

Investigation of IoT Awareness amongst the Top Level Management Personnel, In Manufacturing Industry

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Abstract: Bhubaneswar has been a major manufacturing hub, especially for automobile sector, in India. It has also become a leading IT hub of the country. The researchers conducted a survey, to understand the awareness of top management personnel of this manufacturing sector, about their awareness in accepting the adoption of IoT (Internet of Things). It was published by a 2019 PWC Annual Manufacturing Report that many manufacturers consider themselves to be too small to invest in IoT. The outcome of this research is very encouraging. The results presented in this paper is an outcome of one to one interview with top management personnel of leading manufacturers, about almost all the parameters of IoT adoption.

Index Terms - IoT, Internet Of Things , Manufacturing Industry, Industry 4.0 , Bhubaneswar

I. INTRODUCTION

New inventions and new technology are big contributors for businesses to grow and develop during the Industrial development. Internet of Things is a technology, advancing at warp speed, and most manufacturers struggle to keep up. The term “Internet of Things (IoT)” was coined by Kevin Ashton in 1999 during his work at Proctor and Gamble. It is defined as objects/devices that are able to connect to and transfer data via the internet. In other words, IoT is defined as one object communicating to another object over internet connectivity. In the phrase IoT, ‘Thing’ refers to these connected objects that send data to and receive data from other objects.

There are various domains where IoT can provide multiple benefits. Manufacturing is yet another sector that is seeing benefits by adopting IoT technologies. In fact, global manufacturing is being transformed due to IoT based technologies. India is still in very early stages of adopting digital and IoT technologies. With global competition, Indian manufacturers cannot afford to be left out of this fourth industrial revolution and if India aims at becoming a global manufacturing hub, it must proactively embrace these technologies to achieve it. Considering this, the awareness about the technology in companies is very important

II. LITERATURE REVIEW

Venecia Liu in a Gartner report mentioned that the effective use and implementation of IoT will be beneficial for the all type of manufacturing companies. He found that IoT will have a great impact on the economy by transforming many enterprises into digital businesses and facilitating new business models, improving efficiency and increasing employee and customer engagement

Mark Hung[2017] in Gartner’s Insights expressed that Technology provider plays important role in this scenario. For them to successfully sell IoT, it is imperative to focus on the business value

According to The Economist, cost for computing, cost of sensors, operational costs have dropped down compared to earlier years. Therefore the technology has become more accessible and affordable; however the perception of financial barriers to IoT still persists.

Interestingly, the PwC report also suggests that many large scale manufacturers are already using technologies like ERP systems and CNC robotics. Additionally, some businesses in the UK may actually be deploying smart technologies without even realizing it.

Based on this, it's possible that there is lack of awareness about prerequisites for IoT implementation and IoT benefits.

Considering these parameters, knowing the awareness level amongst Bhubaneswar Manufacturing top management people is very important.

This would help in deciding strategies for technology providers and increasing the usage of this technology for competitive benefits.

III. RESEARCH METHODOLOGY

With the feedback and suggestions received during a pilot survey, it was realized that small and medium companies (MNCs) are neither inclined to, nor could afford to, adopt IoT. Hence after the pilot survey the questionnaire was finalized and data was collected from Multi National and large scale companies. It is the result of a questionnaire based data collected from 51 companies. Thus all high-ranking manufacturing companies in Bhubaneswar region are covered in this survey. The most important point in this survey is that for all 51 companies the data was collected based on one-on-one interview which was conducted in person. It helped in eliminating non-response rates.

IV. ANALYSIS AND INTERPRETATION

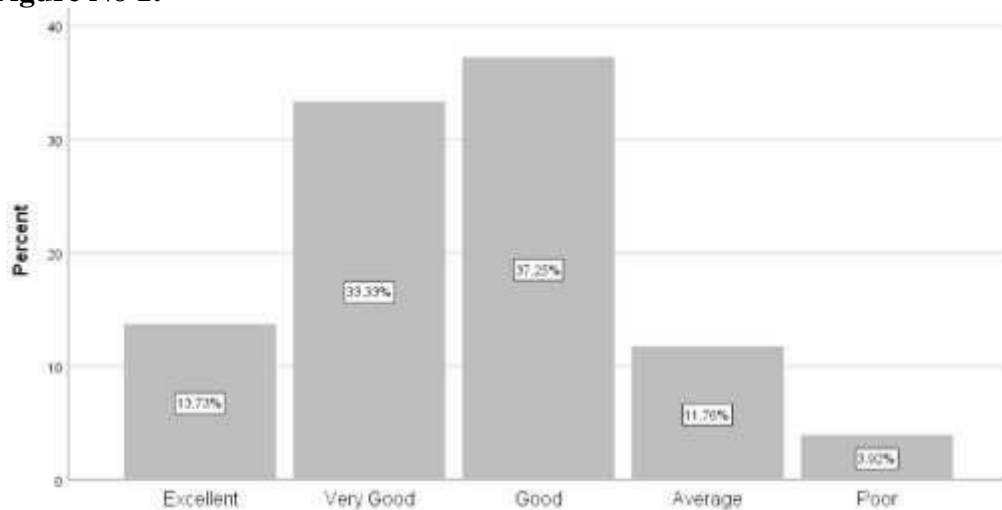
Based on the survey and questionnaire specifically focus on checking the awareness about IoT, below is the analysis.

1. To start with, the direct question was asked to the respondents to check their own understanding about IoT,

Question: What is your awareness level about IoT?

Table No 1:

	Frequency	Percent	Cumulative Percent	Mean	Median	Std. Deviation
Excellent	7	13.7	13.7	2.59	3.00	1.004
Very Good	17	33.3	47.1			
Good	19	37.3	84.3			
Average	6	11.8	96.1			
Poor	2	3.9	100.0			

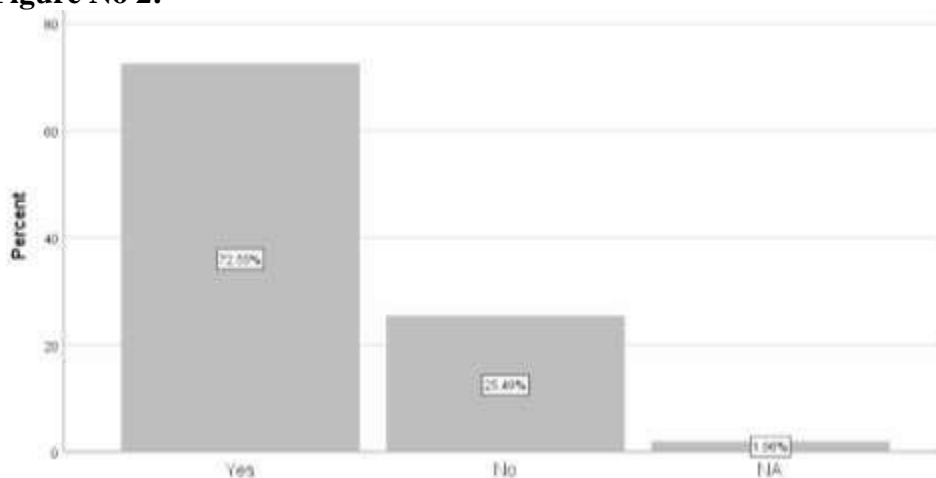
Figure No 1:**Findings:**

With reference to the above figure, 13% of respondents are excellent as awareness about IoT is concern. That means, majority respondents think that they have a good awareness level about IoT.

- To know more about the awareness amongst the respondents, researcher checked if they have attended any Conference /seminar on IoT. Researcher received below response on this question.

Table No 2:

	Frequency	Percent	Cumulative Percent	Mean	Median	Std. Deviation
Yes	37	72.5	72.5	1.29	1.00	0.502
No	13	25.5	98.0			
NA	1	2.0	100.0			

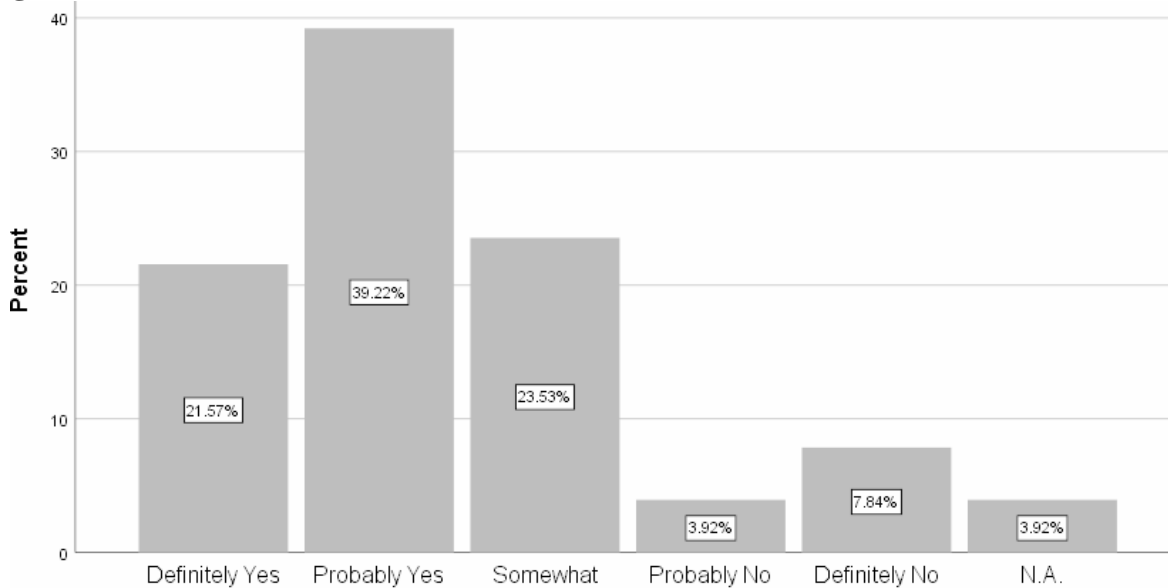
Figure No 2:**Findings:**

72.55% respondents have attended conference/Seminar held on IoT.

- Further researcher also checked the status of IoT Training or workshop attended by key people of the company

Table No 3:

	Frequency	Percent	Cumulative Percent	Mean	Median	Std. Deviation
Definitely Yes	11	21.6	21.6	2.49	2.00	1.317
Probably Yes	20	39.2	60.8			
Somewhat	12	23.5	84.3			
Probably No	2	3.9	88.2			
Definitely No	4	7.8	96.1			
N.A.	2	3.9	100.0			

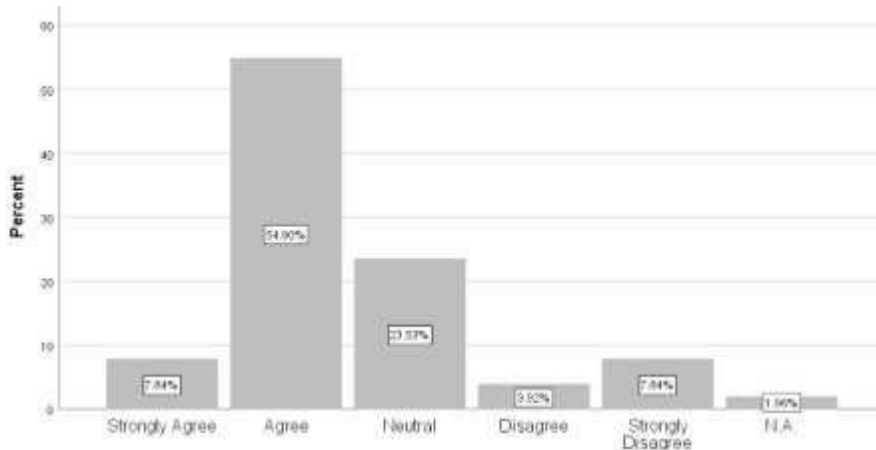
Figure No 3:**Findings:**

Amongst the population, 60.79% have attended workshop or training. 23.53% have attended at least some part of it. Hardly 10% of respondents are saying that they have not attended any workshop or training.

4. Going one step ahead, researcher checked if there is enough awareness about the current state of IoT in their Company

Table No 4:

	Frequency	Percent	Cumulative Percent	Mean	Median	Std. Deviation
Strongly Agree	4	7.8	7.8	2.55	2.00	1.101
Agree	28	54.9	62.7			
Neutral	12	23.5	86.3			
Disagree	2	3.9	90.2			
Strongly Disagree	4	7.8	98.0			
N.A.	1	2.0	100.0			

Figure No 4:**Findings:**

62.74% of respondents agreed that there is enough awareness about IoT in their company; however 23.53% respondents are not sure about the current awareness state of IoT in their company.

5. Additionally below questions were asked to check further awareness about IoT in Top level management personal: (Values in %)

No.	Questions	Yes (%)	No (%)	May be (%)
5.1	Are you aware of various applications where IoT is used?	70	5	25
5.2	Are you aware of IoT implementation advantages?	65	3	32
5.3	Are you aware of the Challenge faced in IoT implementation? (pre-implementation, during implementation, post implementation)	60	10	30
5.4	Do you know how IoT can be implemented in your company context?	51	21	28

V. CONCLUSION AND RECOMMENDATION

We live in an era where smart things from being a luxury have now turned into a necessity for everyone. The impact of the fourth industrial revolution and IoT on the economy is expected to be huge but it can only be truly advantageous when it is coupled with an acute awareness and identification of suitable IoT, on case to case basis.

IoT plays a significant role in manufacturing processes. Looking at overall data and its analysis, it is observed that, due to various conferences, news, seminars, training imparted across industry, management is aware about IoT, its application and advantages.

They find IoT beneficial and want to use it for them. However while discussing about their awareness regarding challenges, for some reasons, like information about the exact approach or starting point, they are hesitating to implement it.

Many are struggling to understand an appropriate model to adopt for implementation of IoT, in their companies.

We can conclude that, as IoT becomes more clearly understood within the engineering and manufacturing sectors, the barriers to IoT infrastructure rollout will be lessened. IoT is a multi-faceted strategy. If an existing employee base has skills gaps, outsourcing IoT development will allow manufacturers to have more capacity and specialist skills on hand for a fraction of the cost of recruitment. It is worth considering seeking additional input to support in areas where internal resources are not sufficient.

Building awareness by communicating the importance of IoT initiatives and programs to industrial growth will help. At the same time by sharing success stories and lessons from technology and innovation, IoT adoption journey will be smoother. It will help companies in multifold growth. It is also likely they'll get to market faster – a vital benefit in highly competitive global markets.

VI. REFERENCES

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