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Original Research Paper

Management

"EXPLORING POTENTIAL OF SMES FOR SMART FACTORY WITH REFERENCE TO PCMC-PUNE REGION."

Dr.Hemant A. Anbhule

School of Management (PG) Dr. Vishwanath Karad MIT World Peace University, Pune.

ABSTRACT

Te term Industry 4.0 depicts the continuous unrest of assembling industry all throughout the planet. Huge organizations specifically have quickly accepted the difficulties of Industry 4.0 and are presently working seriously on the presentation of the relating empowering advances. Small and medium-sized enterprises (SMEs) face the obstacle of having neither human nor financial assets to efficiently research the potential and dangers for presenting Industry 4.0. In any case, in the majority of the nation's SMEs structure the foundation of the economy, they represent the biggest portion of the total national output and are moreover significant managers. In this regard, the difficulties, openings, and necessities of Industry 4.0 analyzed specifically for SMEs based at Pune, Maharashtra, hence making ready for the computerized change of conventional SMEs into shrewd production lines.

KEYWORDS : Industry 4.0, Assembling Industry, Organizations, SMEs & Human.

Theoretical Background

About SMEs:

Small and Medium Enterprises (SME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last five decades. SMEs not only play crucial role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in industrialization of rural & backward areas, thereby, reducing regional imbalances, assuring more equitable distribution of national income and wealth. SMEs are complementary to large industries as ancillary units and this sector contributes enormously to the socio-economic development of the country. SMEs also play a significant role in Nation's development through its high contribution in domestic production, significant export earnings, low investment requirements, operational flexibility, location wise mobility, low intensive imports, capacities to develop appropriate indigenous technology, import substitution, contribution towards defence production, technology–oriented industries, competitiveness in domestic and export markets thereby generating new entrepreneurs by providing knowledge, training and skill development .

About Industry 4.O:

Industry 4.0 is a gradual combination of traditional manufacturing and industrial practices with the increasing role of technology.

Industry 4.0 is not a new technology nor it is business discipline but in fact, a new approach to achieve results that were not possible ten years ago. Thanks to advancement in technology.

Globalization has forced many nations to adapt Industry 4.0. The fourth industrial revolution holds the promise of integrated digital and physical technologies that improve organizational operations, productivity, growth, and innovation. Those who have tried this approach have benefited a lot.

Industry 4.0 revolution is based on innovation and use of technology. It poses risks but offers tremendous opportunity for new products and services, better ways to serve customers, a new type of jobs and completely new business model. As with previous industrial revolutions, the impact of these changes has the potential to ripple across industries, businesses, and communities, affecting not just how we work, but how we live and relate to each other.

The 4th Industrial Revolution, leverages technological advancements in both the physical and digital world to increase manufacturing capability and efficiency. The 4th Industrial Revolution introduces **Cyber Physical Systems** into the manufacturing world and leverages the internet as a key media for sharing and collecting information, as well as driving distributed, intelligent decisions back to physical processes introducing a **Smart** ecosystem.

The key components that allow Industry 4.0 to come to life are:

- **Cyber-Physical Systems**: are electro mechanical devices with connectivity and digital communication capabilities
- **Internet of Things**: is the network of physical objects that use sensors to compute data and embedded connectivity to exchange it over the internet. Typically the internet of things refers to consumers products which are often not equipped with actuators (as a cyber-physical system)
- **Internet of Services**: refers to the usage and combination of IOT devices & applications to provide services to end users and to other components of the ecosystem.

Industry 4.0 is designed to make manufacturing more efficient, but it also creates the foundation for new business models for the industry. Industry 4.0 instead, focuses on smart equipment, that can interact together and make real time, expert and aware decisions. Those smart equipment, integrated, work together to give life to smart factories.

Benefits of Industry 4.0:

- Increase Productivity
- Manpower Saving
- Advanced Technology
- Technological Expertise
- Improved and Continuous Quality
- Accurate and Fast Decision Making
- High Customer Satisfaction
- Greater control on Manufacturing Processes
- International Competitive Quality

Objectives of the Study

1. To study about Industry 4.0
2. To create awareness about Industry 4.0 in SMEs
3. To know the challenges of SMEs to implement Industry 4.0
4. To develop importance of Project Management for cost effective measures to get financially competitive business

RESEARCH METHODOLOGY

The term research is composed of two words "Re" & "Search" which means to search again, Research for new fact or to modify the existing fact.

Research methodology is one of the important chapters which

help the researchers to do the research project work in a systematic way.

Research is a systematic way of solving the problems. Research is an original contribution to the existing stock of knowledge making for its achievements. Research is the pursuit of truth with the help of study, interpretation and comparison and experimenting. In researchthe various steps are generally adopted by the researcher in studying research problem along with the logic behind them. In short the research is the search for knowledge through objective and systematic methods of findings solution of the problem.

Research is the process which includes defining and refining problem, formulating hypothesis or suggested solutions collecting, organizing, & evaluating data; making deduction and reaching conclusion and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

Definitions:

- "Research as a systematic effort to gain new knowledge"
  Redman & Mary
- A careful investigation or enquiry especially through search for new fact in any branch of knowledge.
  Advance Learner Dictionary
- "Research is nothing but an investigation of new facts or verifying old facts with help of scientific knowledge is called research".
  P.V. Young

Since it is not possible to collect the data from all the companies, a sample of 25 companies was selected. An effort has been made to cover Small and Medium scale enterprises in PCMC area.

This project is based on both primary and secondary data. The type of research used is **Descriptive type with qualitative approach**.

There are two main types of data: a) Primary Data & b) Secondary Data

SOURCES OF DATA:

- **PRIMARY DATA:**

It is the data which is collected for once own research purpose. The primary data was collected through questionnaire and formal discussion and it is interpreted. The questions were framed so as to gain maximum firsthand knowledge from companies, which were analyzed in order to arrive at suitable conclusion.

The primary data was collected through:

- Survey, drafted with the Questionnaire: A questionnaire was designed by researcher which includes 20 questions on Project Management and Industry 4.0.
- Personal Interview:formal discussion was held with various executives in the companies. This helped researcher to gain additional information, not only related to subject of my project but also other functions and activities.

- **SECONDARY DATA**

The secondary data used in this project is by studying the concept of Industry 4.0 from different websites and presentations. During this project Handout of company (Project Management Institute, Pune) was referred.

Type of Research:

The type of research used in the project is Descriptive Research.

Sampling:

- Population –Any set of people or events from which the sample is selected and to which the study results will generalize.
- Sample – A group of people or events drawn from a population. A research study is carried out on a sample from a population.The goal is to be able to find out true facts about the sample that will also be true of the population.
- Type of sampling – The type of sampling used is this project is convenient sampling and the questionnaire was filled from the Proprietors or Managers

COLLECTION OF DATA:

For primary data collection 25 companies were visited. Questionnaire was filled up by Managers or proprietors.

SAMPLE SIZE:

25 small and medium scale enterprises in PCMC area.

Respondents: 25 SMEs

DATA ANALYSIS:

Data analysis is represented by charts, tables.

DATA INSTRUMENTS:

Data was collected from the manager or the proprietor of the organization.

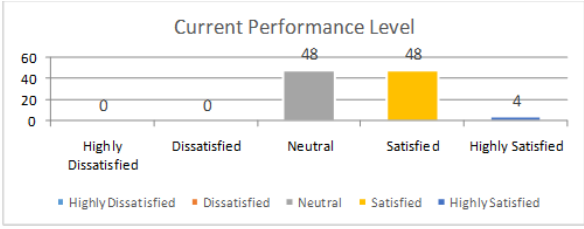
ANALYSIS OF DATA:

The data collected through questionnaire was analyzed so as to draw some inferences regarding the promotion of Project Management Institute. There are various methods to represent and analyze the data. The use of Pie charts, bar charts was common for the data presentation and analysis. Pie charts & Bar charts is the simplest and fast method for data presentation and analysis. Hence, Pie charts and bar charts are prepared for data representation and analysis.

Data Analysis

Q.1 Are you happy with your current performance in terms of productivity, level of performance and effectiveness of overall performance?

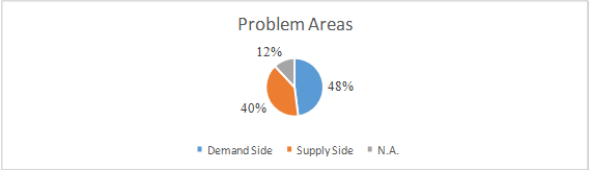
Graph No 1:



Interpretation: 48% SMEs are satisfied with their current performance level and only 4% SMEs are highly satisfied with their current performance level.

Q.2 Every business has two sides i.e. Demand side and supply side. Which side of your business you think is facing problem?

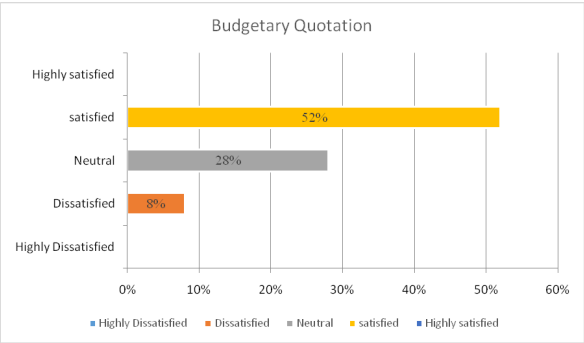
Graph No 2:



Interpretation: Most of the SMEs facing problem for demand side i.e. 48% and some are facing problem for supply side i.e. 40%.

Q.3 overall clarity about requirements before the start of the project and budgetary quotation is appropriate?

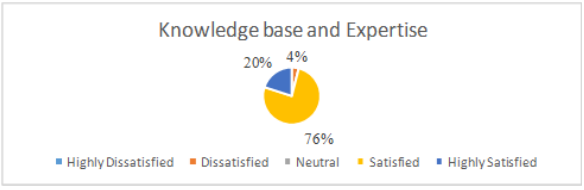
Graph No 2:



Interpretation: The result shows that 52% SMEs are clear about requirements before the start of the project and budgetary quotation.

Q.4 Do you have knowledge base and expertise in your business application?

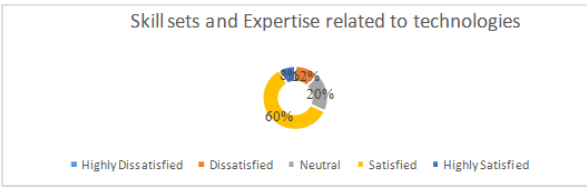
Graph No 4:



Interpretation: 76% SMEs have knowledge base and expertise in their business application, 20% SMEs are highly satisfied with their available knowledge base and expertise.

Q.5 Is the skill sets and expertise related to technologies used are adequate?

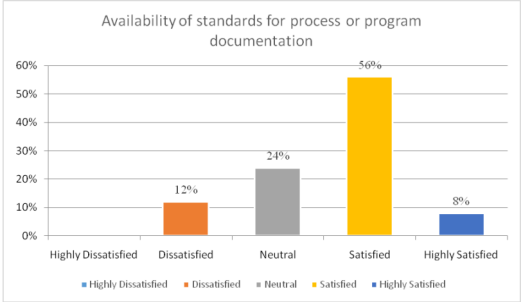
Graph No 5:



Interpretation: 60% SMEs are satisfied, 8% are highly satisfied and 12% are dissatisfied with skill sets and expertise related to technologies used in their organization.

Q.6 Availability of standards for process or program documentation are adequate?

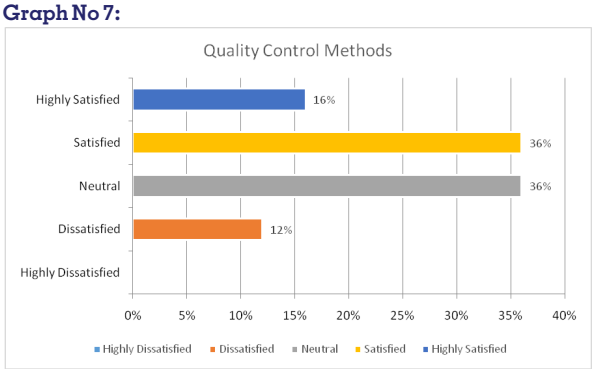
Graph No 6:



Interpretation: 36% SMEs have opportunity to improve their standards for process or program documentation.

Q.7 Availability of current quality assurance and quality control methods are adequate?

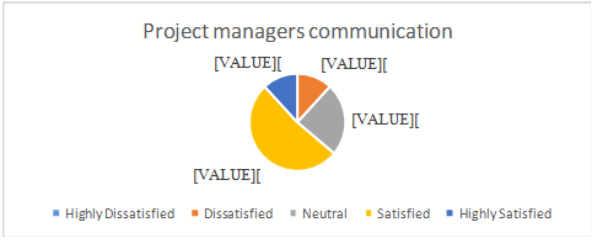
Graph No 7:



Interpretation: 48% SMEs need to improve their current quality assurance and quality control methods

Q.8 Project managers communication based on your experience is effective?

Graph No 8:



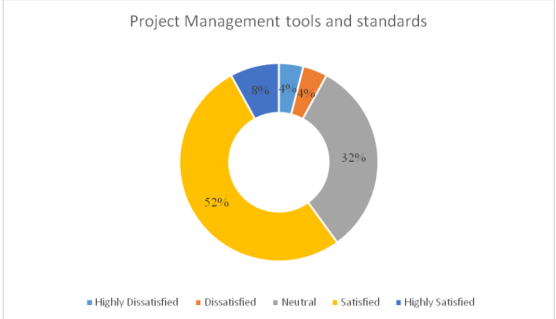
Interpretation: 64% SMEs are satisfied with their project manager's communication.

Q.9 Project Management tools and standards available for planning function are effective and adequate.

Table No9:

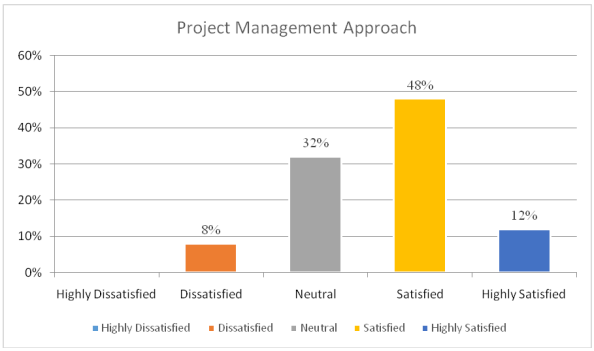
Sr. No	Particulars	Frequency	Percentage
1	Highly Dissatisfied	1	4
2	Dissatisfied	1	4
3	Neutral	8	32
4	Satisfied	13	52
5	Highly Satisfied	2	8
	Total	25	100

Graph No 9:



Interpretation: 40% SMEs need to improve their Project Management tools and standards available for planning function, 52% SMEs are satisfied and 8% are highly satisfied with their current Project Management tools and standards available for planning function.

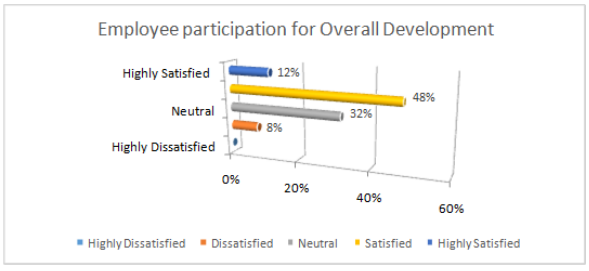
Q 10.Project by Project methodology will help to have process, people and technology Improvements?



Interpretation: 60% SMEs says that Project by Project methodology will help to have process, people and technology Improvements and 40% are not sure about that.

Q 11.Employees understand overall vision and actively participate in its development.

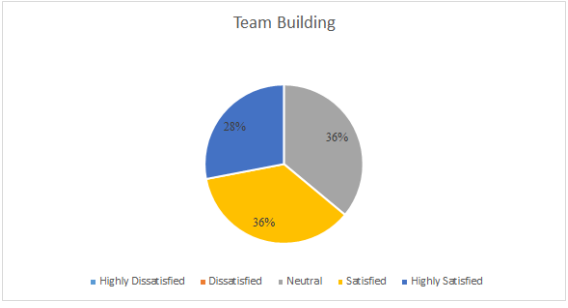
Graph No 11:



Interpretation: 60% SME's employees understand overall vision and actively participate in its development whereas 40% SMEs have opportunity to develop with their employees.

Q 12.My team is disciplined (knowledge sharing, process compliance, friendly atmosphere etc.)

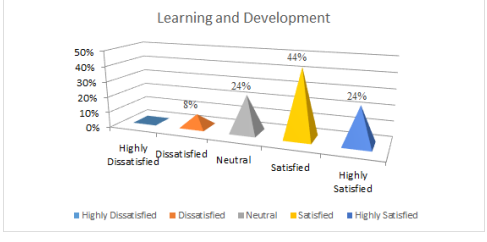
Graph No 12:



Interpretation: 64% SMEs give importance toknowledge sharing, process compliance, friendly atmosphere in their organization.

Q 13 We provide valuable training, adequate time, and budget to deliver on our vision and objectives.

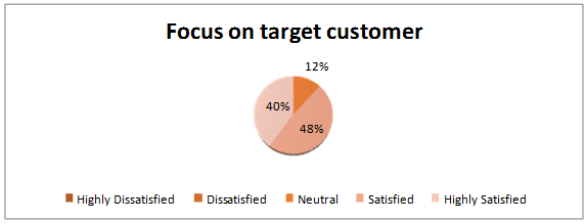
Graph No 13:



Interpretation: 68%SMEs provide valuable training, adequate time, and budget to deliver on their vision and objectives.

Q 14 Focus on target customer and outcome, and build organizational plan based on those will help to retain customer

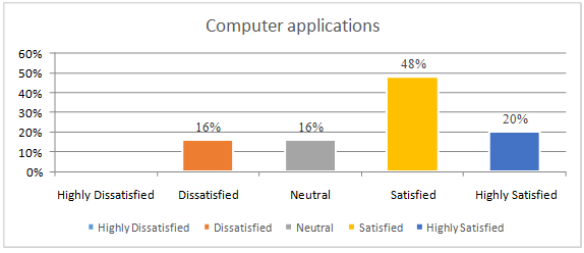
Graph No 14:



Interpretation: 88% SMEs focus on target customer and outcome, and build organizational plan based on those will help to retain customer.

Q 15.Computer applications monitor the use, consider the factory's current projects, and provide an accurate estimate of what is needed for the next project

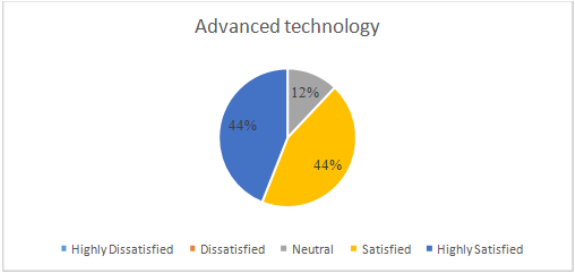
Graph No 15:



Interpretation: 68% SMEs believe that computer applications monitor the use, consider the factory's current projects, and provide an accurate estimate of what is needed for the next project and 36% SMEs not sure about that.

Q 16.Industry 4.0. Advanced technology allows SMEs to be precise with their materials and resources overall.

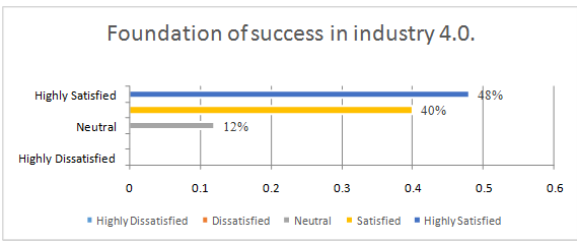
Graph No 16:



Interpretation: Result says that 88% SMEs believe that Industry 4.0. Advanced technology allows SMEs to be precise with their materials and resources overall.

Q 17.Clarity, schedule, road map in communication will be the foundation of success in industry 4.0.

Graph No 17:

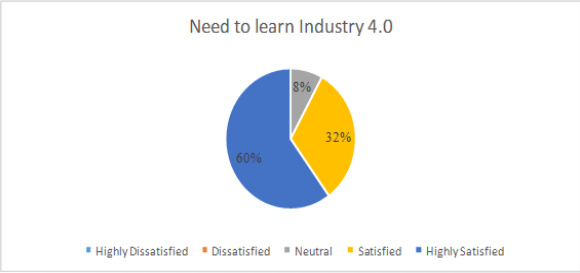


Interpretation: 88% SMEs believe that Clarity, schedule, road

map in communication will be the foundation of success in industry 4.0.

Q 18.We need to learn Industry 4.0 revolution for sustainable business

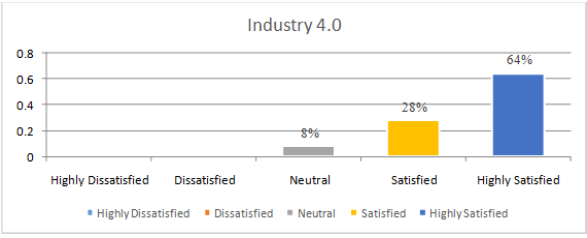
Graph No 18:



Interpretation: 92% SMEs believe that they need to learn Industry 4.0 revolution for sustainable business.

Q 19. I believe Industry 4.0 will make humans, machines, and companies more efficient and powerful.

Graph No 19:



Interpretation:92% SMEs says that Industry 4.0 will make humans, machines, and companies more efficient and powerful.

Findings

- It is revealed that SMEs have the opportunity to improve their business processes.
- It is seen that SMEs have the opportunity to improve in terms of planning and budgetary provisions.
- It is revealed that having knowledge base and expertise will give SMEs better and efficient results.
- It is revealed that availability of technology is not enough but the skill sets and expertise to use that technology are needed.
- It is seen that standards for process and program documentation assist SMEs for future decision making.
- It is revealed that Implementation of quality assurance and quality control methods will result into high customer satisfaction and also will increase profitability.
- It is revealed that when employees understand the vision and works towards the fulfillment of its objectives and are provided with valuable training and adequate time, they take 100% efforts to complete the work which will automatically improve quality.
- It is revealed that Focus on target customer and outcome + Organizational plan accordingly = Retention of customer.
- It is seen that Computer applications monitor the use and provide basis for the accurate estimation of next project.
- 4.0 advanced technologies assist SMEs to be precise with their materials and resources which will reduce the wastage of resources and saves cost.
- 4.0 will reduce the physical human efforts, provide platform for autonomation will make companies more efficient and powerful.

Suggestions

Sr. No.	Particulars	Objectives	Outcome
1	Development of Project Management approach	It is suggested to develop a project management approach to improve the business processes.	It will help to overcome the defects and to improve the production process.
2	Training	It is suggested to impart training to learn the Project Management methods and techniques.	It will help SMEs to improve and develop their overall business processes.
3	Implementation of Low Cost Automation	It is suggested to use the Low Cost Automation tools and techniques.	It will help SMEs to reduce cost and improve quality.
4	Cost reduction techniques	It is suggested to follow following techniques • Plan, Do, Check, Act • Plan, Do, Study, Act • Look, Think, Relate, Act	It will help SMEs to reduce the cost and unnecessary wastage of resources.

CONCLUSION

Overall the project was great tool to enhance my knowledge about project management and its linkage with Industry 4.0. Following are the conclusions of this project.

- There is positive correlation between Project management and Industry 4.O.
- There is no awareness about Industry 4.O among SMEs.
- There are many challenges for SMEs to adapt Industry 4.O such as
- Need for working capital management
- Unavailability of proper performance measurement tools
- OEMs pressing tier 1, tier 2 and tier 3 suppliers
- Market Instability
- Project by Project Methodology will help the SMEs for cost cutting, cost saving and cost control.
- SMEs need help & Guidance to adapt Industry 4.0

REFERENCES

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2	www.pmipunechapter.org
3	www.forbes.com
4	https://www.i-scoop.eu/industry-4-0/