is not merely a certification to boast about, organizations have begun to realize its potential as a framework to manage their intellectual assets and to measure the effectiveness of various HR initiatives. Being an employer of choice alone is not sufficient to compete in the talent wars. Having attracted and recruited the best talent available is only the initial step. High turnover is the result of increasing demand of talented employees in the market, one way to tackle this issue is to be able to codify the knowledge base and store it for future use. The survey brought out that management of intellectual assets is being given importance at par with other popular reason like being employer of choice.

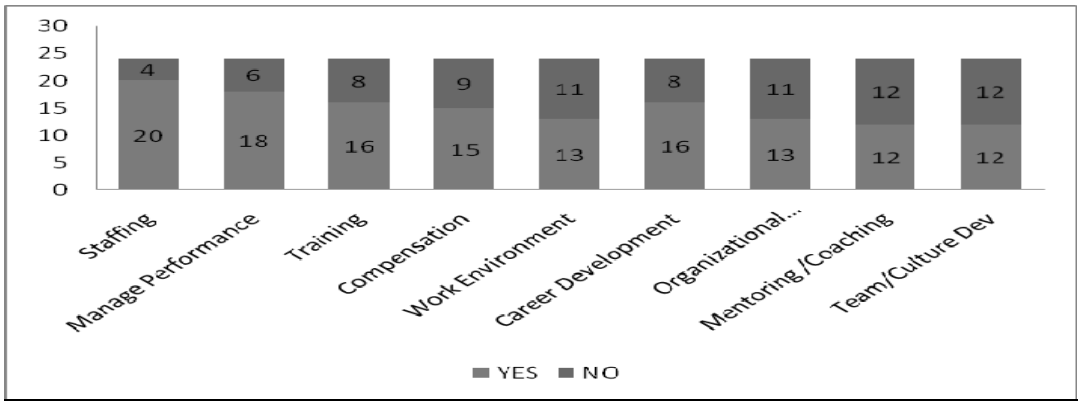
A noticeable finding was that though reducing turnover was cited as the most prevalent people-related issue, controlling attrition was not rated as the most important reason for PCMM implementation. The survey showed that organizations focus on other reasons more, instead of merely trying to control attrition. Moreover, benchmarking was rated the lowest in importance as compared to other reasons. Though, organizations strive hard to benchmark their practices, implementation of PCMM is not done primarily for this reason in most cases.

Areas of Practice

Respondents were asked to mention the areas where PCMM implementation has been

ISSN: 2249-1066, Vol. 4, No. 1, June, 2014

undertaken in their organizations. This was done to find out the most prevalent area of implementation.



It was found that 83.3% respondents stated 'staffing' as the area of practice of PCMM in their organization. Other common areas of practice were found to be Managing Performance, Training, and Career Development etc. Mentoring/ Coaching, and Team/ Culture Development are least prevalent. This may be due to the fact that only 50 percent or the respondents belonged to organizations with level-5 PCMM. This is the level where mentoring, coaching etc come into picture.

Reasons for the high prevalence of PCMM implementation in the area of staffing can be that it is a function that can be easily quantified, it is one of the most basic HR functions and all organizations, whether at level-1 or level-5, need to get their processes right in this area.

Enhancing business performance was earlier rated as the most important reason for PCMM implementation in respondents' organization, this finding corroborates the

second most prevalent area of PCMM implementation as managing performance. Though performance management is a complex area, its significance in overall business results makes it a popular area for PCMM implementation.

Correlation Analysis

In order to find out whether the various factors studied through the survey had any correlation among themselves, analysis of correlation was done.

Table 2

	Success Factors	**People Probs**	**PCMM Reasons**	**Import Reasons**	**PCMM AREAS**
Success_ Factors Pearson Correlation Sig. (2-talled)	1	-0.102 0.634	0.247 0.244	0.132 0.538	0.180 0.400
People_ Probs Pearson Correlation Sig. (2-talled)		1	0.182 0.394	-0.074 0.733	0.210 0.324
PCMM_ Reasons Pearson Correlation Sig. (2-talled)			1	0.504 0.012	-0.339 0.105
Import_ Reasons Pearson Correlation Sig. (2-talled)				1	-0.368 0.077 24
PCMM_ Areas Pearson Correlation Sig. (2-talled)					1

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Correlation analysis shows a positive correlation between Reasons for conducting PCMM assessment by Organizations in general, and the important reasons for PCMM assessment in respondents' organizations. The correlation was found to be significant at 0.05 level of significance.

Further, the correlation between Practice areas of PCMM and Important reasons for PCMM assessment in respondents' organizations is found to be significant at 90% confidence interval.

Ranking for Benefits of PCMM

Based on literature review certain benefits of PCMM implementation were identified. Those benefits were then framed as a question where respondents were instructed to rank those benefits.

Rank 1= Highest Rank and **Rank 5**= Lowest Rank

Based on the responses the following rankings were obtained:

Table 3

Rank Awarded	Variable
1	Integrate workforce development with process improvement
2	PCMM guides program of continuous development.
3	PCMM characterizes the maturity of workforce practices
4	Establish a culture of software engineering excellence
5	To set priorities for immediate actions

V. Findings and Conclusions

The survey brought out that there exists a positive correlation between the various reasons for conducting PCMM assessment in organizations and the actual reasons for adopting PCMM by the respondents' organizations. This shows that the reasons for PCMM certification do not vary significantly across IT companies.

Also, the study showed a high prevalence of people-related problems in IT organizations. Reducing turnover was the most prevalent issue followed by overcoming low morale and burnout, and identifying competencies.

Faced with the need to demonstrate quicker results, organizations do not always appear to adequately focus on the means to attain successful process certifications or appraisals. Failing to focus on means in the adoption of process models can lead to its unsustainable implementation. As a consequence the intended benefits of achieving excellence cannot be fully experienced. While adopting relevant models does help organizations get on to the path of excellence, restricting this pursuit to process certifications and awards can severely impact the value of the journey towards excellence.

The key message is that not just choice of models, but the right application of pertinent process models / standards, provides the key to sustained excellence. Process excellence can significantly help transform the business by aligning and creating harmony amongst all parts of the business process that serve to understand customer needs and deliver a solution exceeding customer expectations profitably. In fact excellence becomes a part of culture when harmonized in every single activity, with focus on internal or external customers.

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VI. Recommendations

1. Although process models help determine what needs to be done, it is the organizational execution strategy that determines how well it is done. Significant thought and home-work, if invested at the start of execution planning, on how to align process models to business need, helps get better results.
2. PCMM should be used as a guide/checklist for planning and implementing good practices.
3. PCMM should be used as a guide on a strategy for developing the organization overtime. It determines 'what to do', but not 'how to do' it.
4. Higher levels of PCMM should not be focused on without proper foundation in the lower levels.
5. PCMM assessment is not very useful if conducted without commitment to the next step. Organizations might start feeling complacent with their current PCMM Level, and sometimes they fail to gauge the benefits of higher levels.

VII. Limitations and Scope for Future Research

1. A bigger sample size can provide better representation of companies.
2. Across Industry study needs to be conducted to find out the scope and effectiveness of PCMM in various sectors.
3. Longitudinal research can be conducted to study the effectiveness of HR initiatives and their relevance overtime.
4. Detailed study of each level of PCMM can be done by studying organizations at same level and analyzing their process areas and benefits.

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