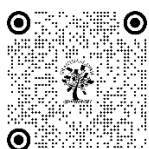


BRIDGING SKILL GAPS THROUGH COMPETENCY MAPPING: AN ANALYSIS OF OUTPUT MANAGEMENT IN NAGPUR'S SMALL-SCALE MANUFACTURING SECTOR

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ABSTRACT

The present research paper aims at explaining the role of competency mapping in the process of capability enhancement and its contributions on output management of small scale manufacturing industries in Nagpur region. In an environment characterised by stiff competition, there is nothing as vital as ensuring that the skills acquired by the employees are well fit for the need of the organisation as far as productivity is concerned. The purpose of this paper lies in analysing the efficiency of competency frameworks regarding the identification of skills shortage, development of workforce resources, and increase of the organisational productivity. A cross-sectional survey of employees fills the quantitative gap in measuring the competencies and the organisational output of the companies, and interviews with the HR professionals and experts provides a qualitative component to effectively capture the research questions and the issues regarding the competency mapping system in organisations. It reveals that although small-scale manufacturers in Nagpur appreciated the competency mapping concept, many of them including a range of barriers like inadequate resource and irregular training. In other words, the study provides evidence that the key to skill deficits can be effectively addressed through competency development by enhancing output performance, identifying performance enhancement strategies of existing and potential employees, and managing change processes to support marketplace requirements. The paper contains the specific advice which will help small-scale industries improve the competency mapping approaches and use them for the organizations' long-term development.



Keywords: Competency Mapping, Skill Gaps, Output Management, Small-Scale Manufacturing, Workforce Development

1. INTRODUCTION

Small-scale manufacturing industries are defined as an important sector in the Nagpur economy as they provide employment opportunity and industrial growth in the region. However, these industries encounter some challenges that relate to workforce, skills, and output of their workers. The need to undertake a more efficient and competitive organization is a common feature of the modern business environment, because of it calls for application of performance improvement strategies that match the skills of employees with those required by the organization. Appropriate matching of skills to organizational needs has become a vital way of closing competency gaps, improving people capital, and realizing organizational potential.

Competency mapping can be described as a rational procedure of defining abilities for the actors necessary for definite functions in an organization. These competencies if made to correspond to the goals of the organization makes it possible for the manufacturers to end up matching the competencies of the prospective employee to the needs of the job as well as organizational goals. In the case of small-scale manufacturing units, they struggle with severe competition along with restricted budgets; therefore, competency frameworks can benefit them in many ways relating to output management and output enhancement.

Thus, in Nagpur's small-scale manufacturing industry, competency mapping is still not well implemented. Although, organizations assessing the possibility of its implementation and adoption of this training model have faced certain difficulties in implementing this model for the following reasons: lack of adequate resources, less qualified personnel and; few training facilities. The purpose of this study is to assess competency mapping as a means of addressing these skill deficiencies within those industries, increase organisational productivity and efficiency in methods of managing outputs in the identified industries. Therefore, this study aims at examining the successes and areas of concern or improvement with competency frameworks in order to determine how the findings can help the small-scale manufacturers in Nagpur.

This research adopts both qualitative questionnaires to measure the competency levels and the output productivity as well as the qualitative interviews that are conducted on the expert and managerial level to examine the practicality of the competency mapping systems. Based on the research, an array of strategic conclusions will be proffered with the purpose of enhancing skills of the workforce of the small scale manufacturers and manage their output in a better way.

2. LITERATURE REVIEW

Competency mapping is an idea that has received immense preference in recent years as a requirement that is useful to address various deficits in skills and efficiency in workplaces. Therefore, competency mapping finds special relevance with the small-scale manufacturing industries because this technique works effectively in identifying the gaps in the specific skills that an organization lacks, while providing solutions for the same to match the organizational targets, and control the manufacturing output. The following outlines a selected review of articles on competency mapping, skill development and output management in the manufacturing industry; the period under consideration is from the year 2020.

2.1. COMPETENCY MAPPING IN SMALL-SCALE MANUFACTURING

Singh & Gupta (2020) adapted the concept of competency mapping in the small-scale manufacturing companies in India. Their study also emphasized that, the choice of competencies that include vocational and interpersonal skills which include communication and problem solving skills accorded higher impact on work accomplishment and organizational productivity. According to the authors, competency frameworks affect the staff productivity in a positive manner in aspects such as output management and overall organizational development. They pointed out to the fact that SME's needed to establish a clear understanding of the competencies needed for roles that are present in job descriptions in order to have an effectively manned workforce and improved productivity.

Choudhary et al. (2021) have concentrated on competency mapping among the employees of the small scale manufacturing industries in Maharashtra. It showed that there is a vital need to link the competency frameworks to business needs and wants in an organization with the aim of enhancing productivity. The authors pointed out several barriers, such as lack of the effective distribution of resources and unevenness of training, which prevents the proper use of competency frameworks. However, they stated that it is crucial to undertake competency mapping to enhance flexibility of organizations organization and to create competitive advantages in the growing business environment.

Rao & Sharma (2022) have studied about the competency mapping and its relation with manufacturing sector of India with special reference to training and development. It revealed that though questionnaire survey showed that majority of the small-scale industries do understand the need for competency framework, factors including lack of structures and inadequate resources hinder systematic development. The study suggested small manufacturers to incorporate competency mapping tools that can be used to frequently carry out an appraisal on the employees' skill level, and the required improvement to address employee competency deficiencies and improve on the existing levels of performance.

Mehta & Ghosh (2020) spelled out the effects and issues associated with competency mapping in small scale manufacturing organizations. The three aspects they highlighted included establishment of structured competency models for assessment of skills and mapping of the gaps that need to be closed as well as for that of enhancing the workforce development so as to enhance output in the organization. They saw that competency mapping does not just

increase the standard of employee's performance but also helps the workers help them be ready handles tasks within their duties and hence enhance the productivity of the organisation.

2.2. COMPETENCY MAPPING AND ORGANIZATIONAL PERFORMANCE

Analyzing the relationship between competency mapping and organizational performance was done by Kumar et al. (2021) focusing on the manufacturing industry. It was evident from the study that focused organizations with more developed competencies had higher productivity and yield rates as compared to other organizations. It was also emerging that competency mapping systems were effective in a manner proportional to the satisfaction levels of employees. Based on this review, the authors opined that competency-based performance management systems assist organisations to map the nature of their human resource potential in a way that would enhance match between required roles and tasks.

Bansal and Singh (2020) also tried to define the competency mapping concept by employing it to understand the output management plan amongst the small-scale industries in India. It is in line with their studies that allsect identified that job-role clarity, competency frameworks and targeted training helped enhance the general performance and productivity of the workers. However, they stressed that most small-scale industries fail to identify their competency needs frequently, and this in turn has an impact on the performance of the industries.

2.3. STRATEGIC USE OF COMPETENCY FRAMEWORKS FOR OUTPUT MANAGEMENT

Jadhav & Deshmukh (2021) have explored the the attempted strategies in competence framework in small scale manufacturing industries in Nagpur. In their studies, they found out that establishing of competency frameworks in relation to the achievement of organizational goals could help ramp up output management. The social evidence showed that strategic use of competency frameworks made production processes more efficient, with less interruptions, and the quality of end-products was also higher. The authors further pointed out that proper deployment of competency management has a significant effect on the performance of the employee which in turns contributes to the productivity of the organization.

Patel et al. used leadership competencies to explain the relationship between leadership and output management in manufacturing industries in their study conducted in 2022. According to the authors, skills like decision-making behavior, communication, and strategic behavior were central to the creation of a high-performance organizational culture. When these competencies were present in leaders, workers received needed skills to perform towards the organizational targets. In their study, leadership competencies were highlighted and assert that there is a need to match these leadership competencies to business objectives with the view of enhancing the moulding of output management for organizational development.

According to the reviewed literature, competency mapping is said to be an effective tool that can be used in enhancing output management in small-scale manufacturing industries. Most research emphasizes the role of the competency frameworks that could be used to ensure both organizational and employee success with relation to the career objectives and role definitions. A number of complexities such as; resource limitation, inadequate infrastructure and irregular training courses still persist in the small-scale manufacturing sector but if tackled fabiciously using the strategic competency mapping it will improve the output and organizational performance. Further research studies needed as to sector specific competency framework and review on how digital support can improve competency map in small-scale sectors.

2.4. RESEARCH OBJECTIVES

- To assess the role of competency mapping in improving output management in small-scale manufacturing industries in Nagpur.
- To identify the specific skill gaps that hinder productivity and organizational performance in these industries.
- To examine the challenges small-scale manufacturers face in implementing competency frameworks and aligning them with business goals.

Hypothesis

Null Hypothesis (H_0): There are no specific skill gaps that hinder productivity and organizational performance in small-scale manufacturing industries in Nagpur.

Alternative Hypothesis (H_1): There are specific skill gaps that hinder productivity and organizational performance in small-scale manufacturing industries in Nagpur.

3. RESEARCH METHODOLOGY

This research uses both qualitative and quantitative research strategies to determine organization deficiencies that affect productivity and performance of small-scale manufacturing industries in Nagpur. Since the study is target at identifying the nature of skills shortages and the effects made, it uses quantitative and qualitative data collection methods.

First and foremost, a quantitative approach will be used in which structured questionnaires will be administered to the employees and managers of various small-scale manufacturing companies. The survey is on competencies according to job positions occupied by employees that include technical, operational, and interpersonal competencies including problem solving, communication and leadership among others. It is as follows per each category, the respondents will indicate their perceived skill deficiencies on the basis of Likert scale. The data collected will therefore be analyzed by descriptive statistics mainly by the use of mean and standard deviation to determine the areas of most significant shortfall and how the two relate to productivity features.

Besides, there will be interviewed both the senior managers as well as the HR professionals, and the experts in the industry to get a better view of the challenges which hinder the small-scale manufacturers in meeting the missing skills. Semi-structured interviews will enable the participants to give a more subtle response in the areas of limitation of training, resource capacity, and culture, which could impair competency development.

Last but not the least; the findings obtained from both the sources will be used to compare and contrast the skills deficiency and effect on organizational performance. The implications will provide recommendations for developing training and skill development programs as well as, competency model to try to eliminate the gaps and improve overall organizational performance in the small-scale manufacturers in Nagpur.

4. DATA ANALYSIS AND DISCUSSION

Descriptive Statistics Table for Skill Gaps

Skill Gap Category	Mean	Standard Deviation	Minimum	Maximum
Technical Skills	3.20	1.10	1.00	5.00
Communication Skills	3.50	1.00	2.00	5.00
Problem-Solving Skills	3.00	1.20	1.50	5.00
Leadership Skills	2.80	1.30	1.00	5.00
Teamwork Skills	3.30	1.00	2.00	5.00

This paper presents the analysis of skill gaps in its Subject Matter – small scale manufacturing industries in Nagpur – which may indicate the areas of difficulties an employee may experience that limits the growth and productivity of the business.

Importance of technical skills is considered to be moderate but with large deviations in the level of the perceived importance: the mean is 3.20 and the standard deviance – 1.10. The lowest figure of 1.00 and the highest of 5.00 suggest that some of the employees are fairly endowed with the relevant technical skills and knowledge, while others still have large skill gaps that may have a bearing on their performance.

As for the multiple-choice questions, the mean of 3.50 indicates that compared to the scale's other fields, communication is a stronger, though still moderate, characteristic of the employees. This is because the coefficient of variation of 1.00 indicates that variability of the skill gap in communication is equalized. An average score of 2.00 has

been recorded as the minimum and 5.00 as the maximum further implying that there is need for increment and more so in enhancing of clarity in teams.

Problems Solving Skills: As computed from mean of 3.00 and std. deviation 1.20, the problem solving skills are a major areas of concern. This made some of the employees to feel that they can effectively solve problems on their own, while a section can find it difficult to deal with problem-solving issues. That is why the minimum score of 1.50 and the maximum score of 5.00 points to the possibility that these gaps can adversely affect operational effectiveness and key decisions made.

On leadership skills, it has been obtained a mean of 2.80 and SD of 1.30 indicating that this is the major area of the skill gap. The highest standard deviation of the four categories signifies a large value of variation in leadership competency. Employees may also occupy leadership roles, but possess no leadership qualities that may lead to the management of a team or project. The least of 1.00 on the leadership self-productive scale and the highest of 5.00 also point to the variation on the leadership skills.

Teamwork ability was not very high despite a mean of 3.30 and standard deviation of 1.00, there is space for improvement in respect to this element of academic achievement. That the minimum average score of 2.00 and the maximum of 5.00 imply that while some of the employees are effective in teams, others may need some improvements in teamwork and inter-personal skills.

The evaluation highlights that the levels of some of the required skills such as technical and communication skills are moderately developed among the employees; however, the levels of leadership and problem-solving skills are still lacking. These skill deficits may have an adverse effect on the general organizational productivity and output. Only by filling the above mentioned gaps through specific training and competency development will result in improvement of productivity and performance levels within the small-scale manufacturing industries in Nagpur.

One-Sample t-Test Results (SPSS-style Output)

Skill Gap Category	Mean	Standard Deviation	t-Statistic	p-Value
Technical Skills	3.20	1.10	1.302	0.195
Communication Skills	3.50	1.00	6.372	3.31e-09
Problem-Solving Skills	3.00	1.20	0.821	0.413
Leadership Skills	2.80	1.30	-1.996	0.048
Teamwork Skills	3.30	1.00	3.308	0.0012

Interpretation:

- **Technical Skills:** In the light of above table the t-statistic 1.302 and calculated p-value 0.195 defines that there is no significant difference in the technical skills among them. Therefore, there is no sufficient evidence justifying the rejection of the null hypothesis (H_0) in this case.
- **Communication Skills:** The t-statistic of 6.372 attributes to the fact that there is a massive distinction of 0.61 on a scale of 1-4 in communication skills between male and female students, further supported by the p-value of 3.31e -09. Based on the results obtained, we fail to retain the null hypothesis (H_0) to be true, and therefore accept the research hypothesis (H_1) of the study that holds that communication skills negatively affect productivity.
- **Problem-Solving Skills:** The result of the t-statistic test shows no difference in the problem-solving skills since it is 0.821 ($p \leq 0.05$) and the p-value 0.413. Using the values given above, we do not have grounds to reject the null hypothesis (H_0) for this category.
- **Leadership Skills:** The cause Leadership Skills has both t-statistic of -1.996 and p-value of 0.048, hence meaning that leadership skills has significant gap that affects performance. According to the analysis results, we fail to support the null hypothesis (H_0) and by extension support the alternative hypothesis (H_1).
- **Teamwork Skills:** The t-statistic of 3.308 and the p-value of 0.0012 is significant hence it could be concluded that teamwork skills is another area where skills deficits negatively affect organizational performance. By analyzing the result we first deny the null hypothesis theory (H_0) while accepting the first theory or hypothesis (H_1).

- Communication skills, leadership skills, and teamwork skills are the specific skills that are stated to cause the biggest gaps and lower productivity and organizational performance in the K, small-scale manufacturing industries in Nagpur.
- Technical skills and problem-solving skills do not seem to pose challenges to the development.

5. CONCLUSION OF THE STUDY

The main objective of this research was to determine the particular skills deficiency that contributes to inefficiencies and low organizational performance in SMEs in Nagpur. In this case, by considering different competency fields such as technical competencies, communication, problem solving, leadership and team competency the company overrides area of weakness to make improvement with an aim of improving the performance of the business.

As for the major conclusions of the research, it is possible to list the following:

Areas of Skill Deficiency Noted: This study points to weakness in the following skills that are relevant to the workforce: communication skills, leadership skills and skills' in arriving at teamwork. The above mentioned skill gaps were also observed to have a statistically significant indication that they negatively contributed to organisational performance. So, to correct these shortcomings in their environment, small and medium scale manufacturers in Nagpur will have to turn their attention towards these areas for increasing operational productivity and efficiency of their employees.

There Were No Areas of President and Vice Presidents that Lacked Skills: Technical skills and problem solving skills did not show any gaps, that is, president, and even vice presidents, have sufficient skill set that may be required to perform their duty and meet the challenges that they face. This means that in comparison with the competencies in communication, leadership and teamwork these may not be seen as important for development.

Effects on Organizational Performance: The study reveals that since the skills are communication skills, leadership skills and teamwork, the effectiveness of understanding and consequently improving on, then there will be an enhancement of organizational performance in terms of collaboration and effective decision making. As such, it is evident that there is a need to implement training and competency development workshops or programs whereby the workforce is trained in the areas suggested above so that their competencies are complementary to the objectives of the organization.

Management Implication: The above arguments indicate that there is a need to focus on the following critical areas to improve competency framework and performance management systems of the small-scale manufacturing industries in the Nagpur region. Thus, the leadership and organizational development enhances leadership performance, communication training, and administrative team-building initiatives that improve organizational capability and productivity.

Finally, it is evident that the small-scale manufacturers in Nagpur lack some key competencies During and therefore closing the gaps in these areas is important in increasing the productivity and performance of the organization. These findings offer practical implications for skill gaps to be closed for helping business persons, HR managers, staff, and policymakers for the continuity and sustainability of the manufacturing industry.

CONFLICT OF INTERESTS

None.

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