Chapter IV

REVIEW OF LITERATURE

A good research is one that has given adequate importance and time to dig into the earlier literatures available in that discipline. Thus researches are expected to provide ample information about the past studies and research that has been carried out by different experts and researchers, to bring out the need and importance of the present research. Research studies are said to be empty without proper literature search.

Literature includes all those information relating to the topic, that has been collected from various sources like past research studies, experts reviews, reference books, journal / newspaper articles, web-browser data, etc.

The literature for this research study has been collected extensively over an extended period and all the literature were reviewed and organized under different headings, for the convenience of the readers. The different headings under which the literature has been reviewed are as follows:

- People Capability Maturity Model
- Importance of people management
- Level 2 Key Process Areas
- Level 3 Key Process Areas
- Level 4 Key Process Areas
- Level 5 Key Process Areas
4.1 Review of Literature related to People Capability Maturity Model

PCMM has been little research on the people side of software engineering and how this human dimension impacts on the productivity of software developers and the quality of the software they produce. Contrast this with the effort being invested in producing software process methods [Mackie and Rigby, 1993].

The P-CMM describes abilities required to perform activities at different maturity levels. Activities associated with a specific maturity level can be performed on lower maturity levels as well, but will be hampered by lack of underlying skills. Processes from a higher maturity level cannot reach their full potential until the proper foundation is laid [Paulk, 1993].

P-CMM is intended to assist the change, by supplementing CMM in the area of HRM [Curtis, B., Hefley, W. E., Miller, S., & Konrad, M. D., 1994].

From the perspective of the People Capability Maturity Model (PCMM), it is a competency development activity. The reason for the PCMM is to attract, develop, motivate, organize, and retain the talent needed to steadily improve an organization’s software development capability. The PCMM has a set of capabilities that form the basis of development. A key component is to have an organizational wide process to continually develop the capabilities of all employees. Each employee has a self-development plan. Within the organization a documented process exits that defines the goals, capabilities, activities, and measures the organization will use to ensure that employees meet their self development goals [Curtis, Bill; Hefley, William E.; and Miller, Sally, 1995].

The application of the CMM to a micro team has shown that another critical factor must be taken into careful account besides the software process: the human
resources factor of the team and its management. This has shown to be particularly sensitive, because: a) the level of maturity of the software solution was initially very low; and b) the small dimension of the SS did not facilitate a global cultural change, unless it was attempted directly through each member. In summary, the application of the CMM to a micro team must be carried out judiciously by permanently adapting to the environment of the team, using just the KPs that are really important to the process, and keeping in mind that team management is just as important as process management. The relevance of the factors regarding human resources has been recognised by other authors [Bach, J, 1995] 5, and even by the SEI in its publication of CMM V.1.1: "The CMM may also become multi-dimensional to address technology and human resource issues". This resulted, in 1995, in the publication of the P-CMM - People Capability Maturity Model [Curtis, B., Hefley, W., and Miller1995] 6. Also in 1995, the technological dimension has been addressed in the SE-CMM - Systems Engineering Capability Maturity Model [Bate, R.et.al, 1995] 7.

The research which combines the traditional human resource management and the procedure of P-CMM uses the theoretical model of P-CMM to illustrate different ways of improving human resource management by Studying the organization of a public hospital, This research seeks to establish the ways in which the second-level of maturity of a P-CMM model can be achieved [Hsin-Yu Tsai 1996] 8.

The basic processes of Level One as defined by the People Capability Maturity Model need to be in place before such dialogue can begin [Park, Robert E.; Goethert, Wolfhart B.; and Florac, William A, 1996] 9.

Failure to specify the people factor in the process represents the risk of developers performing activities that are beyond their capabilities. Existing process models do not formalize the skills and capabilities of each member (managers,
developers, support personnel, practitioners, expert’s customers and users) to assure that the project team is effective and efficient [Humphrey WS, 1998] 10.

The 1999 Survey of High Maturity (Software CMM) Organizations found that 10 of the 37 Level 4 and 5 responding organizations reported the People Capability Maturity Model as an ongoing additional quality/process initiative [Mark C. Paulk, Dennis Goldenson, and David M. White, 1999]11.

Because of PCMM implementation, the following benefits were attained in Q-labs: A decrease in turnover of 5 - 10 % below industry Average and An increase in employee satisfaction (on a scale from 1 - 10) of 2 points [Dr. Bill Hefley, Dublin, Ireland, 2000]12.

Enhancing the capacity of software development and software quality of the work of the three major dimensions are "technical", "process" and "officer". There, SDCMM only focus on the assessment. Emphasis on "technical" and "process" and the "officer" in this regard to consider the assessment of the project is only focused on personnel training programs, systems and training performance Assessment, and lack of consideration of other software on the impact of human capacity factors, such as working conditions, salaries, team culture, career planning staff, etc. Therefore, it is relatively insufficient. The SEI developed the P-CMM model, in considering the impact assessment of staff capacity on a more comprehensive dimension [Dr. Huang Shizhen Graduate Zheng Bin Chang, 2001]13.

In PCMM, by focusing on each process area thread and the processes and practices embodied at each level, an organization begins disciplined development of its human capital, moving from an organization that haphazardly treats human capital issues to a mature organization that strategically manages its human capital to gain competitive efficiency and advantage [Hal M. Todd, Douglas S. Parten, 2003]14.
Incorporating PCMM in to our environment helps us plan, develop a strategic implementation roadmap, and implement staged improvements [Intel, 2003].

The virtual teams with comparable start-up conditions evolve in different ways [Andriessen, Hettinga and Wulf, 2003]. The evolvement of a virtual team can be evaluated by People Capability Maturity model (P-CMM) developed by the Software Engineering Institute (SEI) [Carmel, 1999]. The model helps software organizations to integrate team development with software process improvement.

The assigning people to roles according to their capabilities and the capabilities demanded by the role improves software development [Silvia T. Acuna, and Natalia Juristo, March 2004].

The software process models considered focus on examining the process agents, attaching less importance to other process elements like roles, for example, which are not formally defined, and human and role capabilities, which are not explicitly modelled. The main drawback of all these models is that they do not consider the cultural environment of the software process and its integration with the organizational and technological environments. The People-CMM is the only one that models the capabilities of the human resources belonging to the organization and their associated roles in the software process, but the capabilities of the agents are represented informally and no modelling procedure has been developed for their inclusion in the software process. The strength of the model proposed in this paper lies, as mentioned earlier, in its use of intrinsically subjective methods (Assessment Center Method) to deal with people, the most subjective part of the software process. The People-CMM, by contrast, tried to come up with simplistic, objective techniques that are not best suited to this problem [Silvia T. Acuna, and Natalia Juristo, March 2004].
P-CMM levels are like a house of playing cards. You pull one out and the whole house topples down. Hence, it is not possible to scale Level 5 without having every card at the lower levels in place. For instance, if workforce practices at lower levels are not in place, an organisation cannot move up to higher levels [Ajitabh, 2006]²⁰.

P-CMM is not just a tool or model for implementing people processes for enhancing competitiveness. It is rather a bible for streamlining and aligning HR processes with the group’s business strategy. It gives confidence to an organisation to compete in the global arena [Ajitabh, 2006]²¹.

PCMM aims at improving people’s capability by integrating improvements in processes and the workforce. In short, the PCMM aims at creating world-class people and process quality, in turn developing individual and organisational competencies [Dilip Dutta & Anna Sekhar, 2006]²².

Because of PCMM implementation, the following benefits were attained in HCL: Drop in attrition from 17% to 11% per Quarter, Availability of formal career development program and Competency Development opportunities, Training throughput increased from 68% to 84%, Revenue increased from 15.2 million to 21.1 million with an headcount increase from 1354 to 1442 [HCL, 2006]²³.

4.2 Review literature related to Importance of people management

“Until convincing evidence to the contrary is available, this suggests that human resource management can most sensibly be viewed as one approach to managing work force. Other approaches are equally legitimate and likely in certain contexts to be more successful” [Guest, 1987]²⁴.

The policies in an ideal adhocratic HRMS [HRM system] are rationally designed and integrated to create organizational flexibility, to provide an integrated
organization with minimal conflict, and to provide highly competent, committed workers [Begin, 1993] 25.

The main factor separating successful firms / organizations from their competitors is the organization itself and how it manages its employees [Pfeffer, 1994] 26.

An approach to HRM is that there is a number of “best practices” or best solutions regarding people management that generally lead to increased success regardless of the organisation’s strategy or structure [Pfeffer, 1995] 27.


HR managers become able to reengineer the way HR department executes its job, accomplishes those transactional HR job’s cost-competitively, and increasingly turn its attention to truly being a strategic partner with the firm’s top executives [Sherif and Mazen 1998] 30.

The line managers have a limited strategic focus and argue that “The absence of a designated human resource specialist role may therefore be argued to have had a significant negative effect on the organization’s ability to achieve strategic integration in relation to the management of its human resources, with further negative consequences for commitment to the organization, flexibility and quality” [Thornhill & Saunders, 1998] 31.

The devolution of HR responsibilities to the line makes HR departments vulnerable, but that “the acknowledged shortcomings of line management, particularly with regard to the management of subordinates, may help to confirm a continued
presence for personnel as a discrete, if less than strategic function” [Cunningham & Hyman, 1999] 32.

In the case study it is suggested that line managers feel frustration at not having sufficient time to deal with HR issues because of the dominance of ‘hard’ objectives, such as output and reducing costs [Cunningham & Hyman, 1999] 33.

The Quality Management Metrics covers management of requirements, estimation / planning, risk, and people. Of these, people management is seen as its most important component with the highest impact on success probability [Machniak, 1999] 34.


The argument for using the term ‘people’ instead of ‘HR’ in order to “expand the relevant practices to those beyond the control of the HR function (i.e. the HR department)” [Wright et al., 2001] 38.

The Danish hearing-aid company Oticon had no HR department at all when the new purely project-based structures were first implemented. Instead, project team leaders, coaches, and the employees themselves were the central players in performing HRM. This implies that an efficient and well functioning people management system is not only dependent of an effective HR department, but of an effective HR organisation [Larsen, 2002] 39.

The question rose whether line managers have the time, the ability, or even the wish to take on this responsibility [Larsen & Brewster, 2003] 40.
4.3 Review literature related to Level 2 Key Process Areas

Human resources are the critical variable in software development, largely due to the increasing relative cost of staffing [Bartol, 1982] 41.

The report says that large differences in productivity between organisations. They claim that, the best organisations worked 11.1 times faster than the worst, and produced better code. According to DeMarco and Lister, the poor performers have “something about their environment and corporate culture [which] is failing to attract and keep good people or is making it impossible for even good people to work effectively’ DeMarco and Lister also say that “people who perform better tend to gravitate toward organizations that provide a better workplace” [DeMarco and Lister, 1987] 42.

Human resource specialists, academics, and consultants proclaim that performance management is a critically needed tool for effective human resource management [Bernardin and Beatty, 1984] 43. This, in turn, is based on the belief that an effectively designed, implemented, and administered performance management system can provide the organization, the manager, and the employee a myriad of benefits [Cascio, 1987] 44.

It is found that information systems personnel ranked the work itself higher than any other factor in the work environment [Couger, 1988] 45.

Too often technical training is given priority over personal effectiveness. This can result in people having technical expertise but no real ability to deal with people in a clear and fair way. By balancing technical training with assertiveness training it is possible to develop people who not only know what to do but also how to do it by working with people [Fritchie, 1988] 46.
In the ideal situation, employees in an organization are eager to help meet its mission. They have good intentions, and they work hard. But by any measure, organizations must develop formal systems to encourage, track and reward employee involvement. Otherwise, the extent and quality of participation might very well decline, and this would result in a very dissatisfied work force [Chevalier, 1991]^{47}; [Griffin, 1988]^{48}.

Personal mastery efforts depend on setting aside the assumptions that people are primarily motivated by money, recognition, and fear. Instead, you must assume that in the right atmosphere people will contribute and make commitments because they want to learn, to do good work for its own sake, and to be recognized as people [Senge’s 1994]^{49}.

Lack of training and development opportunities and promotion may have prompted employees to think that they are not valuable assets in their current organisation [Lee & Mitchell, 1994]^{50}.

Performance management revolves around the concept of teamwork, communication, style of management, behaviour and attitudes, shared vision, involvement of the employees, development of competencies of the employees, and giving of rewards and incentives. It is also built on the measurement of the performance and is more concerned with the total effectiveness of the organisation as a group [Lebas 1995]^{51}.

Although no performance appraisal process is perfect (1 out of 3 employees will usually be dissatisfied with the process), a collaborative performance appraisal seems to provide for the best improvement in performance and positive attitude about performance appraisal [Zawacki and Couger, 1998]^{52}. 
The performance management system includes giving of information which has relevance to the organisation (i.e. communication within the organisation), promotion of adequate behaviour (i.e. motivation), providing a system for ensuring control and accountability (i.e. control) and creation of system for learning (i.e. development and improvement) [Neely, 1998] 53.

HR development practices include those that focus on training (i.e. immediate concerns) and development (longer term). Recent studies into HRM practices have demonstrated that HR development practices can be used to achieve organisational objectives and can be a means to minimise staff turnover [Cheng & Brown, 1998] 54.

Financial incentives cannot be underestimated or explained away. Recruiting and retaining is a matter of providing interesting and diverse projects and fair pay [Palmer et al., 1998] 55.

The myths and empirical realities of financial incentives and financial incentives work in concert with intrinsic rewards. Money does matter. They summarize “Pay people well, pay people fairly, then do everything possible to take money off people’s minds. Money is a necessary (although not sufficient) condition for effective motivational systems” [Nina Gupta and Atul Mitra, 1998] 56.

The training is an essential component of high performance work systems because these systems rely on frontline employee skill and initiative to identify and resolve problems, to initiate changes in work methods, and to take responsibility for quality [Pfeffer and Veiga, 1999] 57.

The lack of structures for cross-project coordination, argues, constitutes a problem for the long-term effectiveness and learning of project-based organisations due to a “lack of incentives for human resource development” This, he says, can also breed insecurity over career development and professional progress [Hobday, 2000] 58.
Lower level employees’ not receiving adequate help with heavy workloads has the greatest effect on the length of the delays [Hersleb et al., 2001] 59.

Research also indicates that without the rich source of information cues, team members are vulnerable to cascading misunderstandings and miscommunications that can derail project efforts [Dodson, 2001] 60.

All in all, team members must communicate whenever necessary in order to make the team work efficient [Ebert and De Neve, 2001] 61.

The importance of informal communication cannot be too stressed. The lack of informal communication and knowledge about the local working context is the one distinguishing factor of distributed groups [Pauleen and Yoong, 2001] 62.

Attracting, motivating and retaining software development employees have become more critical under today’s global competition and fast pace of technological revolution [Horwitz, et al., 2003] 63. This is because the success of IT companies relies heavily on the human capital of software development employees, who can match the use of advanced technologies to the companies’ needs [Mata, Fuerst, & Barney, 1995] 64. Therefore, although a training approach is important to close the skills gap, retention of existing software development employees is also important.

The competitive aspects of selection decisions become especially critical when organizations are confronted with tight labor markets or when competitors tap the same labor market. If one company systematically skims off the best applicants, the remaining companies must make do with what is left [Noe. et al., 2003] 65.

People also need unplanned communication and informal contact with other workers [Damian, Lanubile and Oppenheimer 2003] 66.

Careers in project-based firms and argue that “there is a shift from viewing careers in terms of promotion and subordinates to viewing careers as continuous

The individualisation places higher requirements on organisations to create attractive and developing working environments in order to attract and keep valuable employees [Horwitz, et al., 2003] 68.

On improving performance, the research conducted by suggest that the introduction of the performance management system in the bank did have a positive impact on performance [de Waal, 2004] 69.

Quality professionals must be in the vanguard of helping organizations increase competitiveness, but they will be listened to only if they communicate what they offer in clear terms that managers and employees can identify with. Improving performance through good planning, better processes and full involvement of the people should be the focus for quality professionals in the 21st Century [Oakland, 2005] 70.

Other researchers identify problematic issues concerning staffing and resource allocation [Clark & Wheelwright, 1992] 71 and, as mentioned previously, recent studies have also paid attention to the question of work situation and stress for individuals that work in project-based organisations. These studies argue that such organisations often imply high work intensity and an increased individual responsibility, combined with many parallel activities, which can lead to health problems and feelings of ‘project-overload’ among project workers [Zika-Viktorsson, et al., 2006] 72.

Staffing as HRM activities associated with hiring employees and filling positions [Ployhart, 2006] 73. Organizational effectiveness depends on finding the right people in the right job at the right time [Bechet and Walker, 1993] 74.
Work content which involves long working hours and an inflexible working life, results in job-hopping proclivities in the IT industry and thus a high level of voluntary turnover [Khatri, Chong, & Budhwar, 2001] 75. This is regarded as an unfriendly workplace in the IT industry, one which could influence software development employees to leave an organization despite an attractive salary and stock bonus [Chen & Huang, 2006] 76.

4.4 Review literature related to Level 3 Key Process Areas

Final outcome of any (software development) effort is more a function of who does the work than of how the work is done [DeMarco and Lister, 1987] 77.

Weisert lays out a method to develop staff resulting in more professional, competent people. He cites the need for the staff to view themselves as professionals. He goes on to outline characteristics of a professional in a software development organization [Weisert, 1988] 78.

IS Managers tends to perceive their subordinates in subgroups. The manager’s perceptions may differ radically from the members’ actual behaviour [Ho Ahn and Lee, 1988] 79.

Benefits of career development are equally important for the employee himself/herself and for the employer [Margerison, 1993] 80. If the purpose of an organisation is to make profit, than the best developed employees will produce the greatest profit.

Organisations must assume full responsibility for anything they “touch”, including their employees. Organisations often superficially agree with this sentiment of responsibility to employees, however, few actively follow through [Drucker, 1993] 81.
Identifying and developing core competencies are a viable approach to build competitive resources. Organizational competencies as firm-specific resources and capabilities that enable the organization to develop, choose, and implement value-enhancing strategies [Lado and Wilson, 1994] 

The parties of globally distributed software product development need to deal with the issues that affect the teamwork. It is important to ensure close relationship and two way communication and collaboration that are essential for successful relationships [Barbosa and Vaidya, 1995] 

Through an analysis of rating categories for job performance among supervisors and programmer/analysts, where supervisors and employees agree in four factors: communication skill, job attitude, business knowledge, and technical skill [Farson, 1996] 

Increasing diversity within business organizations and the growing interdependence of various stakeholders within a business ecosystem demands for a more inclusive and collaborative leadership style. In today’s business environment a team approach to problem-solving is required. This requires a leader who is comfortable sharing power and generous in doing so, is able to see extraordinary potential in ordinary people [Fitz-enz, J., 1997] 

It is obvious today that a person must constantly develop new and better personal skills. New jobs and new tasks are more demanding and more challenging, so individuals need to be available, ready and prepared enough to accomplish new and technologically more sophisticated tasks and duties [Ivancevich, 1994] 

A critical psychological component of meaningful work to be a job’s core dimension of skill variety, task identity and task significance; experiencing
responsibility for outcomes of the work as defined by the level of a worker’s autonomy; and knowledge of the actual results of the work activities as defined through feedback [Kahli, 1997] 87.

Teamwork has also been emphasised as a key feature of the flexible organization of the 1990s [Scully, Kirkpatrick & Locke, 1995] 88. According to One of the greatest payoffs from team-based organizations is that teams substitute peer-based control for hierarchical control of work [Pfeffer and Veiga, 1999] 89.

Learning cultures represent an intentional effort to decrease dysfunctional learning behaviour and increase the safety and trust necessary for sustained learning [Johanna Rothman, 1990] 90.

Global software product development involves constant teamwork among people from different cultures and places, and the meaning of effective communication and collaboration becomes truly important [Carmel, 1999] 91.

Career development has an individual and organisational aspect. It is the process of many correlated and harmonised individual's and organisation's activities, where individual and organisation are perceived as partners in promoting and developing the individual career [Bahtijarevi, 1999] 92.

Decentralised and more intensely interacting organizations need new kinds of human resource practices. Thus, there seemed to be considerable increases in the emphasis put on human resource management to provide the skills and the glue to make the flatter and more horizontal structures work [Whittington et al., 1999] 93.

The contemporary working life promotes loyalty to the own competence area, rather than to an organisation, which leads to a breakup of the traditional concept of employment. According to the authors, this might imply that organisations no longer have to take on the responsibility for competence development, and that it is instead
each individual’s own responsibility to develop his or her competencies in order to be attractive for future assignments [Damm & Tengblad, 2000] 94. Although fair remuneration is a popular tool to attract software development employees, other retention factors, such as career appreciation and development, are strong determinants in their decisions to stay or leave [Agarwal & Ferratt, 2001] 95. The work and career have become a ‘life project’ with the purpose of self-realisation and that loyalty therefore is closer attached to the own person than to any collective forms of loyalty bases [Lindgren, et al., 2001] 96. Delays in resolving work issues can slow the development process considerably [Hersleb and Mockus, 2001] 97. For knowledge-intensive organisations and their survival in highly competitive markets, the skills and competencies of individual employees are then crucial [Garrick & Clegg, 2001] 98. Software development employees seek work systems that are free from organisational constraints and enable them to achieve their goals [Ramakrishna & Potosky, 2001/2002] 99. In Maslow’s theory, the concept of career development (training and development and promotion) can be a motivator to satisfy software development employees’ higher-order needs of self-esteem. Employees with opportunities for training and development may decide to stay longer in the organisation [Smith & Rupp, 2002] 100. Here, knowledge, initiative, and the capability to employ oneself is what constitutes one’s position and “career success is exclusively a matter of one’s ability to create one’s own career path, not just follow a path that has been established by the organization” [Larsen, 2002] 101.
Autonomy is believed to be the most important structural factor in motivating behaviour of software development employees because it provides authority for decision-making [Davenport, 2005] 102.

Software development employees want to be valued for their contributions with increased autonomy of operating style, more trust, and they want to be included in the decision making process [Feyerherm and Vick, 2005] 103.

Software development employees are naturally attributed to challenging work, as it allows them to re-skill, adapt and upgrade their skill sets Identity is also significant, as software development employees are significantly motivated by the recognition of their status and prestige in their career development, which may include a set of critical skills that enhances their market value [Sumner, et al., 2005] 104.

In addition, as the values of each generation are different, their needs should be tailored to the diversities of their career stage [Craig & Hall, 2005] 105. It is suggested that employees whose career anchors are compatible with their jobs have higher career satisfaction levels and lower intentions to leave an organization than those who have incompatible career anchors with their jobs [Quesenberry, 2006] 106.

Firms invest more than ever in competence development of their employees [Lindeberg & Måanson, 2006] 107.

Software development employees are highly motivated when they are given meaningful assignments that allow them to be involved in the decision-making for their areas of expertise [Hytter, 2007] 108.

Retention of existing software development employees is the most cost-effective approach to offset the loss of knowledge, skills and competencies of IT companies [Somaya & Williamson, 2008] 109.
4.5 Review literature related to Level 4 Key Process Areas

Kanter then uses the logic that, "The productive capacity of nations, like organizations, grows if the skill base is upgraded. People with the tools, information and support to make more informed decisions and act more quickly can often accomplish more" [Kanter, 1979] 110.

For employees, successful outcomes of work life, hence of quality systems, are motivation, quality performance, satisfaction, low absenteeism and turn over [Couger and Zawacki, 1980] 111.

"To feel empowered means several things. We feel our survival is in our own hands. We have an underlying purpose. We commit ourselves to achieving that purpose, now " [Block, 1987] 112.

Organisational capabilities emphasises the experience, practiced routines and skills built into an organisation that differentiate it from other firms, and that enable it to carry out its core activities [Nelson, 1991] 113.

Without employee involvement, improvement cannot be ascertained [Flynn et al., 1995] 114.

“The mature, self-directed work teams should assume responsibility for appraising both team and individual performance.” The leader’s role is to coordinate information [Guinn, 1995] 115.

Empowerment as, "when employees 'own' their jobs; when they are able to measure and influence their individual success as well as the success of their departments and their companies" [Caudron, 1995] 116.

If employees are not involved in the development of the system, there is no question: they will not comply with the procedures and goals defined in the system [Vloeberghs and Bellens, 1996] 117.
Empowerment as, "employees having autonomous decision-making capabilities and acting as partners in the business, all with an eye to the bottom-line" [Ettorre's, 1997] 118.

Imagine that your job is to create an environment where your people take on the responsibility to work productively in self-managed, self-starting teams that identify and solve complex problems on their own [Honold, 1997] 119.

Developing individual competencies over time is one of seven elements essential to master for a company’s future competitive success [Liedtka, et al., 1997]120.

The notion of ‘permanency’ is only partly true, since even the capabilities need to be dynamic in a sense that they are developed and renewed over time [Teece, et al., 1997] 121.

“Commitment is about generating human energy and activating the human mind. Without it, the implementation of any new initiative or idea would be seriously compromised [Argyris, 1998] 122.

Broad banding allows lateral movement in the compensation framework for employees. In broad banding, technically competent and productive workers do not have to move out of their area of expertise into another area in order to be rewarded [Nicolai, 1999] 123.

Empirical results also support the assertion that employee involvement is directly related to continuous improvement [Ho et. al., 1999] 124.

The first habit is to seek first to understand, and then be understood. Competent software engineers seem to do this intuitively or empirically. The personal process pulse questionnaire that Weigers proposes can serve as a template for reviewing data collected via the project-tracking program [Wiegers, 2000] 125.
The capabilities perspective used in this thesis draws heavily on recent research into project-based organising that have argued for the usefulness of frameworks of organisational capabilities in order to explain how project based organisations build the capabilities required to generate and execute successful projects over time [Brady & Davies, 2004].

A prime enabler for the development of an organization’s human capital are the competencies of its people, which can be defined as the “set of behaviours that encompass knowledge, skills, abilities, and personal attributes that are critical to successful work accomplishment. They describe what the employees know, what they do, how they do it and translate into effective on-the-job performance” Thus, competencies are the factors that contribute to people’s worth as capital [GAO, 2004].

Software development employees have a high degree of expertise, education, or experience, and the primary purpose of their jobs involves the creation, distribution, application and reuse of knowledge [Davenport, 2005].

It is prophesised that employee engagement builds passion, commitment and alignment with an organization strategies and goals, attracts more people, increase employee’s trust, creates a sense of loyalty in a competitive environment, lowers attrition rate, increases productivity, improves moral, provides high – energy working environment and improves overall organizational effectiveness [Chitra mukunnan, 2006].

Mature workers can be effectively managed by increasing their autonomy and involvement under a flexible retirement work policy and a mature worker-friendly organisation [Dychtwald, et al., 2006].
From the point of view of workforce availability, it is a crisis that there is an insufficient number of skilled workers on a variety of employment levels and more importantly, companies’ tacit knowledge gained from experience could be lost [Garmise, 2006] 131. For example, retired people are unable to successfully pass on their knowledge and skills to the next generation of employees who replace them [McQuade, et al., 2007] 132.

Global demand for software development employees is believed to result in a severe war for talent, as the future success of a business is dependent on the battle for talent [Gopinath , 2007] 133.

Mentoring is another strategy that can be applied in WIHG for retaining and developing the talent. The young professionals look for the mentors who can give them advice, encouragement and space to grow. However, mentoring cannot have a standardized approach, as young officers want personal treatment. Based on the research, DeLong has described the qualities of good mentor. He is one who is someone absolutely credible; tells the things one may not want to hear but conveys a feeling that one has been heard; interacts with in a way that makes one to aim high; makes one feel secure enough to take risks; gives confidence to rise above inner doubts and fears; supports attempts to set stretch goals; presents opportunities and highlights challenges one might not have seen on his own [DeLong et al. (2008] 134.

4.6 Review literature related to Level 5 Key Process Areas

Culture is regarded as a crucial factor in innovation performance. Numerous anecdotal and empirical studies demonstrated that culture plays a major role in organizational innovation. This study thus, expects that the association between organizational process alignment and organizational culture would subtly affect organizational innovation [Feldman, 1988] 135.
The key task in change management is to mobilize employees towards the organizational goals. Equally, corporate managers must be sensitive to the powerful inertial forces inherent in organizational cultures. They must give as much importance to inculcating a culture of change throughout the organization as to their marketing or investment strategies. In market situations where the flexibility and responsiveness of work organization is crucial to competitive advantage, change management strategies are to be innovative and specific to company needs [McKinlay & Starkey, 1992]136.

Software is a very people dependent and creative activity. Metrics represents an opportunity for an organization to understand itself and improve. Build an atmosphere of mutual trust and respect for people’s ability to measure and understand the change necessary to remain competitive [Grady, 1992]137.

Integration of human capital elements within the organization’s strategic plan can result in better stock performance, higher profits, improved quality, and an enhancement of the organization’s position—in other words, a means to add value to the organization. This requires the organization to evaluate human resources/human capital practices as an element of a system with particular focus on how the human elements align with the strategic objectives of the organization [Becker & Gerhart, 1996]138.

Five kinds of firms according to the extent of innovation adopted: innovator, early adopters, early majority, late adopters and laggards. Firms profiting from innovation activities will be different according to the timing and extent of firm adoption of innovation. Generally, early adopters have more significant benefits from innovation than laggards [Subramanian, 1996]139.
There is an empirical link between HRM practices and innovation performance [Michie and Sheehan, 1999] 140.

The top management support is critical to continuous improvement [Hua et. al., 2000] 141.

Organizational process alignment refers to arranging the various parts of a company so that they can work together harmoniously and head in the same direction; therefore, they can seek common organizational goals, improve performance and sustain competitive advantage [Weiser, 2000] 142.

In two kinds of business alignment, the internal performance alignment is the more difficult, for two reasons: (1) the lack of methods for aligning all the work that goes on in the typical business, and (2) every person associated with the business is involved in one way or another. External alignment is the work of a few select executives, whereas internal alignment involves everyone in the organization [Danny G. Langdon, 2002] 143.

The pragmatic companies have more flexible ways of dealing with the environment while normative ones do not [Bartlett and Davidsson, 2003] 144.

Another study was conducted based on data from a Danish survey of 1900 business firms. They used principal component analysis, and identify two HRM systems which are conductive to innovation. The first factor included seven out nine HRM practices that matter equally for the ability to innovate. The second factor consists of firm internal and external training, which was found to be conductive to innovation. The study also indicated that while the adoption of individual HRM practices may be expected to influence innovation performance positively, the adoption of bundles of complementary HRM practices could be expected to affect innovation much more strongly [Laursen and Foss, 2003] 145.
Viewed as a valuable, unique and inimitable resource based on the resource-based view, organizational culture is a typical sustained competitive advantage of a firm that positively impact performance [Chan, Shaffer and Snape, 2004].

Employees skills and knowledge are important factors to firms successful innovation, since the human element is involved in the whole innovation process [Jimenez-Jimenez and Sanz-Valle, 2005].

Innovative organisations support creative activities through offering employees the freedom to work independently in pursuit of new ideas [Scott and Bruce, 1994] [Dobni, 2006].

Innovative HRM practices leads to organizational commitment. In systems of high commitment, HR processes increase organizational effectiveness by creating conditions where employees become highly involved in the organization & work hard to accomplish organizational goals [Bhatnagar, 2007].

Organizational culture can positively influence organizational performance by guiding staff, motivating employees and shaping employees’ behaviours toward specified goals [Daft, 2007].

Continuous process of systematic innovation and improvement can protect companies from the pressures of global competition [Drucker, 2007].

The only secure form of competitive advantage for companies is to actively embody tacit knowledge into the process of continuous incremental innovation consequently, the innovative use of tacit knowledge results in profit [Jones & Miller, 2007].

In a survey conducted by McKinsey consultancy the top three obstacles for talent management were: senior managers do not spend enough high quality time on talent management; organization does not encourage constructive collaboration.
and sharing of resources; and line managers are not sufficiently committed to development of people's capabilities and careers. Thus, it is not only important to attract talent but also fostering an environment in which the talented people are inspired to achieve their fullest potential [Guthridge, et al., 2008] 154.


High technology industry brought with it an additional important change — an emphasis on innovation. Creating an environment of innovation required a new managerial approach and new HRM emphasis. Empowerment, flexibility, collaboration, better use of employees’ collective wisdom and less formal structures is just a few of the basics in developing and encouraging innovation. In addition, tying compensation to performance, encouragement and recognition were used for creating a new organizational innovative culture [Lawler, 2008] 156.

Employee with higher level of commitment tend to take greater efforts to perform and invest their resources in the organization [Shrruti sahrawat, 2008] 157.
References:


13. Dr. Huang Shizhen Graduate Zheng Bin Chang (2001), “software organizations to enhance staff capacity to assess the maturity model” thesis published by National Taiwan University of Science and Technology Department of Information Management Software Engineering Measurement Laboratory.


107. Lindeberg, T., & Manson, B. (2006), *Trends and norms of HRM*, IPF - Institute for Personal- & Forhtagsutveckling AB.


