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Abstract: The attempt of this study made us to Study the Competency Mapping (CM) in Software Companies". CM is a process of categorizing the gap of a person or an employee's performance routine or professional related skills to fill the gaps through effective programs. (1) Background: Integrating competencies such as "Developing people through Empowering and Training Programs, Providing Feedback, and Rewards, Recognizing the Employee for their work, Effective Communication, Aligning right values ensuring standards, etc. to evaluate and improve the performance an employee to get desired results; (2) Methods: This study involved 100 software employees (n = 100) to state that the competencies that are mapped have a significant impact on performance.. Chi- square and one – way ANOVA tests we used to identify the relationship between two variables; (3) Results: Goal oriented people can adopt the changes and work in any kind of circumstance for better outcomes; (4) Conclusions: competencies that are mapped have a significant impact on performance. And the person who is goal oriented will try to achieve his/her goals in any type of circumstances.

Keywords: competency mapping; performance; organizational effectiveness; people; software companies; Skills of the Employee; strengths and weakness; Job Performance

Introduction

According to the (Klemp, 1980) "CM is an underlying characteristic of a person that results in effective and/or superior performance in job". Competency is different from competence where it identifies the tasks of a job and the knowledge required to perform a Job (Kandula, 2013). (Richard, 1982) Explains competency as, the capacity of a person which leads the behaviour that meets the job demands with in parameters of organizational habitat, and that, in turn brings out the desired results.

A Competency Model helps in defining required skills and knowledge of an individual at his/her Job Location. As the world's population and social structures are changing rapidly, new opportunities will arise for Human Resource (HR) practices which boost up the performance of people along with productivity. CM is one of the most popular HR practices for helping people to improve their Skills (Balaji & Vimala., 2012) Evaluating required Competencies in the firm or in the organization enriches the best quality performance management as well as reward. CM establishes the need that is essential for training that influences the Performance of people in a positive manner will bring out an extraordinary outcome. Organizational effectiveness depends upon training. An image of the organization's overall demand for training can be formed using data from consolidated appraisals, which can be viewed from the perspective of the whole organization.

The process of identifying, measuring, and developing human performance within organisations is referred to as CM and tries to

Provides feedback within the employees in order to improve performance.

Determines training requirements.

Documental criteria will be used in terms of distributing organizational rewards.

Makes the Organizational Assessment for its development

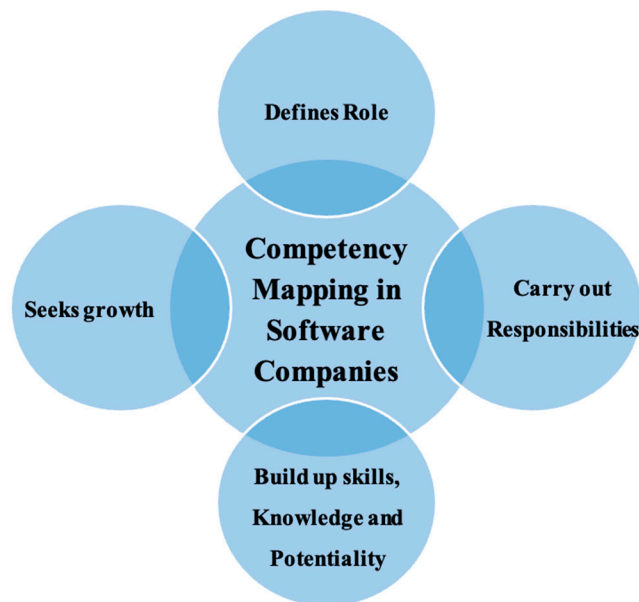Promote Two- Way communication between the employees and the administrator

Figure 1. shows CM (Competency Mapping) in Software Companies.

Software companies have implemented the concept "**Competency Mapping System (CMS)**" as an essential component of Human Resources Development for all the employees who are working in the firm to enable them:

Clearly defines their roles in the organization

Carry out responsibilities effectively

Build up skills, knowledge and potentiality for organizational as well as individuals' development

Seek for growth in the organization for career build up.

The software industry is a group of companies and people (employees) who work professionally to develop a computer software. It develops software for various reasons according to the company' or industries' needs. It is differentiated from hardware (facilitating computing services on a physical device) as it works prominently on programming activity. Introducing Internet and cloud computing changed the viewpoint of software companies, by using these components, interactions between the users have been improved on which area should the software to be developed and how developed one can be utilized. Once, software was a product that was purchased, installed, and maintained on-site. Today we are in the era of digital world. Whatever the services we are using like banking (wallets, internet banking, POS etc.), transport (Booking tickets to the destination), tourism (Booking Hotels at venue, transportation etc.) due to the implementation of technologies, these will be developed with software that have been programmed to use the application or technology.

This study evaluates how mapped competencies change the work life behaviour of a software employee. It is a systematic process that enable the employee performance to reach next level in the organization through continuous feedback, mentoring, training programs according to the requirement and other relevant programs according to the need for organizational development. This study involves 100 software employees from different companies in Bangalore region. The main insights of the study are

To study the level of significance and impact of software employee's performance in the companies.

To provide suggestion to the companies in enhancing the productivity through the performance to the companies

Study contains abstract in the beginning, Introduction of the study is covered in the above Section, Extensive Review of Literature has been covered in following section, further section covers the Research Methodology in detail and similarly Results and Discussion of the Study covered in the final section.

Review of Literature

In today's world firms are becoming project-based enterprises hence deep relationships should be maintain to influence the performance of the people in the organization at different levels, Mapping the competencies assist in measuring of the project and organizational performance (Rehman, Elrehail, Nair, Bhatti, & Taamneh, 2021). CM evaluates strength and weakness of people who are working in the organization, with accordance to them it trains an individual to improve the performance at various levels, it identifies the critical competencies for the firm as well as for a specific position (Specific Job). Incorporating the competencies that are required may lead to organizational effectiveness that improve the performance of an organization (Manju, Jayanthi, & Kowsalya, 2020) because it will clearly define the companies' requirements, and goals to their employees. It motivates the employees to learn in a better way to perform better. It clearly identifies the gaps in employees' job roles and seeks to overcome from them. It is a successful strategy through implementing these, remarkable results may arise in the future. Organizations should develop a CM based training need assessment to clearly define the competencies which were present or absent in the company because it simplifies improving the confidence level of the hierarchy to manage critical job functions effectively, and also it clearly defines the competencies which were absent or present (Vaishali & Kumar, 2004). It is very important to improve the competency gap of the employees, therefore organizations must implement modern training methods to provide practical training to their employees (V D. S., 2021) . Because organizations believing that employees are their biggest assets, so the companies are investing more on them to educate their employees to grow and change within the company to make it more profitable. Human competence is the most critical element which leads the success in the business, to adopt the continuous change organizations must develop their strategical goals, worker competence and organizational structure will help in terms of developing strategical goals (Trivedi, 2014)

CM will help organizations to recruit a right person for a right job for organizational effectiveness thus brings a productive workforce, it increases the effectiveness and efficiency in the work and also, develops the competency framework to deliver motivational facets, personality traits, cultural facets to on-the-job success. In today's modern commercial organisations, CM has emerged as an essential tool for Human Resource Management (HRM). It is of utmost significance in service-oriented businesses, as the prosperity of the company is entirely dependent on the skills and ambitions of its workforce (Raju, Bagrecha, & Kumar, 2014). Training and open communication are two effective ways to narrow the competency disparities. the set of competencies (skills and knowledge) must be developed in a professional manner to accompany the new industrial revolutions. Integrating the efforts made by companies create learning factories that provide practical experience to the employees of the organization. Creating the conceptual framework portrays the competencies needed (Skills: Leadership, Creativity, Problem Solving, self-management, adaptability, flexibility etc. Knowledge: Information and Communication Technology, Algorithms, Automation, Software development, Data Analysis etc.) (Liane , et al., 2021). The circumstances that can be fixed for organizational development. If there is any issue in the organization, that should be fixed immediately by implementing necessary corrective actions and interventions. If the firm sees a suppressed prospect; it cannot obtain what it needs or desires, interventions needed to be produced accordingly for organizational effectives thus train the people to improve their performance. These Interventions surely make it possible to take advantage of situations that are created. If there are any discordant elements available in the organization, if departments in the organizations not cooperated with each other, in these cases the interventions should be designed to restore the harmony of the firm. If the vision of the company is changed means the older one is no longer adequate. Steps to be

taken to establish a foundation for new vision in terms of systems, practices, and attitudes (Chithra, 2021).

The Research of (Jojon , Prof. Dr., Kusmintardjo , & Dr., 2016) intended to develop a model of competency related training programs. This research concluded that the product can be used by the centre of Automotive and online education and Staffs Development. (Dolors Gil-Doménech, 2021) through his study explained us the Sustainable CM should adopt the Competence of Supply Chain Management to supervise employees to attain sustainable developmental goals in the organization. Providing appropriate knowledge and abilities significantly impact the human work force. Training and motivation lead individuals in the organizations to perform a quality output at the workforce (Revathi, 2021). CM helps to bring potential skills of human resources up to extent levels, execution of it defines behavioural traits in the organizations and acts as a strategic tool to boost the performance of an employee who is working in the organization (Kataria & Sethi, 2022). Competencies carried out by an individual excels the work performance at workplace. Competencies in work force give, ultimate results at workplace especially in the software companies because there is a significant relationship between competency variables and the performance of the employees. CM determines required skills for a work position, helps to perform individual training programs to boost the performance of the organization (Dr. RAMA L, 2022). Competencies of Strategic, Personal, Managerial, Analytical and professional dimensions will affect the competent performance positively (Mona N. Shah, 2018).

Defining the Strength and weakness of an individual through CM assist in developing more accurate self-perception. It leads to increase the capacity of an individual because the CM is a methodical approach for professional development which will increase the job satisfaction of an employee (V G. & K, 2017). We can expect an outstanding performance of an individual through the CM. CM allow organizations to acquire effective leaders and shed a light on tactics to follow to balance the performance of the organization. Highly skilled and knowledgeable employees needed to achieve targets in the organization (Hasan Abdulla Al Hammadi, 2020). Hence organizations prefer competency mapping to scrutinize each individual to improve them. Competencies of an Individual directly or indirectly impacts the work environment. Especially one person's competencies indirectly affect the performance of the cluster in the organization (Rakhmawati, Satoto, & Martini, 2022). Similarly, Competency is the capacity of carrying out the roles and responsibilities in an effective and efficient manner. An employee performance we can improve through the mapping relevant competencies (increasing the level of knowledge, skills and abilities) (Rosman, et al., 2021).

Howard, H.A., Wood, N. and Stonebraker, I. (2018) conducted a research to find out how important is to mapping competencies over curriculum mapping, authors believed that curriculum mapping carries the information effectively to fill the gaps in the curriculum but the study found CM is valid method over Curriculum Mapping as it didn't cover the various gaps in academia. In a similar way The study of Ábrahám, Z., Szőgyényi, D., Eckert, B. and Németh, S. (2023) finds out the relationship between problem solving skills and socialization of first year university students. A talent management framework was established for Management, course instructors and administrators to develop collaboration with them to students in the institute. To interpret the results 546 students were examined in this study, thus formed 3 clusters i). laggers, ii). unpolished diamonds and iii). drivers' results of the study indicate incorporating talent management and competency mapping in the curriculum and syllabus designing activities is a better idea to improve an association among students and staff to improve the problem-solving skills of students. But this study aimed to find out the importance of competency mapping in software companies related to employee performance. Sudirman, I., Siswanto, J. and Aisha, A.N. (2020) conducted a research on software sector under Small and Medium sized Enterprises (SMEs) to identify the competencies in the sector. Survey conducted among 33 entrepreneurs of SME and found entrepreneurs need high level of soft competencies and moderate level of technical competencies perceived level of competencies should be developed for project management during the duration of business because project management and customer service orientation influence the business. But there were significant gaps in perceived

levels of competencies in achievement orientation, customer service orientation and project management. Elin Anita Nilsen & Anne Grete Sandaunet (2021) study reveals that the competence of project methodology arises as a key factor which influences the performance leads change implementation.

Earlier studies were conducted on different sectors, this study aimed to find out how the competency mapping fills the gaps as how it is done with other sectors in a software company. Productivity in the company improves where employees work efficiently to achieve company's goals. With no motivation in the workplace employee would not like to perform better. So engaging employee in the workplace is important for productivity, to engage employee in the workstation company provides them rewards, incentives, other allowances etc. what encourages employees to perform outstandingly at work place is always matters. CM in this case maps the required competencies for employees to perform better in the organization. Previous research showed positive impact over performance of the organization. Like other studies this study focuses on software employees and their performance with respect to the CM.

Methodology

An extensive review of literature from various sources such journal articles, books, review papers, websites etc has been reviewed for this study. We have prepared a set of self-designed questionnaires to distribute among the software employees in the different parts of Bengaluru city, to find out importance and effectiveness of competencies and mapping these in the firms (Software companies). We distributed questionnaire among 100 employees through simple random sampling method from different companies like Wipro, TCS, Infosys, Deloitte, etc. personal opinions were asked personally to know the effectiveness of the component. The data which was collected through questionnaire is analysed by using SPSS software Chi- Square Test is used to analyse the data and to interpret the results. **Why Chi- Square Test?** Because it helps in identifying the influential factors also it states the relationship between variables.

Chi- Square Test Formula

$$X^2 = \sum (O - E)^2 / E$$

- O = Observed Value
- E = Expected Value
- X^2 = Chi Squared

One-way ANOVA is typically used when you have a single independent variable, or factor, and your goal is to investigate if variations, or different levels of that factor have a measurable effect on a dependent variable.

Application/Formula of One- Way Anova

$$F = MSB/MSW$$

- F = coefficient of ANOVA
- MSB = Mean sum of squares between the groups
- MSW = Mean sum of squares within groups

Chi-square test is suitable to understand the relationship between two variables other than this test we can use Fisher's exact test. This also examines two variables but it allows for directional (confirmatory) as well as non-directional (exploratory) hypothesis-testing. Rather than Anova we can conduct Kruskal Wallis test but to analyse two independent variables Anova is best suitable than Kruskal Wallis as it compares two groups but here too two independent variables.

Hypothesis:

H₁. *The competencies that are mapped have a significant impact on performance.*

Hypothesis Testing

Questions taken for hypothesis testing
An employee who is goal oriented will consider the change and will perform well after accepting the change or not?

Table 1. shows the Sample Size of the Respondents.

Ambitious Goals * Scope of Change	Case Processing Summary					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
	100	100.0%	0	0.0%	100	100.0%

Table 2. shows the Significance values of Different Tests.

S. N	Particular	Value	Significance Value
1	Pearson Chi-Square	60.57	.000
2	Pearson's R	0.39	.000
3	Fisher's Exact Test	32.44	.000
4	Spearman Correlation	0.37	.000
5	One Way Anova	82.76	.000
6	Welch	11.45	.001
7	Brown-Forsythe	14.16	.000

Interpretation:

Since the significant chi-square value 0.000 is less than 0.05, Similarly the significant value Of R is 0.000, value of Spearman Correlation is 0.000, value of One Way Anova is 0.000, value of Welch is 0.001 and value of Brown-Forsythe is 0.000. all the significant values are less than 0.05, So we accept the alternate hypothesis. Alternate hypothesis says People who are goal oriented can work in any kinds of circumstances, they accept the changes, challenges and they always try to build up their profile in work-life. We can say that who accept the changes which are evolving the work-life and who accept the challenges can perform better than employees who don't allow them to work in different environment. So, with reference to the chi- square test we can conclude that competencies that have mapped have significant impact on performance.

Discussion

The method of classifying key competencies for a precise position within the organizational body for organizational effectiveness to enhance people performance with in the organization and then utilizing that information that has been evaluated from competencies that have classified for Appraisal, Assessment, Employment, Activity based programs in Training and Development, performance management, succession planning, and other purposes is referred to as **Competency Mapping (CM)**. An employee's performance, strengths and weaknesses can be resolute through the process of CM.

Competency while compare with competence it mainly focuses on personal attributes and aptitudes, so, designing a CM allows companies to scrutinize their employees in detail to enhance their effectiveness in terms of their work load. During the study I found that majority of the IT firms takes interviews of their employees to design CM as a Tool and few go with psychometric methods. Because to empower and train people according to the organizational needs. The tool here provides the effective feedbacks of employees it communicates effectively about their performances in the job location.(Syazali & Ilhamdi, 2022) have done research on students' performance, in the research it is found that competencies mapped for students excelled the performance, almost 98.6% of students' performance have been improved through these mapped competencies. This resulted in Software Companies too, employee's performance level is improved. This study states that CM aligns right

values by ensuring the standards with specifications also encourages employees to take an appropriate decision when there is an uncertain ambiguous environment. (Ross, Pirraglia, Aquilina, & Zulla, 2021)conducted a study on medical education to know about how competencies improve the learning capability of individual and found that Competencies which were mapped emphasized the active learning among people (need for learning is centralised to own learning). CM in Software companies address the individual's attributes on learning, it highlighted the learning importance in the study as committing mistakes is common but how extent we are learning from it to not repeat it again. CM sets ambitious goals and helps in achieving them with courage.CM allows employees to take voluntary steps to address the potential and/or existing problem in the work place. This encourages employees to work to achieve their goals.(McLaney, et al., 2022)through their study explain adopting team-based competencies involves interprofessional collaboration that results in organization development and core competencies like Leadership, Human Resources, and team behaviour etc. will be widely implemented across the organization for its development.

Conclusion

The main motive of the CM is to help people in the organization, to gain an extensive level of understanding about themselves as well as identify areas in which they can improve them in related of professional prospects. Competencies that we can acquire from particular job holders within the firm or an organization and are frequently assembled around different classes such as strategy, associations, innovation, management, leadership, risk-tackling, decision-making, emotional intelligence, and other similar topics. An accurate job profile can be crafted once the mapping of the required competencies for a specific position has been completed. It is the process of finding significant attributes and skills for each procedure and position within the firm. It can be understood as "the process of identifying key attributes and skills".

CM in organizations identifies Strength and Weakness of a person that leads potentiality of an individual. This results in organizational development. It creates a potentiality to excel the performance, results in job satisfaction, better employee retention and professional development etc. (V G. & K, 2017). Organizations use Competency Mapping as tool to identify the competencies of a personnel in the organization with specific job tasks and organizational requirements. A competency Map, helps organizations in identifying the right candidates who fit for the job, also assess the performance. it concentrates on training program to improve employee skills to enhance the productivity. Hence, it is necessary for an organization to implement effective Competency Mapping practices. For any organization, the most important resource it can have been the human resource, which forms the base for all kinds of other organizational capabilities which it can acquire in the future. Hence Competency mapping becomes a very crucial process where in we have to identify the competencies of the employees and to make use of them in the best way possible in the right time. Mapping Competencies improve the knowledge and skills of an individual to perform better at work (Suliya, Fuse, & Deshmukh, 2023).

From the hypothesis testing we can infer that the competencies that are mapped have a significant impact on performance. And the person who is goal oriented will try to achieve his/her goals in any type of circumstances. To get desired outcomes, organizations must invest on training programs to get their employees trained to give the best performance at their job. It is a vital component in investing more modern Training and Development programs it provides more technical knowledge and provides specific learning to the employees and improves the competency gap (V D. S., 2021). Providing rewards also plays a crucial role in engaging the employees, appreciate employees with rewards to encourage them to work with more confidence. Continuous feed back to the employees will help them in terms of improving their individual performances, and also gives them an insight about where they are lacking. There should be a transparent and effective communication between employer and employees this leads the work culture to meet its goals and objectives. Competency Mapping should be mandatory in firms (Software Companies) which will motivate the employees to achieve short term and long-term goals.

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