



Competency Mapping- Rejuvenating ‘Knowledge based Development’

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Abstract

Many organizations In India are working on knowledge management; yet there are smaller manufacturing units which are burdened with performance problems of employees and they are unable to focus on knowledge driven approaches. The paper presents a knowledge based development (KBD) conceptual model for organizations at inter-organizational level by using competency management. Various tools like questionnaires and psychometric tests, direct observation and job analysis were used as a part of competency mapping to collect data. The emphasis of the research lied on designing a model for assistance to the sample organizations in maintaining knowledge based focus for the various HR areas. Knowledge based development was observed on applying the model. The findings are measured and limited to individual employees only. The development in both organizational and work process level is not measured and is thus a scope of researchers to elaborate the developments at all levels.

Keywords: Knowledge management, Knowledge based management, Competency, Competency mapping

Introduction

A lot has been talked about the term ‘Knowledge’ yet a great deal remains unquestioned. Just as a whole life of an individual is too small to gain knowledge, similar is the situation of researches on the key terminology of ‘Knowledge Management’ where a good deal remains unanswered. Now; it is not only an individual who requires possessing

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knowledge but the organizations are also in dearth of it. (Vasconcelos, Seixas, Lemos, 2005) has explained that knowledge in an organization is the collection of expertise, experience and information that individuals and workgroups use during the execution of their tasks. It is produced and stored by individual minds or implicitly encoded and documented in organizational processes, services and systems. (Nonaka, 1991) in his piece of work has mentioned that in an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge. As 'Knowledge' has turned to be the core competence, the demand for knowledgeable employees has raised considerably.

The development of any country or state depends on the economical, technological, industrial and human development. The advent of industries marks an initiation to the development of the region. The very basic step to development is the development of the organizations. The paper focuses on designing a Knowledge-based Development (KBD) model which is both theoretical and applied at individual level. The development has been classified at three different levels: organizational level, process level and individual level. Individuals in an organization can be a core competence for growth and development. They should be working as an asset to the organization but many organizations faces volley of issues with its employees. KBD promotes development at all working levels of the organization as development at each level shall contribute to the development of the organization as a whole. The paper discusses knowledge based development (KBD) conceptual model for organizations at inter-organizational level by using competency mapping. Various tools like questionnaires and psychometric tests, direct observation and job analysis were used to collect data. The emphasis of the paper lied on designing a model for assistance to the sample organizations in maintaining knowledge based focus for the various HR areas. The model was applied and a knowledge based development was observed.

Utility of the study

Giant manufacturers are able to manage their employees with attractive pay packages and fringe benefits but this becomes a problem with small manufacturers. As they do not have ample resources; attracting talents becomes a major problem. Even if they are able to attract talents, retention becomes a crucial issue. Many of them are left with no solution for their employees deteriorating performance. In most of the manufacturing units, monotonous job is a common problem among employees. With the passage of time, most of the employees lose their creativity and innovativeness. This makes the employees dull and less concentrated to their work. This acts as a major cause for affecting the development and growth of the organization. There is a clear need for rejuvenating the employees, which will act as a key to the organization's performance and growth. There are various strategies adopted by different organizations to rejuvenate their employees. Organizations adopt different tools and techniques to enhance the performance and rejuvenate its employees. One such technique that has been focused in this study is 'Competency Mapping'.

The study has been conducted for small manufacturing units of India. The problems of the organizations have been studied thoroughly before designing the research. The research emphasizes on how Competency mapping technique leads to rejuvenate 'knowledge' in organizations for their development. Competency mapping has been used as tool to identify the required competencies as well as the desired level for various profiles. The competency mapping tool can be used for competency based recruitment and selection, competence development, career development, developing technical competencies, application of creativity & innovations, training and development with structured learning Plan. This acts as a base in applying knowledge based concepts like knowledge building, knowledge sharing, knowledge flow, knowledge application, knowledge acquisition, knowledge retention, creativity and innovation. (Refer Table 1.)

KBD - Support to organizations

Managing and executing knowledge for development is equally important than to just gain knowledge in organizations. Knowledge not only encompasses theory, but also includes the ability to express the knowledge gained and also enable to act it in the daily routine works for the development of the system as a whole. Though, KBD has a macro focus yet, the research attempts it to conceptualize it for development at an inter organization platform, ultimately contributing to the development at macro level. KM is an integral part of KBD as it acts as an initiation to KBD. (Hannula, Kukko, Okkonen, 2003) has expressed that KM is a managerial philosophy, which is perceivable in the practices of different organizations. KM has been expressed in numerous ways. The concept of KM necessitates storage of information and knowledge, which is open to its employees for searching critical information, knowledge or the best practices in today's economy. KM is a support to the organizations for developing a knowledge based focus. KM approach lets the organization move ahead in fulfilling its goals and leading to KBD. This approach believes knowledge is the power. It enhances the working of the organization by:

- Developing a streamlined knowledge based focus
- Acquisition of useful knowledge; which gains the competitive edge
- Optimally utilizing the knowledge information
- Providing platform for knowledge sharing
- Enhancing the knowledge of employees
- Bring about continuous improvement as per the changes

Knowledge based internal development to an organization is all about the competencies and commitment of the people within an organization i.e. their skills, experience, potential and capacity. Every organization views people as critical contributors to the development of the organization. All organizations ensure that they gain the appropriate return for the manpower which they have invested through salary, bonuses, benefits, trainings and many others.

Manpower is the most critical source of competitive advantage yet, the most difficult to measure. Organizations intend to gain positively and

for which they encash the employee competencies. Competencies have been highly talked since yesteryears, yet there are lots to discuss on. With the growing acceptability of competency based techniques, competence management has made a remarkable stand in today's organization. (Beck, 2003) justifies that competence management on a corporate level wants not only to improve the competence of its employees, but to improve their performance as well. As shown in figure 1. Competence management has a pivotal role to play and it acts as a fulcrum to both Knowledge & Performance management (PM). The concept of KM and PM together leads to the KBD in organizations where each focuses on the development of an organization as the ultimate goal.

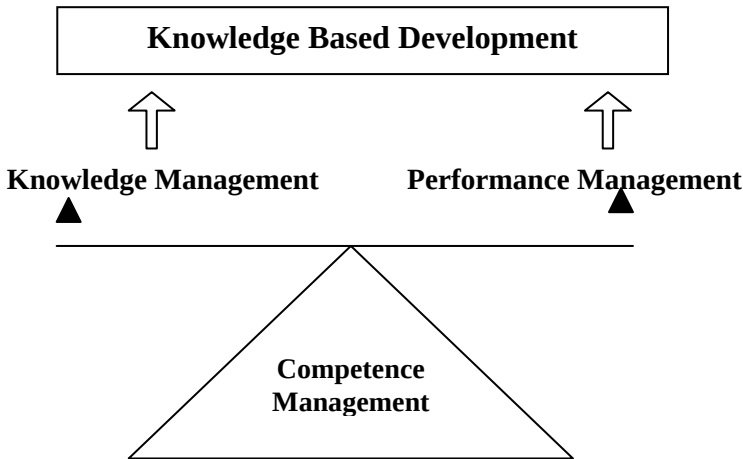


Figure 1: Pivotal Role of Competence Management

Competence Management acts as a major ingredient in handling knowledge. It helps in identifying the desired competencies as well as the required level. It also focuses on managing and developing the required competencies. Competence management is based on managing the required knowledge, skill and the ability. It also provides significant support to performance management. Performance management acts critical for an organization as most of the HR functions like compensation management, training need assessment,

internal staffing and measuring overall performance are based on it. In the earlier paragraphs we have dealt with the common opinions on KM and let us now elaborate the concept of competency on which the whole research is based upon.

Competency is a combination of motive, trait, skill, aspect of ones self-image or social role or a body of relevant knowledge. (Boyatzis, 1982) has emphasized on the concept of competency as the characteristics of people and indicates 'ways of behaving or thinking generalizing across situations and enduring for a reasonably long period of time. The outcome of possessing a competency at a particular level is the 'behavior', which is observable. Thus competencies can be judged on the behavior of an individual on specific situations. Figure 2. explains the relation of competency and performance. We can describe the relation by taking a simple example; a teacher is expected to obtain assignments submitted by the students. The competency 'Effective communication' plays a major role here. The teacher is expected

- To state the details of the assignment
- To state the submission place, date and time
- To ensure that the message must reach the students making them aware of their task of submitting the assignment

The teacher will be referred as possessing high 'Effective Communication' competency only when his/her words actually influence the students to submit their assignments on time also ensuring fulfillment of all other requisites. On having a right balance of knowledge, skill and attitude, the individual is expected to display a critical behavior which ultimately affects the performance. Here, in the above case the teacher possessing high 'effective communication' will display a critical behavior which will influence the students to submit the assignments on time as well as per the requirements. The resultant of a critical behavior is always performance by the individual. The level of performance (low, moderate or high) is always determined by the level of knowledge, skill and attitude.

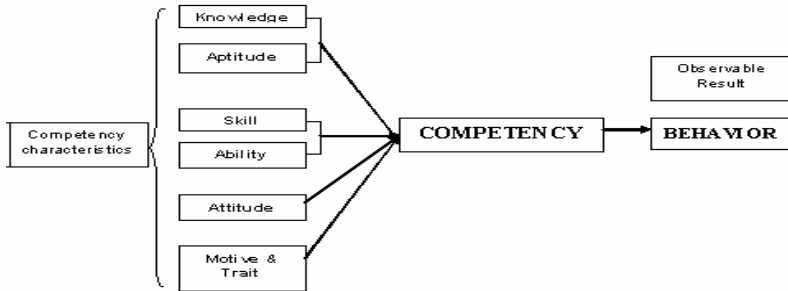


Figure 2: Concept of Competency

Competency mapping with relevance to KBD

Competence has been well recognized as extremely important for the achievement of company goals, complimentary to, for instance, core business processes, customer relationships, financial issues and so on (Hamel & Prahalad, 94, Norton,96). The research has been conducted by using Competency Mapping as a technique. It is a technique which identifies ideal behavior and the personal skills which distinguishes exceptional and astonishing performance from average. The process of identifying the required competencies is based upon the performance goal of the organization. The concept of performance acts as a base for conducting competency mapping.

The KAPPCom approach has been stated as the outcome of the result of the complete research where the focus was to understand how competency mapping can lead to knowledge enhancement for the development in organizations. The KAPPCom approach is based on the benefits of the technique of competency mapping and how it boosts KBD in organizations. It revitalizes knowledge creation; knowledge use, knowledge transfer and facilitates the development outcomes. Earlier works of (Berio, Harzallah, 2005) explained that the knowledge and the competence of the employees in organizations are substantial success factors in the world-wide competition. The KAPPCom approach emphasizes on the 5 core areas which are as Knowledge, Ability, Competencies, Performance and Participation.

Knowledge: As discussed earlier the concept of competency has visible characteristic like knowledge. An individual's knowledge is measurable and can be measured on the grounds on the level of competencies one possesses. Knowledge is acquired and builds through continuous learning. Knowledge in employees helps to gain more relevant information and adept to changes. Stimulating knowledge and implementing it at workplace is a sure way to organizational development.

Ability: Through competency mapping, the ability of an employee can also be enhanced. Ability can be measured by using various tests based on the skills possessed. On performing a need assessment using competency mapping as a tool, the employee's ability can be enhanced through need based training. Ability augmentation leads to individual development contributing to the process and organizational development.

Performance: Performance for any organization is highly important; as the growth of the organization depends on it. Competency mapping focuses on both individuals as well as organizational performance. Competency mapping technique helps in identifying the required set of competencies based on key performance indicators; leading to improved performance of the knowledge workers as well as the performance of organization as a whole.

Participation: An employee participates when one is involved and understands his need for participation. An individual employee participates when one is satisfied with the work done. Though satisfaction of an employee involves numerous factors yet satisfaction can be raised when an employee is competent for the position occupied. The employee ensures participation when one is able to perform in organization. Performance of an employee can be raised through conducting competency mapping, which in return ensures participation of employees.

Competencies: Distinguishing behaviors support in identifying the competencies of a performer and this acts as a way for others. Competency mapping simplifies the performance based focus, differentiating the high performer from the non performers among employees. (Berio, Harzallah, 2005) has explained in details that the usage of competencies is closely related to the possibility to enquire the acquired and required competencies. Competency based system of recruitment, selection, training, appraisal, compensation designing are means to development of organization.

As referred in table 1. the three application levels of KM are organizational level, process level and individual level. Competency mapping is a technique whose results can be utilized for numerous organizational functions specifically HR techniques. The pre-identified competencies can act as a support in attracting talents and add to the knowledge base. Competency mapping also contributes high to the career development of the employees, as it is based on the view of superior performance. Technical competencies can also be identified from competency mapping which enhances the performance at process level. Creativity and innovation which is also a goal of KM is ensured and practiced at the process level. Knowledge building and sharing is improved through training of required competencies. This is applicable at the individual level.

Table 1: Application of Competency Mapping to Build Knowledge Based Management Approach

Application levels of knowledge management	Knowledge based management approaches	Knowledge based development	Competency mapping usage
Organizational Level	• Knowledge Acquisition • Knowledge Retention • Creativity & Innovation	Institutional development	• Competency based recruitment and selection • Competence development • Career

			development
Process Level	• Knowledge Flow • Knowledge application	Work- process development	• Developing technical competencies • Application of creativity & innovations
Individual Level	• Knowledge building • Knowledge sharing	Employee Development	• Training on required competencies • Learning Plan

Literature Review

Numerous competency models have been developed in the recent past. The competency definition and model presented here reflects a consensus of what the leading companies and consultants in the field are talking about when they use the term ‘competency modeling’. The various models that have been referred for working on the research were the MACH model, OCSC (Office of Civil Service Commission) model and Lancaster model. (Miner, K. et al, 2005) mentioned that the competencies can be used to fulfill both the infrastructure and the workforce needs in MACH’s (Miner, Alperin, Cioffi, and Hunt) model. (Burgoyne & Stuart, 1976) has explained that the Lancaster Model of managerial competencies is a universal management competency framework. (Vathanophas & Thai-ngam, 2007) worked on OCSC model and identified an extensive list of 23 competencies in Thai public sector, Thailand Office of Civil Service Commission. (Palan, 2003) has explained the various types of competencies through the Roman Pavilion framework. He also explained that the framework is a term given to the complete collection of clusters and competencies with performance indicators.

(Berio, and Harzallah, 2005) developed the CRAI (Competency Resource Aspect Individual) model which provides a formal representation of individual competencies, both acquired and required. The enterprise model of (Vernadat, 1996) provides the reason to require a

competence and the definition of competence itself. (Yu, 1999) suggested that whenever new required competencies are unknown, a goal oriented modeling may be envisioned. Goal oriented modeling focuses on the reasons of a competence. In this research, a goal oriented vision has been used to develop a competency mapping based model. The model has been designed for identifying the required competencies and the desired level of competencies. (Karen, 2005) expressed that the knowledge workers are expensive; especially those of high caliber and creating an environment to support high productivity will take considerable time and effort. A plan for competency improvement is very essential, as identifying knowledge workers and retaining them has become an expensive task. Developing knowledge workers is more accurate and involves desired level of performance. Developing knowledge workers leads to more committed employees along with growth of every individual, who is an asset for an organization.

A lot of work has already been done by researchers in relation with competence management and knowledge management. (Hong & Stahle, 2005) has reviewed and identified the distinctive perspectives on knowledge management and the conceptual views on organizational competence. They developed the KCM approach that combines the efforts of both knowledge management and competence management to produce the overall capabilities of the whole organization for gaining efficiency in accordance with its pursued strategy. The integrated KCM Model suggests a way of considering both enabling and task-specific functions in an organization, avoiding some systematic biases. (Morgan, 1988) explains that the concept that competence encourages us to think on knowledge that is required for competent work performance. Knowledge management is an inevitable part of Competence management as the concept of competency itself speaks of knowledge, skill and abilities (KSA). (Sandber, 2000) identifies and reviews on three main rationalistic approaches to competence which are worker oriented, work oriented and multimethod oriented. The worker oriented approach has been represented as Knowledge, Skills, and Abilities (KSA) and the

personal traits required for effective performance in work. The worker oriented approach emphasizes on identifying the activities that are essential for accomplishing required tasks and then adapting them into personal attributes. The multimethod approach is a blend of both; worker oriented and work oriented approach.

(Berio, Harzallah, 2005) states that the knowledge techniques are generally useful for improving performance of competence management processes (as any tool for supporting the enterprise activities). They have suggested usage of knowledge techniques for competence identification, competence acquisition, competence assessment and competence usage. They have also explained that competence management being the management of knowledge about competence; can also take advantage from knowledge engineering.

Methodology adopted

The research comprises of identifying required competencies to develop employees by providing need based training for knowledge building. The paper clarifies a conceptual idea of how competency mapping can be used for knowledge based management approaches but it is applied for only knowledge development as a part of the research. There are various models developed for performing competency mapping in an organization. There is no one specific form of conducting competency mapping. Thus, the success or the failure of the model lies with the fact of choice of technique and the application of the techniques based on the nature of the organization.

The five stepped model designed (Figure 3.) is based on the suitability of the employers. Their issues and preferences have been considered before designing the model. Most manufacturing units have a continuous work process and every individual employee has a leading role in the process. As a result, the organizations do not appreciate a technique which is expensive, time consuming and is not accurate. Referring to the previous work of (Harzallah & Berio, 2004), only 'individuals' in organizations has been focused. Group and core competence as described by (Hamel & Prahalad, 1994), has not been

considered as it is a complete process by itself for structuring organizational strategy.

The objectives of the study was

- To measure the competency gap of the individual employees in different organizations
- To verify the changes in competency gaps; on providing a need based training

It was aimed to apply the model of competency mapping for knowledge building. The model was applied for the training need assessment through gap analysis. Training was provided based on the competency gap identified.

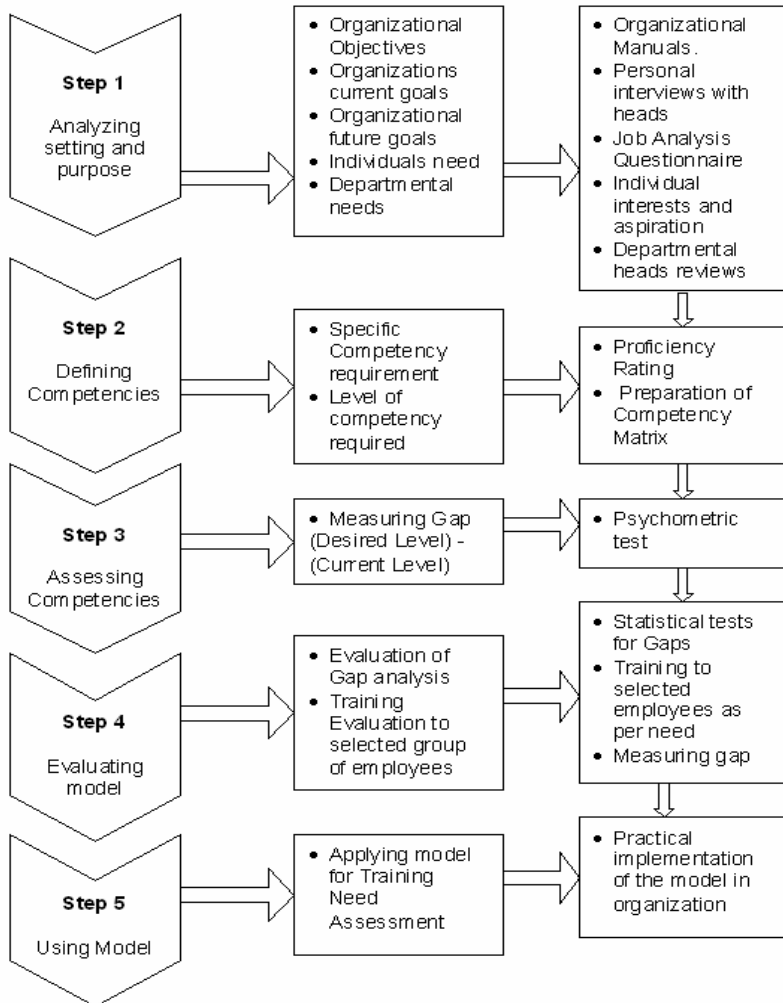


Figure 3: Competency mapping model used for the study to identify gap

The model focuses on directly interacting and interviewing with the organization's person in command to understand the current and future goals of the organization. The organizational goals have been

thoroughly assessed before structuring the competency needs of employees. The complete process of competency mapping is conducted for the benefit of the organization and no organization can benefit until the employees realize their individual gain. An employee can never be made to work until there is an interest generated to work. The preferences of the individuals in particular work reveals their interest. Most of the technical competencies can be developed in employees with an emphasis on behavioral competencies. If the right sets of behavioral competencies are focused for individual employees, it helps them to gain the technical competencies required for the particular job post. An employee, who needs to develop technical competence of operating a CNC machine, also needs to possess learning ability, practice self management while operating, quality consciousness and others. Thus, initially the technical competencies have been identified and based on which the behavioral competencies were established for a particular job post. It has been ensured that the behavioral competencies are not restricted to the technical competencies and also completely encircles the purpose of the job post.

Proficiency rating was prepared for the identified set of competencies to measure the required level of each competency. The proficiency rating acts as a support to the scorer in determining the standard level of competency. Frequency chart has been prepared to show the distribution of employees at various gap levels of the individual competencies that were identified.

The model focuses on identifying the required competencies and the desired level of the required competencies. Key performance indicators (KPI) have been prepared for each job post. The KPI's have been prepared on the thorough study of each profile along with industry expectation for a performer. Thorough interviews were conducted for the individuals as well as the superiors to identify the key performance indicators. An 80 item psychometric test was designed on the grounds of the competencies identified for which the reliability and validity was established and which was pre-administered and tested. Each competency was measured by 5 items out of which 3:2 ratio has been

maintained for positive: negative questions. The questionnaire leads to identify the current state of an individual. The gap of an individual was measured based on required and possessed. The required state of competencies was identified on the grounds of the initial mapping exercise. The current state was measured on the scores of psychometric test. These gap levels can be utilized for designing training programs, recruitment and selection of new individuals, performance appraisal, promotion, in-house hiring etc. The research focused on providing training based on the gap identified.

Convenient sampling was used to choose the sample organizations. Manufacturing units in India do not easily permit the externals to conduct research. Public organizations are traditional and have loads of paper work as a part of process. They are rigid in sharing information. There are numerous manufacturing units in India yet the sample size was only 17 based on the convenience and permission received from different organizations. The names of the companies have not been disclosed to maintain secrecy. The research has been conducted for 111 employees (supervisor and above level) Eighteen different jobs were analyzed. Besides using direct observation and interview with the employees as a technique, a questionnaire was incorporated to the head of the organization to define the performance standards and the competencies that are expected from a performer for individual job post. Job analysis questionnaire was incorporated to understand the various job profiles in depth also to identify the required competencies. Based on which the job description and specification has been prepared. The existing job description used by the company was also compared with the newly prepared one so as to ensure that the description contained every small task.

The research identified a set of 16 competencies which are as Initiativeness, Innovativeness, Effective Communication, Stress Management, Conflict Management, Openness to Change, decision Making, Effective planning, Creativity, Self Management, Proactive, Learning Ability, Quality Consciousness, Resource Orientation,

Positive thinking and Team Building. The steps involved in the research are:

- Analyzing the organizational and individual goals of the job posts
- Identifying and defining competencies along with required level (Set standards level)
- Assessing current competencies (Measure current level)
- Measure Gap (Validate the gap)
- Instruct a need based training
- Measure the transformation
- Industrial application

Gap Analysis

Data has been collected with the help of various tools as described in table 2.

Tools Used	Sample Size	Description of the Sample	Objectives of using the tool	Statistical Tests
Job Analysis Questionnaire	111	• Employees from Various Manufacturing Units	For a better understanding of the profile. To identify the required competencies for individual employees at particular jobs.	Nil
Psychometric Test Questionnaire	111	• Employees from Various Manufacturing Units	To measure the current level of competencies among individual employees.	<u>Reliability Test-</u> (Time Sampling)- Test-retest method (Content Sampling)- Split-Half method and

				Cronbach's Alpha <u>Validity</u> <u>Test-</u> Content Validity Discriminate Validity
Direct Observation	111	Employees from Various Manufacturing Units	For a better understanding of the profile and for identifying the competencies among individual employees.	Correlation Coefficient (between ratings of expert and direct observation rating by the researcher)
Checklist Method	111	Employees from Various Manufacturing Units	To identify the required competencies. Fix standards for required level of competencies among individual employees at particular job posts.	Nil
Questionnaire for Expert Opinion	17	Experts from the organizations	To identify the required competencies. Fix standards for required level of	Correlation Coefficient (between ratings of expert and direct

			competencies among individual employees at particular job posts.	observation rating by the researcher)
Psychometric Test Questionnaire	21	Closely related people of the researcher (Personally Known)	To check whether the test measures the level of competencies of an individual as observed by the researcher.	Correlation Coefficient (between psychometric scores of the individuals and direct observation rating by the researcher) <u>Reliability Test-</u> <i>(Time Sampling)-</i> Test-retest Method
Direct Observation rating	21	Closely related people of the researcher (Personally Known)	To have a thorough understanding of the individuals and their behavior	Correlation Coefficient (between psychometric scores of the individuals and direct observation rating by the researcher)
Psychometric Test Questionnaire	11	After Training Employees	To measure the difference in gap level	ANOVA- (F value) Sign test

			of competencies among individual employees after training.	(Non Parametric Test)
Training Feedback Questionnaire	11	• After Training Employees	Receive an opinion on the training imparted.	Nil

Psychometric test was initially applied on 21 closely related people of the researcher i.e., Parents, husband, cousins, friends. Initial marks were assigned by the researcher based on the observation made over the years and experiences; based on the individual's ability in handling specific situations. The psychometric test was administered on the individuals and then tested for reliability and validity. Based on the initial test- retest reliability and validity results; similar test was administered on employees of manufacturing units. Re-test was administered after a time frame of 2 months for reliability time sampling (Test- retest method). Secondary data was collected from company manuals, previous training lists of the organization, existing job description of employees, books, published papers, articles, websites and online databases.

Hypothesis I

Competency mapping model is able to identify competencies for which there is significant difference in developmental needs for various job types.

Dependent variables: Psychometric test scores for corresponding to different competencies for various job types

Independent variable: Job Types

Hypothesis II

There is significant difference in the median of gap level of competencies after a need based training

Hypothesis I tested that whether the competency mapping model identified development needs of employees for the development. Hypothesis II aimed at knowledge building on provided a need based training

Interpretation

The objective to measure the competency gap of the individual employees in different organizations is met as it distinguishes various competencies for different job requirements for different organizations. It is concluded that development needs of individual employees were identified with significant difference. This was concluded by hypothesis testing with Anova, (F-value) as a tool. (Table 3.)

Table 3. Summary of Analysis of Variance
*- denotes significant at 0.05 level

Summary of Analysis of Variance					
Initiativeness	Source	SS	df	MSS	F
	Between groups	1045.42	6	174.2367	2.63*
	Error Variance	6865.355	104	66.01302	
	Total Variance	7910.775	110		
Innovativeness	Source	SS	df	MSS	F
	Between groups	637.8243	6	106.3041	1.47
	Error Variance	7513.761	104	72.2477	
	Total Variance	8151.586	110		
Effective Communication	Source	SS	df	MSS	F
	Between groups	156.5014	6	26.08357	1.59
	Error Variance	1704.58	104	16.39019	
	Total Variance	1861.081	110		
Stress Management	Source	SS	df	MSS	F
	Between groups	919.0988	6	153.1831	3.16*
	Error Variance	5029.009	104	48.35586	
	Total Variance	5948.108	110		

Conflict Management	Source	SS	df	MSS	F
	Between groups	2434.411	6	405.7351	9.63*
	Error Variance	4378.148	104	42.09758	
	Total Variance	6812.559	110		
Change Management	Source	SS	df	MSS	F
	Between groups	1466.334	6	244.389	5.20*
	Error Variance	4879.306	104	46.9164	
	Total Variance	6345.64	110		
Decision Making	Source	SS	df	MSS	F
	Between groups	424.6676	6	70.77793	0.99
	Error Variance	7399.729	104	71.15124	
	Total Variance	7824.396	110		
Effective Planning	Source	SS	df	MSS	F
	Between groups	644.6174	6	107.4362	2.09
	Error Variance	5347.491	104	51.41818	
	Total Variance	5992.108	110		
Creativity	Source	SS	df	MSS	F
	Between groups	328.7764	6	54.79607	0.79
	Error Variance	7238.863	104	69.60445	
	Total Variance	7567.64	110		
Self Management	Source	SS	df	MSS	F
	Between groups	615.3516	6	102.5586	1.55
	Error Variance	6875.045	104	66.1062	
	Total Variance	7490.396	110		
Proactive	Source	SS	df	MSS	F
	Between groups	1097.76	6	182.96	3.33*
	Error Variance	5697.321	104	54.78193	
	Total Variance	6795.081	110		
Learning Ability	Source	SS	df	MSS	F

	Between groups	1985.372	6	330.8953	6.46*
	Error Variance	5319.655	104	51.15053	
	Total Variance	7305.027	110		
Quality Consciousness	Source	SS	df	MSS	F
	Between groups	606.7605	6	101.1268	2.30*
	Error Variance	4563.798	104	43.88267	
	Total Variance	5170.559	110		
Resource Orientation	Source	SS	df	MSS	F
	Between groups	1203.162	6	200.5269	4.14*
	Error Variance	5027.775	104	48.34399	
	Total Variance	6230.937	110		
Positivity	Source	SS	df	MSS	F
	Between groups	694.554	6	115.759	2.52*
	Error Variance	4766.221	104	45.82905	
	Total Variance	5460.775	110		
Team Building	Source	SS	df	MSS	F
	Between groups	707.6707	6	117.9451	1.92
	Error Variance	6389.266	104	61.43525	
	Total Variance	7096.937	110		

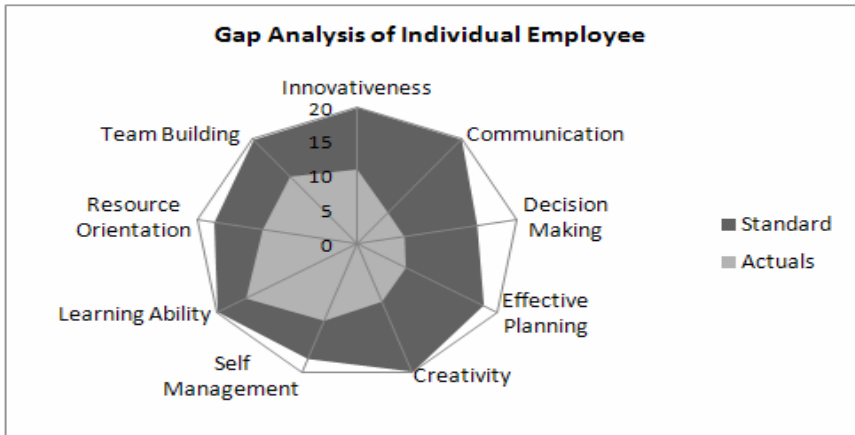


Figure 1: Gap analysis of an individual employee for the Job post (Manager -Training and Development).

Diagram 1. elucidates the gap for (Manager -Training and Development). The required competencies have been marked for the employee's job. It clearly shows that there is high gap for competency - 'Communication', 'Effective planning' and 'Decision Making' whereas a low gap exists for 'Learning ability'. Thus, training is must for the individual in the areas identified and the training content will differ as it will be based on the gap that exists. Similarly gap analyses have been done for all 111 employees. Such diagrammatic representation with report has been provided for each individual job. This gives an easy interpretation for managers to understand the need for development. The organization on conducting such individual training need assessment can form various groups of employees who has same gap levels for individual competencies and can be trained together. The training content can be prepared based on the gap identified.

It was observed that the gap level reduced on providing a need based training. This was concluded by the hypothesis testing through Sign test (A non- parametric test), Table 4. The concept was adopted from

(Aczel & Sounderpandian, 2002). Significant difference in the median of gap level of employees was observed on providing need based training to employees.

Table 4. Sign Test for Two Medians (Paired Observation)

Median - Sign test	Median of (Gap before training) GB	Median of (Gap after training) GA	GB- GA	Sign	Interpretation
Initiativeness	1	-1	2	+	Gap reduced
Innovativeness	-12	-14	2	+	Gap reduced
Communication	7	1	6	+	Gap reduced
Stress Management	-13	-13	0	0	No change
Conflict Management	-10	-13	3	+	Gap reduced
Change Management	-11	-13	2	+	Gap reduced
Decision Making	-9	-10	1	+	Gap reduced
Effective Planning	0	-1	1	+	Gap reduced
Creativity	-13	-13	0	0	No change
Self Management	-10	-12	2	+	Gap reduced
Proactive	4	3	1	+	Gap reduced
Learning Ability	-13	-14	1	+	Gap reduced
Quality Consciousness	2	1	1	+	Gap reduced
Resource Orientation	1	-1	2	+	Gap reduced
Positivity	-11	-11	0	0	No change
Team Building	-12	-15	3	+	Gap reduced

For testing Hypothesis I, Analysis of Variance was worked to establish the F- value. This was done to identify the variation in gap of individuals in different organization. This was also done to signify that the test measures the gap of an individual in varied post and in different organization as per the need of the organization. This shows

that the competencies measured relates a notable difference in the gap measured for different individuals in different organizations. In the case of the competencies; Imitativeness, Quality Consciousness, Positivity Stress Management, Conflict Management, Change Management, Proactive, Learning Ability and Resource Orientation the F value is significant at 0.05 level. Competencies like Innovativeness, Communication, Decision Making, Effective Planning, Creativity, Self Management, Team Building failed to be significant at 0.05 level. (Refer Table 3.)

Out of 16 identified competencies, 9 competencies were able to identify the development needs of individual employees with significant difference. As maximum numbers of competencies are able to identify development needs of individual employees with significant difference, thus under hypothesis I, the null hypothesis (H_0) gets rejected, proving that the competency mapping model identifies development needs of individual employees with significant difference. The model identifies these competencies to be crucial and is more often suggested for maximum number of job post in the sample organizations. This is as the sample organizations are from the same sector.

Out of 111 employees only 11 employees of one organization was allowed to be trained. For testing Hypothesis II, training was provided based on the development needs identified. The training objectives were set and the content was solely prepared based on need assessment model used as a part of the research. The content was delivered by reputed trainers from the industries. $n = 11$, $T = 8$ (Number of + ve sign), $C = 0$ (Number of - ve sign), $p = 0.50$, Since 8 is more than 5.5 ($= np = 11 * 0.5$), the tail area is to the right of 11. On carrying out the statistical hypothesis test, the binomial table is used. It is found that for $p = 0.5$, $n = 11$ that the point corresponds to a tail probability of 0.004. The tail area is binomial probability $P(T \geq 8)$ with $n = 11$, $p = 0.5$. From the binomial template, this probability is 0.004. The p- value is twice the tail area and therefore equal to $(2 * 0.004) = 0.008$. Since this p value is very small, we reject the null hypothesis (Hypothesis II).

After a close observation of Table 4, it can be concluded that there is a significant difference between the median of gap level of employees on providing need based training.

Conclusion

Actions are initiated by knowledgeable people thus knowledge needs to be enhanced for employees in organizations. (Mallikarjunan, 2005) has mentioned in his piece of work that proper training does motivate many employees to achieve excellence in his performance showing that if one ‘acts rightly’ i.e. if one subjects himself to proper training, he will achieve excellence. Competence management system is able to help the organizations to decide and plan the learning for the employees and identifies a set of possible resources for it. Competency mapping is thus a technique to identify the gap of an employee which through adequate training can enhance his performance and lead to personal development along with professional development leading to organizational development. It supports the organizations to identify talents with required set of competencies. The impact of the method at all levels has not been measured. Positive impact was measured at individual level based on which it may be concluded that there has been developments at further levels of process and organization.

Though, it has been identified from the previous literature; the relation between knowledge management and competence management, yet the work on competency mapping as a technique to contribute to knowledge management is unnoticeable. The contributions to relation between competence management and knowledge management have lead to conclusions where knowledge techniques have been referred as a support to competence management. The other opinions also reveal facts of knowledge being a part of the concept of competency. Thus, this paper focuses on competency mapping as a technique to enhance the knowledge building. Similarly the competencies identified through competency mapping can be utilized for other knowledge based approaches like knowledge acquisition, knowledge retention, knowledge flow and application at all levels like organization, process

and individual. This leads to personal, professional, individual, process and organizational development.

Knowledge based development is one of the recent approaches build to focus on the needs and performance of the organizations. It is focused to adopt continuous improvement through dissemination of knowledge. KBD embodies several distinct ideas that lead to continuous cycle of creativity and innovation. With frequent changes surrounding our life, creativity and innovation has become a part of survival strategy for organizations. The study has been able to show a path to the small manufacturing units for which the study was conducted. Thus, a knowledge based approach is inevitable and competency mapping; a technique to support it. Individual actions lead to overall enterprise development thus, the employees have been considered to be the foundation of applying KBD approach and competency mapping helps the organization to rejuvenate.

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