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Subject: Publication of paper at International Journal of Research and Analytical Reviews (IJRAR).

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WOMEN IN CORPORATE MANAGEMENT: SOME ISSUES

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***Abstract*:** This paper is related to issues related to corporate women. It is high time that society wakes up to recognize the indomitable spirit of the women, who have reached the top of the corporate ladder, taking all the hurdles in their stride. Any organization that ignores the potential of women today will have made a fatal mistake. Successful executive women authentically lead big, bold change, pushing the envelope of institutional norms with power and credibility. They not only shape the culture but broaden the strength and capability of the organization itself by creating a diversity of leadership. Women today have emerged as a highly effective workforce. To ensure that more women transition to senior leadership positions, organizations need to have gender-friendly HR practices. Companies should leverage their potential to strengthen their competitive dynamics. Women's employment and appraisal in the organization should be based on merit rather than gender disparity. Access of women to leadership development experiences and training programmes should be enhanced. Organizations need to look at creating forums that can provide an opportunity for women employees to come and express their concerns. challenges and find solutions. If unleashing the untapped leadership potential of talented women and harnessing it for organizational good becomes their shared agenda, supportive top management and committed HR can do wonders together.

IndexTerms: Corporate Womens, Corporate ladder, HR practices, Women employment.

I.INRODUCTION

As a concept 'authority' has been the most widely debated, articulated, and written about in the field of management and it continues to attract the attention of thinkers all over the world. Arguably, the most effective form of leadership is by setting the right personals examples; though it owes its origin to the armed forces, it holds good even for corporate battlefields. For many of us, leadership begins at home as we tend to learn a lot from our parents and this is confirmed by a study by the Harvard Business Review (HBR). There is a never-ending debate on whether leadership is different from management. While some (John Kotter and Peter Drucker and the US Govt., Website) say that leadership and management are two distinctive and complementary systems of action with each one having its functions and activities. One common agenda for both functions is the achievement of goals and results, for which a leader influences a group, while a manager may use his authority. The quality of output indicates the efficacy of the method used. Several corporate Indian women achieved leadership positions and have done us proud both at have and across the seas. But despite all this, women employees and workers continue to be haunted by problems like dissemination, sexual harassment, indifference, and insensitivity. Notwithstanding all this, we salute that 'women employee' who carries the baby in her womb and project the deadline in her mind with equal ease and aplomb.

II.WOMEN AND MANAGEMENT

Despite a 50 year history of women in the corporate world, there are still only a very few women that occupy the coveted top roles because of performance management systems, based on meritocracy rather than any other preferential performance systems. Women of the 18th century have been described as the ones suffering from a conflict within the conflict between secret visions and unwelcome realities, between personal desires and family restrictions, between consolatory dreams and hostile circumstances. At times, the result of this conflict is victory or defeat, but for the 21st-century women, the outcome is the only victory. Today's women are more assertive, much more determined, and even more tactful in handling crises both managerial and personal. They dare to dream big, they build castles in the air, but they also build strong foundations beneath. Earlier, management styles were characterized by brute force and aggressiveness, essentially male attributes, these days; organizations are looking more for empathy, understanding, and communication skills, attributes that are more feminine. Gone are the days when women were identified with secretarial roles. Women are now increasingly sought as professional managers, who have the necessary skills and qualities that are required for an organization to succeed. Women tend to choose a 'career tree' rather than a `career ladder' (working women – US magazine) — Job satisfaction survey conducted in October 1986). Labyrinth another metaphor associated with women's leadership (Eaglyl & Carli, 2007). When Hennig & Jardim's study (1977) revealed that successful career women have in common a few characteristics:

l) Having some idea of future career goals
2) Hard work,
3) Determination,
4) Perseverance.
5) Commitment to their careers,
6) Achieving position and status despite many barriers

It seemed that women who wanted to be at the top had finally found a clear compass. But three decades later the need to clarify the compass to persist. The haze and mist around the compass due to the complexity in career opportunities for women seem even more.

III. ISSUES OF CONCERN

Indian women have adopted so many roles in their own lives before entering the portals of the corporate world that the style flexibility which is the essence of leadership today is almost ingrained in their psyche. The status of women managers in Indian organizations, several relevant issues need to be considered in formulating and implementing appropriate strategies for making workplaces better for women managers in near future. There is no doubt that the so-called "glass ceiling" (different kinds of barriers to prevent women from reaching the top or executive positions) is a reality, and it becomes pertinent to know the magnitude of this problem in India. Women may adopt different leadership styles than men. In general, women are more relationship-oriented and usually pay more attention to the processes of the tasks while focusing on results and outcomes. It is to be noted that women exhibit or prefer 'interactive' leadership style and men exhibit or prefer 'command and control' leadership style. A study on the changing role of women in business and Government in more than 70 countries indicated that female managers have made more progress in the US than in any other country, though it had only 5.1% of executive management positions in the 500 largest US companies in 1999, compared to 2.4% in 1996. In a country like Australia, the percentage of executive management positions held by women is as low as 1.3%, 4.7% in France, 3% in Brazil, 3.6% in the U.K., and 3% in Germany. There were only 4 women CEOs in fortune 500 and 8 women CEOs in fortune 1000. The dominance of male values was identified as the biggest obstacle to recruiting and promoting women in management positions and family obligation was the second biggest. By the year 1999, 38% of all the firms in the US were run by women. There are growing awareness and mounting evidence that gender equality boosts enterprise productivity spurs economic growth, and improves the welfare of families3. A study by Khoshals and Gupta4 has found that women make up 31% of the official labor force in developing countries and 46.7% worldwide. A study also reveals that rural women generally produce more than 55% of all the food grown in developing countries. Many experts believe that women have in them the unique "Interactive Management Skill" that needs to be utilized fully in the organizations of the future, to further compete in the 21st century. The "glass ceiling" has kept away women from advancing higher. There is a wide disparity in the employment of women managers both in developed and developing countries.

Table 1. How Women Fare in Industrialized Countries *Source: kip: lit witisnidhanbad. ic.in*

Country	Women as a percentage				
	All Workers	Managerial Workers	General Civil Sen-ice	Managerial Civil Sen-ice	National Parliament/ Congress
Japan	41.00	8.90	20.20	1.40	7.30
USA	46.60	46.00	49.30	23.10	14.30
Sweden	48.00	35.50	43.00	51.0(1	45.30
Germany	44.00	26.90	39.00	9.50	32.20
Britain	44.90	30.00	49.10	17.20	17.90

This table indicates how women fare in industrialized nations. In recent years, women managers and entrepreneurs have been found in several fields and some of them have achieved distinguished positions in their respective areas in India. According to Forbes Magazine5 (among 100 powerful women) Survey, today what do Indra Nooyi (Pepsi Co., CEO, stood 6th position), Chanda Kochhar (ICICI Bank, CEO, 92nd) and Shikha Sarma (CEO, Axis Bank, 89th) have in common? They are all women leaders and are role models who have

broken through the proverbial, yet a very real glass ceiling in the corporate world to reach the top. However, it would be premature to celebrate the end of male domination in our society in general, and in the corporate world, in particular. Survey after survey has shown that despite increased participation of women in the organized sector, they still represent only around a third of the workforce. Unfortunately, the representation of women on corporate boards6 in India is very low. Out of the 1,112 board of directors of companies represented on the BSE-100 index (from CMIE database). a meager of 59 are women representing (5.3%) and 94.7% are men. But Indian women have a long way to go compared to women in the developed countries like Canada (15%), the US (14.5%), U.K. (12.2%), Hong Kong (8.9%), and Australia (8.3%). This may change in the future with many women joining the Indian workforce and moving up the ladder. Many organizations are trying to build a culture that will succeed with diverse people putting their minds together at work.

IV. CONCLUSIONS AND SUGGESTIONS

It is high time that society wakes up to recognize the indomitable spirit of the women, who have reached the top of the corporate ladder, taking all the hurdles in their stride. Any organization that ignores the potential of women today will have made a fatal mistake. Successful executive women authentically lead big, bold change, pushing the envelope of institutional norms with power and credibility. They not only shape the culture but broaden the strength and capability of the organization itself by creating a diversity of leadership. Women today have emerged as a highly effective workforce. To ensure that more women transition to senior leadership positions, organizations need to have gender-friendly HR practices. Companies should leverage their potential to strengthen their competitive dynamics. Women's employment and appraisal in the organization should be based on merit rather than gender disparity. Access of women to leadership development experiences and training programmes should be enhanced. Organizations need to look at creating forums that can provide an opportunity for women employees to come and express their concerns. challenges and find solutions. If unleashing the untapped leadership potential of talented women and harnessing it for organizational good becomes their shared agenda, supportive top management and committed HR can do wonders together.

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R.B.Joshi

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COMPANY BRAND RECOGNITION-A VISCERAL STUDY

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***Abstract*:** This paper is related to brand recognition. The study was conducted to find the employee's expectations (factors) to consider the company as a branded one and it also been compared with the prevailing scenario. The results show, there is the optimum correlation of many factors (i.e. expected EB factors and the existing scenario) which is a positive sign of effective Employer branding implications. This proves that the company is on the right path, which helps to gain potential employees and retaining them to rejuvenate the energy brand of the Company.

IndexTerms: Brand Recognition, EB factors, Company.

I.INTRODUCTION

The term 'employer brand' was first publicly introduced to a management audience in 1990, and defined by Simon Barrow, chairman of People in Business, and Tim Ambler, Senior Fellow of London Business School, in the Journal of Brand Management in December 1996. The term employer brand was first used to denote an organization's reputation as an employer. Since then, it has become widely adopted by the global management community. Minchington (2005) defines employer brand as "the image of an organization as a 'great place to work' in the mind of current employees and key stakeholders in the external market". The art and science of employer branding are therefore concerned with the attraction, engagement, and retention of initiatives targeted at enhancing the company's employer brand. "India, Inc."- a common term used in India to refer to India's corporate sector which aims to positively build on opportunities as the world economy strengthens, and the employer brand is a prime example of a progressive HR practice in India. An employer brand encompasses the values from the past, philosophies in the present context, and the vision for the future, with respect Employer Brand Image...to its people. Hence, this process creates an image of the organization based on what it stands for as an employer. A powerful employer brand can attract and retain talent and represent quality to its customers, to gain global recognition sustainably. The employer brand strongly supports corporate brands and vice versa. Employer brand: Effective way for talent acquisition High-performance companies understand that the key to attracting and retaining talent is to be recognized as a top-tier employer that can meet the needs of high-potential and high-performance employees. By living a strong employment brand and communicating that brand through effective marketing practices, employers get the edge they need to attract the best talent and keep them. Branding Methods Branding can be done in two ways such as external branding and internal branding. External branding refers to branding which is done by using external sources and which may (or may not) require some investment in monetary or other forms. The different means of doing external branding are Use of Jobsites, Banners, Road Shows, Corporate Social Responsibility, Public Events Newspapers, Email, Tagline, Align with celebrities. Employer Branding Process Companies before startup with their employer branding should create an employer branding model. The process model will help to identify the key processes that will work for any organization. The employer branding process is a five-step process.

II. REVIEW OF LITERATURE

Keller (1993) suggests that "Brand equity elevated the importance of brand in marketing communication strategy and is often used to persuade customers to buy a product or service. However, in recent years, especially in today's competitive market, employer branding is used to recruit and retain good employees from a diverse workforce. Most companies tend to promote factors that make their firm a good place to work and also offer bright and cheerful office space, an ethos of collaboration and teamwork, flexible hours, crèche facilities, or even an excellent canteen.

Kapfferer (1997) introduced the concept of the brand pyramid, consisting of three tiers. Its fundamental or genetic code is the brand core, which remains fixed over time. The middle tier of the pyramid is the brand style, which articulates the brand core in terms of the culture it conveys, its personality, and its image or self-projection. The base layer of the pyramid comprises the brand themes, which are how the brand is currently communicated through its advertising. The top tier of the pyramid is the brand core.

Dell & al (2001) stated being an "Employer of choice" entails more than success in recruiting and retention. Employees should choose not only to join the company and stay with it but also to identify with its vision and values and give its loyalty, commitment, and performance, whatever the trend of the job market. Research has also demonstrated the causal relationship between high levels of engagement and enhanced business performance.

Fabian Hieronimus (2005) analyzed that "Few companies are as rigorous or precise at branding themselves as employers as they are at branding their products and services. Experience, therefore, suggests to us that many of these initiatives could fail. For a company to exploit its brand effectively when it fishes for talent, it must think of recruits as customers, use sophisticated marketing analysis to identify its key rivals, determine which corporate attributes matter most to specific types of recruits, and understand how best to reach them.

Michael Palmer (2007) suggests that acquiring and retaining top talent requires a strong employer brand. By living a strong employment brand and communicating that brand through effective marketing practices, employers get the edge they need to attract the best talent and keep them and also there are some key areas you can focus on when creating, living, and enhancing your employer brand, they are: Find a way to touch every candidate, Avoid the "black hole" of recruiting, Leverage your talent pool, Train hiring managers to be effective interviewers, Build and use consistent employer messaging internally and externally.

John Sullivan (2008) suggests an *only a* long-term recruiting strategy is designed to bring in a steady flow of high-quality applicants over many years. Employment branding stands alone as the only approach corporate recruiting managers can leverage to guarantee an end to their talent shortage problem. Unfortunately, most corporate recruiting managers spend less than 5% of their budgets on this powerful long-term solution. In direct contrast, firms that have taken the time to invest in building a great employment brand like Google and Southwest Airlines have not only dominated their industries, but they have also turned the common talent shortage problem into a more desirable talent "sorting" problem.

Annelize Botha (2009) suggests that employer brand is influenced by target group needs, a differentiated Employer Value Proposition (EVP), the people strategy, brand consistency, communication of the employer brand, and measurement of Human Resources (HR) employer branding efforts.

Lara Moroko (2009) suggests that "Branding is not just talking about product and services. But also it is companies have begun branding themselves as employers, too, betting that if they can convey to the world why their workplace is appealing and unique, they will have an easier time attracting good workers. The key is to align the brand with the company's business plan, meaning the brand is designed to attract and retain the kinds of workers the company needs most -- those who can help it increase sales, profits, and market share. And the key to doing that is to borrow a tool from the product-marketing toolbox.

Brett Minchington (2012) suggests that "Employer needs 12 key areas for companies to focus on in 2012 when developing or evolving their employer brand strategy. There are: Consider the bigger picture, Involve marketers in your employer brand strategy, Learn how to use the pockets of talent excellence in the global labor pool, invest in the strategic thinking capabilities of emerging leaders, support accelerated skill and capability development, focus on systems integration across borders, integrate formal and informal learning and enable mobile access, focus on the experience and engagement will follow, use technology to enable employees to work "smarter", Encourage employees to grow their global network and online profile, Don't be obsessed with metrics, identify and release your brand ambassadors.

III. RESEARCH PLAN

A survey instrument consisting of a detailed questionnaire was prepared based on the literature reviews. The term Employer brand in this study denotes the image of the employer as perceived by the internal employees (which generally is denoted by researchers as Internal Employee Image) and covers the opinion on the employer brand components namely compensation and benefits, work environment, product/company brand strength, work-life balance and company culture & environment. Employer brand variable Conceptualized based on The Corporate Leadership Council dimensions were operationalized by using a set of 5-point Likert Scale statements

Data source: Primary Data & Secondary Data.

Research Instrument: Questionnaire

Method of contact: Personal

Sample size: 100 respondents

The study is conducted in an automobile industry at Coimbatore, where the total numbers of employees are 325, from which the researcher has adopted a simple random sampling technique to select 100 respondents.

3.1 Research

The process of research helps an employer to understand where the company is positioned in the employment market and to resolve an appropriate action plan. The four key factors, both internally and externally, are:

- To know how the target group perceives the employer
- To learn what the target group expects from the employ
- To discover where the employer is positioned in the market concerning his competitors
- To ensure that the research is updated regularly

3.2 Employer Value Proposition (EVP)

Every business and organization needs an exceptional employer offer. The EVP gives existing and prospective employees a reason to work for an employer and reflects the company's competitive advantage. Employers who deal with the EVP effectively benefit from a raise in their talent pool and employee commitment, as well as a potential decrease in salary costs. Normally, less attractive employers need to pay more to get top talent whereas attractive employers do not. By analyzing the factors influencing the employer brand, and by defining a strong and true EVP, the employer will be able to deliver sound and consistent communications during the communication phase and develop an attractive, as well as unique, employer brand.

3.3 Communication Strategy

The development of a communication strategy is always based on research findings and a well-defined EVP. The EVP is a useful tool used by HR, Marketing, or Communications to be able to emphasize the most attractive factors and be consistent in employer communications. Once an employer knows what to communicate and whom to communicate with, the employer then has to choose the most efficient and effective channels for reaching them. Choosing the right channels and understanding how best to target various groups is also based on research.

3.4 Communication Solutions

This step aims to express the employer value proposition (EVP) by using the right words and images, so it becomes consistent with the corporate identity and branding efforts. The communication material should have the same look and feel irrespective of the communication channel. Since organizations use many different channels, the target groups must recognize the organization and relate to the employer's offer, no matter if they are being reached via the corporate website, reading an advertisement in the newspaper, or taking part in an event. Employers should strive to develop consistency throughout their communication material.

3.5 Action

Implementing all the steps and monitoring closely what works and needs to be adjusted along the way is the final stage. It is of great importance at this point that the organization sets a target on what they want to achieve with the planned activities clearly and measurably. Employer branding in a nutshell is match-making, creating the perfect relationship between the employer and the employee. Securing a talent pipeline and ensuring that companies have the right people on board is probably the most important task of any employer. Understanding what professionals want will help to attract and retain them, if not it is probably time to find out.

3.6 Objective of the Study

- To analyze the various factors influencing Employer Branding.
- To rank the Employer Branding factors prevailing in the research area. (automobile company)
- To measure the expectations and the existing scenario of Employer branding activities in the research area. (automobile company)

3.7 Tools and Techniques used for Analysis

The data collected through the questionnaire has been tabulated and analyzed by using Simple Percentage Analysis, Charts, and Weighted Average Method, etc.

3.8 Research Findings

- It shows that 66% of the respondents are male and only 34% are female
- It shows that 9% of the respondents belong to 20-25 years of age, 55% belong to 25-30, 27% of respondents belong to 30-35, 8% belong to the age group of 35-40 and 1% belong to the age of above 40 years.
- It specifies that 58% of respondents are married and 42% of them are not married.
- It shows that 39% of the respondent belong to 5-10 years of experience, 53% belongs to 2-5 years of experience, 4% have experienced above 10 years and only 4% have 1 year of experience.
- It specifies that 47% of respondents work with their current employer for less than 1 year, 38% working for 2 to 5 years, 13% are working for 5 to 10 years, only 2% worked with their current employer for above 10 years.
- It specifies that 27% joined the current employer for challenging role, 25% for attractive pay, 4% for dream company, 7% for friends, 14% for the onsite opportunity, 20% as it's a branded company and only 3% joined as that was the only offer they got.
- 53% of respondents are happy with their employer, 33% are extremely happy with their employer, 12% are neutral and only 2% are not happy with their employer.

Table 1: Expectations of respondents from the branded company-Factors influencing effective Employer Branding

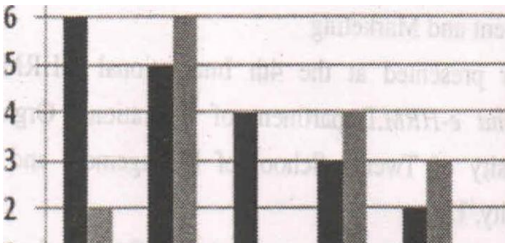
S.No	Opinion	SE	ME	NE	Total Respondents	Value	W.A*
I	Company reputation	58	34	8	100	250	41.67
2	Strong leadership	51	25	24	100	227	37.83
3	Should be an MNC	36	48	16	100	220	36.67
4	Growth in same	44	35	21	100	223	37.17
5	Recruiting through Employee referrals	41	36	23	100	218	36.33
6	Focus on skill and competence	34	44	22	100	212	35.33
7	Next level ofjob	37	45	18	100	219	36.50
8	Worklife balance	41	32	27	100	214	35.67
9	Self development	35	43	22	100	213	35.50
10	Competitive and attractive salary structure	38	37	5	100	213	35.50
11	Strong company culture	46	30	24	100	222	37.00
12	Defined FIR policies	37	47	16	100	221	36.83
13	Good ethical and moral values	32	40	28	100	204	34.00
14	Reference for future employment	32	47	21	100	211	35.17

The above table shows the expectations of the respondents to bring the company as an Employer branded one. The factors like Company reputation, culture, strong leadership, career growth carry more advantage to build the company as a branded one.

Table 2: Ranking of Employer branding factors at the research Area

Employer branding Factors	Mean	Ranking
Good company reputation	3.74	1
Strong leadership	6.56	12
Career growth	4.60	6
Self-development	5.60	8
Training and development	6.46	11
Work-life balance	6.04	10
Competitive compensation	5.89	9
Bigger challenges	7.19	14
Possibilities for promotion	4.55	4
Job security	4.38	3
Attractive salary package	3.52	2
Flexible work timing	4.58	5
Bigger team to work with	7.26	15
Job security	5.50	7
Sponsor for higher education	8.56	17
Well defined policies	8.01	16
Recognition for work	6.64	13

The above ranking system depicts that the company has a good reputation, which plays a vital role in effective employer branding. In the first 5 ranks, placed factors are important for pay, job security, promotion, and flexible-work timings, which are the major influencing factors of effective employer branding. It would be added value if the management focuses on work-life balance, career growth too.



■ Expectations of the Employees

- Existing scenario

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IV. CONCLUSION

The study was conducted to find the employee's expectations (factors) to consider the company as a branded one and it also been compared with the prevailing scenario. The results show, there is the optimum correlation of many factors (i.e. expected EB factors and the existing scenario) which is a positive sign of effective Employer branding implications. This proves that the company is on the right path, which helps to gain potential employees and retaining them to rejuvenate the energy brand of the Company.

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Dr. Sheetal Chandrakant Gade
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Subject: Publication of paper at International Journal of Research and Analytical Reviews (IJRAR).

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TRAINING AND DEVELOPMENT EFFECTIVENESS FOR GAINING COMPETITIVE BUSINESS ADVANTAGE

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***Abstract*:** This paper is related to issues related to training and development effectiveness for gaining a competitive business advantage. A sustainable competitive advantage allows for the maintenance and improvement of your company's competitive position in the market. It is an advantage that enables your business to survive against its competition over a long period. The advantage comes from your company's unique skills and resources working together to implement strategies that competitors cannot implement as effectively. Keep in mind that most advantages can be duplicated within a period. Approximately 70 percent of all new products can be duplicated within one year and 60 to 90 percent of process improvements eventually spread to your competitors. Competitive advantage is a dynamic process that demands constant attention. It is NOT a once and done flavor of the month!

Training and development enhance their HR capabilities and strengthens their competitive edges. At the same time, the employee's personal and career goals are furthered, generally adding to his or her abilities and value to the employer. Ultimately, the objectives of the HR department are also furthered.

IndexTerms: Development Effectiveness, Business Advantage, Dynamic Process, Training, and Development.

I. INTRODUCTION

In the pursuit of achieving Sustainable Competitive Advantages, organizations are striving to put the philosophical perspectives of Destination Quality into manifested realism. The strategy must be followed by the requisite structure incorporating Training and development aspects in the application of the best of scientific tools. This is where most of the companies try to do their best. But the big question remains "How good is the best?" The present study has been undertaken to evaluate the performance of selected employees about the assimilation of training and a development element in their core system endeavored to achieve a Competitive Advantages and concludes with the fact that the employees significantly differ in their institutionalization of training and development aspects as reflected through the wide gap that exists among this SOWT analysis and performance-based training.

Competitive advantage comes from what your people do (performance), not from what they know. How well does your company build and maintain a competitive edge? Five challenges most organizations face in gaining competitive advantage include:

- Recognizing and taking advantage of market opportunities
- Defining product and/or services that create value for customers
- Attracting, retaining, and improving the best available resources for providing product and services
- Managing uncertainties in creating and realizing product and service opportunities
- Sharing the resulting benefits with your resources (employees and suppliers)

Attracting, retaining, and improving the best available resources is perhaps the most difficult and often overlooked of these challenges. Performance-based training is one way to meet this challenge. Performance-based training emphasizes proficiency in job tasks essential to your competitive advantage. It is based on a clear definition of the tasks, skills, and knowledge needed to competently perform each job in your organization. A performance-based training program is a planned, organized sequence of activities designed to prepare persons to competently perform their job performance at the highest levels possible, or improve to meet the need. Training and Performance Improvement departments must be able to guarantee that every learner can demonstrate full competence in every skill taught. How do you know if the training you are providing is performance-based? True performance-based training applies scientific principles on how people, learn, think, and remember. It requires the application of an instructional system design model that provides for

- Needs assessment
- Curriculum development
- Course design and pilot delivery
- Evaluation

II.TRAINING AND DEVELOPMENT AS SOURCE OF COMPETETIVE ADVANTAGE

Companies derive a competitive advantage from training and development. Training and development programs, as was pointed out earlier, help remove performance deficiencies in employees. This is particularly true when—(i) the deficiency is caused by a lack of ability rather than a lack of motivation to perform, (ii) individual(s) involved have the aptitude and motivation to learn to do the job better, and (iii) supervisors and peers are supportive of the desired behaviors.

There is greater stability, flexibility, and capacity for growth in an organization. Training contributes to employee stability in at least two ways. Employees become efficient after undergoing training. Efficient employees contribute to the growth of the firm. Growth renders stability to the workforce. Further, trained employees tend to stay with the company. They seldom leave the company. Training makes the employees versatile in operations. All-rounders can be transferred to any job. Flexibility is therefore ensured. Growth indicates prosperity, which is reflected in increased profits from year to year. Who else but well-trained employees can contribute to the prosperity of an enterprise?

In the knowledge economy, it's no longer enough to put your employees through the occasional training module a few times a year. Companies looking to operate and compete in a global market need to constantly skill and re-skill their people, and training is becoming a 24/7/365 affair, cutting across geographies and time restrictions. To deliver this training on this scale and frequency, technology is key-media-rich content, video-on-demand, chat, and online self- tutorials have ensured that most of the learning for employees takes place at the place, and time, of their convenience.

Nowhere does training assume greater importance than in the BPO industry. With thousands of fresh graduates handling customer queries, there's an opening need to equip them with the necessary soft and specialized skills. Periodic and, often, frequent changes in the global business environment, have put greater pressure on training departments to bring employees up to date on the latest rules and regulations in their clients' industries.

Besides, with BPO companies looking to move up the value chain. People need to be coached in new skills. 'Traditional training was just about behavioral and technical training.'

Now, it includes cultural and value training, understanding one's own as well as clients' organization, and the industry in which one is working. There is also a need to get people ready for potential jobs that one may want them to take up.

Accidents, scrap, and damage to machinery and equipment can be avoided or minimized through training. Even dissatisfaction, complaints, absenteeism, and turnover can be reduced if employees are trained well.

Future needs of employees will be met through training and development programs. Firms take fresh diploma holders or graduates as apprentices or management trainees. They are absorbed after course completion. Training serves as an effective source of recruitment. Training is an investment in HR with a promise of better returns in the future.

III.NEEDS ASSESSMENT

Needs assessment diagnoses present problems and future challenges to be met through training and development. Organizations spend vast sums of money (usually as a percentage of turnover) on training and development. Before committing such huge resources, organizations would well to assess the training needs of their employees. Needs assessment occurs at two levels: group and individual. An individual needs training when he's on his performance falls short of expectations. Performance deficiency may be due to KSA shortage in skills and abilities is the cause for deficiency, training becomes necessary. Parallel to training other initiatives like job aid, practice, change of job, transfer, or termination may also be tried.

Assessment of training needs must also focus on the anticipated skills of an employee. Technology changes fast and new technology demands new skills. The employee must be trained to acquire new skills. This will help him/her to progress in his or her career path. Training and development are essential to prepare the employee to handle more challenging tasks. Individuals may also require new skills because of possible job transfers. Although job transfers are common as organisational personal demands vary, they do not necessarily require elaborate training efforts. Employees commonly require only an orientation to new facilities and jobs. Recently, however, economic forces have necessitated significant retraining efforts to assure continued employment for many individuals. Jobs have disappeared as technology, foreign competition, and the forces of supply and demand are changing the face of our industry. Assessment of training needs occurs at the group level too. Any change in the organization's strategy necessitates the training of groups of employees. For example, when the organization decides to introduce a new line of products, sales personnel and production workers have to produce, sell, and service the new products. Training can also be used when high scrap or accident rates, low morale, and motivation, or other problems are diagnosed. Although training is not a cure-all, such undesirable happenings reflect a poorly-trained workforce.

How to make training and development effective?

Action on the following lines needs to be initiated to make training practices effective:

Ensure that the management commits itself to allocate major resources and adequate time to training. This is what high-performing organizations do. For example, Xerox Corporation, in the US invests about $ 300 million annually or about 2.5 percent of its revenue on training. Similarly, Hewlett-Packard spends about five percent of its annual revenue to train 87,000 workers. Ensure that training contributes to the competitive strategies of the firm. Different strategies need different

HR skills for implementation. Let training help employees at all levels acquire the needed skills. Ensure that a comprehensive and systematic approach to training exists, and training and retraining are done at all levels on a continuous and ongoing basis. Make learning one of the fundamental values of the company. Let this philosophy percolate down to all employees in the company. Create that there is proper linkage among organizational, operational, and individual training needs. Create a system to evaluate the effectiveness of training. Understand the meaning of Competitive business Advantage.

Competitive Advantage (CA) is a position that a firm occupies in its competitive environment. Michael Porter argues that a competitive advantage-sustainable or not exists when a company's earnings exceed its costs (including the cost of capital) significantly. That means that normal competitive pressures are not able to drive down the firm's earnings to such an extent that they cover all costs and just provide a minimum sufficient additional return to keep the capital invested. It should be noted that most forms of competitive advantage cannot be sustained for any length of time because the competitors would try to duplicate the competitive advantage held by any one firm.

A firm possesses a Sustainable Competitive Advantage (SCA) when it has value-creating processes and positions that cannot be duplicated or imitated by other firms so a competitive advantage (CA) in that it provides a long-term advantage to the organization. But these above-normal financial performances can attract new entrants who may drive it down.

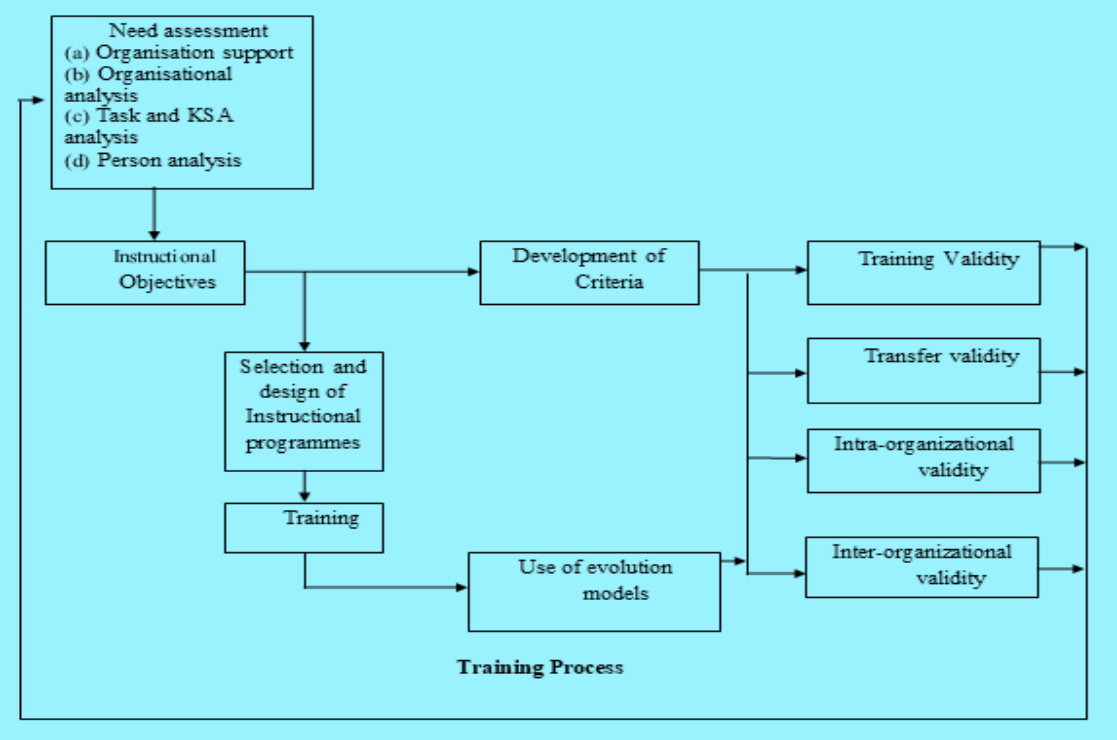

Figure 1. Training Process

IV.To enhance compete successfully and gain Competitive Advantage through SWOT Analysis.

In making use of SWOT Analysis, start with overall strengths and weaknesses, then find the best combination of relative strengths (and the absence of critical weaknesses) to use against specific competitors in specific markets.

When developing a SWOT Analysis, either for yourself or a competitor, consider these points:

- Generally, even in the most complex situation, there should be no more than 3-4 conclusions for each category of a SWOT.
- Both strengths and weaknesses are internal; they are within the direct control of the company
- Both opportunities and threats are usually external; they are outside the direct control of the company
- By definition, a key point for one category cannot be a key point for another category
- Strengths and weaknesses are relative and have limits. No strength or weakness applies to all competitors in all market situations.

Comparing the Competitors' SWOT Analysis to your own SWOT Analysis can help to identify true strengths and opportunities for you and the competition. For example, if your analysis identified the same strength for you and a key competitor, it is possible that it is not a strength for either of you – but is a requirement for competing in this market. Be careful not to define a requirement such as this as a competitive advantage – it is NOT!

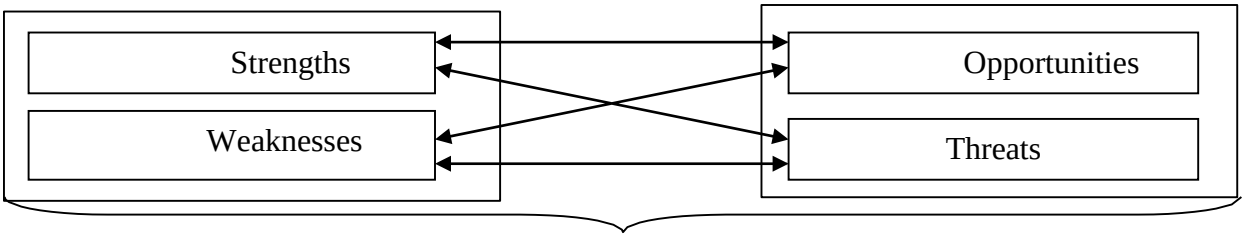

Figure 2. Strategic Choices

V. SWOT Analysis and Evaluating the Quality of a Firm's Theory of how to Compete Successfully and Gain Competitive Advantage

The Importance of Competitive Advantage

Success for any business is tricky in the current economy. For your business to remain viable, it has to weather the storms of competition. You have to be able to beat the ferocious market forces and overcome volatility. In other words, you need a competitive advantage and it must be sustainable and able to endure the test of time. Understanding your competitive advantage is critical to your survival. It is why you are in business. Keep in mind that what you do best is what draws customers to buy your product or service rather than those of your competitor's. Gaining a sustainable competitive advantage is not as simple as just being different. Your competitive advantage is not a list of your strengths. Keep in mind that in today's market, too many companies:

- Have a competitive advantage but don't know what it is
- Know what their competitive advantage is but neglect to tell clients about it
- Don't have a competitive advantage but think they do
- Mistake "strengths" for competitive advantages
- Don't properly focus on their competitive advantages when making strategic and/or operational decisions.

Performance-based training is one way to meet this challenge. Performance-based training emphasizes proficiency in job tasks essential to your competitive advantage. It is based on a clear definition of the tasks, skills, and knowledge needed to competently perform each job in your organization.

A performance-based training program is a planned, organized sequence of activities designed to prepare persons to competently perform their jobs. Competitive advantage requires that every employee maintain their job performance at the highest levels possible, or improve to meet the need.

Training and Performance Improvement departments must be able to guarantee that every learner can demonstrate full competence in every skill taught. How do you know if the training you are providing is performance-based? True performance-based training applies scientific principles on how people, learn, think, and remember. It requires the application of an instructional system design model that provides for:

- Needs assessment
- Curriculum development
- Course design and pilot delivery
- Evaluation

There are four key characteristics of true performance-based training that will help you determine how your organization's training rates, and where you can potentially make improvements.

1. Does the training provide clearly stated performance objectives?
2. Is the training derived directly from the job?
3. Does the training use vocabulary and examples that learners will relate well to?
4. Does the training focus on providing learners with practice and immediate feedback on all the skills required to perform a job to contribute to competitive advantage?

VI. Role of Management

Enhancing human performance requires a team of managers and supervisors that can perform as both a well-organized management team and have an in-depth understanding of people's basic needs and behaviors. Managers must be able to make their business vision a reality by developing employee's abilities in teamwork, problem-solving, and critical thinking. It is not enough to merely have a vision, your managers must be able to apply corresponding actions to make it happen. A vision without corresponding action is merely a dream action without vision is a waste of time vision and corresponding actions will take you to new heights!

The corresponding action is derived from the organization's mission statement. The mission statement will only drive competitive advantage if it is properly designed and cuts across the entire organization (multilevel). Managers must apply critical thinking to all aspects of the organization and build a strong business case for decisions. Effective critical thinking takes into account the sustainable competitive advantages of every process and opportunity. Some examples focus on Training and Development effectiveness for gaining a competitive business advantage.

When Delco-Remy trained its employees in participative management, it succeeded in differentiating itself from all competitors in the eyes of Honda and others. The success of this training and resultant competitive advantage is described by Delco's Keith W. Wander: Honda of America was seeking an American battery manufacturer as a supplier to its auto plant in Marysville, Ohio. Honda wanted a plant that had a participative system of management and a reputation for producing a quality product at a competitive price. After contact from the Delco- Remy Sales Department, two American representatives from Honda visited the Delco-Remy plant in Fitzgerald, Georgia. This visit was followed by a second one with Mr. Hoshita, President of Honda, in the group. During the second visit, plant tours were conducted by Operating Team (hourly employees) members. The tours were followed by Operating Team Schuler and MacMillan: Gaining Competitive Advantage / 249 members explaining to Mr. Hoshita how people were involved in the Fitzgerald business, how Fitzgerald and Honda could be mutual resources to each other because of their participative systems, and why a Delco battery was the best-built battery in the world. Mr. Hoshita returned several months later to ask more questions of the Support Team (salaried employees) and Operating Teams. Shortly afterward, Honda of America announced Delco-Remy, Fitzgerald, as its sole supplier of batteries, based upon its (1) culture; (2) quality; and (3) price, in that order. To date, Honda has had zero returns of batteries and zero complaints on quality or delivery.

Dayton Hudson Corporation is using training and development skills to create future customers.B. Dalton Bookseller Division has earmarked $3 million over four years for a literacy training program-Their, their goals are to recruit volunteer tutors and to tell people without basic skills about the free teaching programs available in their communities. As a part of this, Dalton gives grants to local school districts to hire speakers who will persuade teachers to put more emphasis on teaching reading skills. Texas Instruments is engaged in, a similar program. While the result of both the B. Dalton and TI programs is of immediate benefit to the individuals gaining literacy, the companies broaden their base of potential customers over the -longer run.

McDonald's uses training to ensure its distributors of competitive advantage through cost/efficiency. McDonald's uses its intensive training program at Hamburger University to ensure that its franchisees or distributors run as efficiently as possible. Although training is also done to attain consistent quality, its competitive advantage from training is attained from a cost/efficiency thrust.

VII. CONCLUSION

A sustainable competitive advantage allows for the maintenance and improvement of your company's competitive position in the market. It is an advantage that enables your business to survive against its competition over a long period. The advantage comes from your company's unique skills and resources working together to implement strategies that competitors cannot implement as effectively. Keep in mind that most advantages can be duplicated within a period. Approximately 70 percent of all new products can be duplicated within one year and 60 to 90 percent of process improvements eventually spread to your competitors.

Competitive advantage is a dynamic process that demands constant attention. It is NOT a once and done flavor of the month! Training and development enhance their HR capabilities and strengthens their competitive edges. At the same time, the employee's personal and career goals are furthered, generally adding to his or her abilities and value to the employer. Ultimately, the objectives of the HR department are also furthered.

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The research study on economic resession and probable solutions over it

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***Abstract*-In 2019-20, the whole world is facing issues like pull out stakes, defalcation, share market fluctuations, layoffs, termination from job, cash crunch issues and drastic product sales reduction in various businesses due to COVID 19 pandemic. These dynamics in the Indian business firms have decreased the trust of every person and created a panic situation. Globally the raw material like crude oil supply faced crunch due to changing political situations and financial instability. Further, Small and medium businesses are also impacted largely due to reduced sales demand in the export business. This unstable situation of mismatch in demand and supply and its further effects is typically called a recession.**

To understand these dynamics of the economy in the Indian business firms and world-wide reduced export demand, we carried out the study which is focused on the concept of recession, causes of recession, the impact of the recession on business, employment, society. We further tried to analyze, why India did get impacted so less in the Great Recession 2008-09 and so high in the recent recession 2019-20?

The span of the impact of the recession is typically remaining in the market for 18 to 22 months; we found some gaps and tried to answer possible solutions for government, individuals, and business firms to overcome this recession. We tried to find a business strategy and its standardizing application for reducing the effects of the recession. We also tried to analyze recession as a business opportunity to explore new areas of opportunities and to reduce the denting effect of recession over the economy.

***Keywords*-**Concept of recession, Causes of recession, Impact of recession, Solution over the recession, recession as a business opportunity.

I. INTRODUCTION

A. Background

In finance, a recession is a shrinking of a product sale or demands due to reduce financial activity [1]. Recessions start when overall spending drop. This spending drop is by number of causes, namely an economic instability, trade issues, supply imbalances or breaking of sudden bulge in economy [2], United States define it as "Financial deals are reducing in themarket, it's time period may extend to a month or two, side effects can be seen in real Gross Domestic Product that is GDP of the nation, earnings of people, availability of the job offers, production in factory, and open market buying" [3]. United Kingdom defines it as a minus financial growth for continuous six months [4] [5]. During the recession prices of a product falls due to lesser demand. Further, lesser demand is the result of price rise or inflation in the economy. In a regular business cycle when a business rises over a given time span also gets slow over a period of time. An economy of a country usually expands over six to ten years and further tends toward a recession for usually six months to two years. West countries are also facing job cuts; there is a major drop in new job generation in the United States, and many companies have given lay off to employees with other actions like no promotion, facility cut for employees. Many organizations are working on their current products only without any new addition of basket. Forecast of demand also indicating that a job cut of more than one crore people happened in a current fiscal year ending in March. Tourism also affected badly in last June to September 2019 in India. The construction business also faced less cash flow where builders are facing financial problems to raise the money. In conclusion, the recession has reduced the positive expansion process and triggers the economic scholars for searching out alternatives to current processes to maintain the financial growth and balance of the country's which is expected for the flawless driving of the country economy. Governments plan to adopt reduced taxes, increased liquidity or raised government investments.

B. Objectives

a. To understand recession and its causes.
b. To analyze solution, strategy against recession.

II. LITERATURE REVIEW

A. Definition of Recession

A recession is a negative growth in nation's GDP that is a gross domestic product for consecutive more than six months. In recession sale or demand shrinks rapidly for goods and services due to high prices, lesser income, and priority shifts, etc

B. Cycle of Recession

In a regular business cycle when a business rises over a given time span also gets slow over a period of time. An economy of a country usually expands over six to ten years and further tends toward a recession for usually six months to two years. Consumers buy less when he loses trust in his earning ability. Lesser buying results in less demand for products and services which further results in less production. This less production condition raises the cost of production due to fixed asset investment.

C. Indicators of Recession

The actual GDPof any nation that is gross development product is the first recession indicator. When GDP reduces it indicates chances of recession. Growth may reduce in one quarter and again restore in next quarter. Hence, many times GDP based recession judgment goes wrong. To precisely predict the start of recession NBER measures the five statistics on a monthly basis. The decline in the following five indicators results in GDP decline and further, it results in a recession.

a. Actual earnings or individual income noted and balanced to inflation.
b. Welfare expenses and social safety spending's removed from it.
c. A monthly employment count is reported.
d. Manufacturing industry growth, as noted by the Industry Production Report.
e. Retail and original equipment manufacturer sales balanced for inflation.
f. The macroeconomic committee report for monthly earning is referred by NBER that is The National Bureau of Economic Research
g. Share market crash of more than 20 percent could result in recession as this condition is showing less trust of the investor on the market.
h. A total count of jobs in manufacturing and services is a probable recession's signal. Durable products order report display the actual demand booked or forecasted for the coming months.Reduction in this demand results in a reduction of jobs.

D. Recession latest Case Example

The Indian Gross Domestic Product that is GDP showing a continuous downward trend for the seventh quarter consecutively, it further reduced to 4.5 percent for the July-September 2019 that is a second quarter for the fiscal year 2019-20 [6]. Overall it is a reduction of 0.5 percent over the last quarter. If we compare with last fiscal year GDP then there is 2.6 percent shortfall over it. The GDP of the last quarter was the smallest of the last more than six years. This time dissimilar to previous recessions, housing sales declined first [7].

E. Why India did get impacted so less in the Great Recession and so high in the recent recession?

1) Why India did get impacted so less in the Great Recession of 2008-09?

- India is having a great agriculture product base market saved from a major lay off like other countries during the recession.
- The Indian banking sector had proactively not purchased the contract-supported loans which resulted to be deadly for western bankers.
- India's commodity sell in other countries was got major impact during the Great Recession but the service industry-supported the well as IT and BPO business performed well.
- Reserve bank of India reduced the interest rates and increased credit amount on government directions. Excise taxes reduced by the government to balance the demand.
- During a great recession, much old Indian organization kept a focus on their core competencies.
- Many companies learned to standardize the process of manufacturing to be more efficient by eliminating the loss of value during the process. A flexibility and fast action closure is key to survive.
- Planned off-loading of some part of business work which is causing high budget cost is a key between recession times. Short term money flow and fast cost-cutting are other alternatives being practiced.
- Rural people's higher earnings result in more buying of rural products hence rural marketing gets a boost in the country like India and China. The green revolution helped to raise the buying power by increased earnings. Hence rural marketing helped many companies like a shield during the recession. The rural business helped to explore the new areas as urban markets are mostly saturated [8].
- Maruti Suzuki an Indian giant automobile seller focussed on raising rural car sales by appointing 2000 sell persons in rural India. They also deployed dedicated vehicles to promote cars in rural India with cost benefits [8].
- Mobile operators also explored the rural markets to expand their business. The mobile industry's total customer count increased in 2008 by 48 percent; which includes eight million rural customers, which comprises 30 percent of the total number of the subscriber.
- Tata tea has started the "GaonChalo" initiative to raise the overall sell. This initiative was sustained with the aid of some NGOs in Utter Pradesh resulted in a rising in the sale from 18 to 21.4 percent.
- Some companies also focussed on overtaking and doing joint ventures during the economic downturn as the 'entry price' is comparatively to be lower than earlier as businesses are shrinking and under tension or to cash the available resource. This also helped them to acquire which otherwise was impossible.

2) Why India did get impacted so high in the recent recession of 2019?

The Indian economy GDP growth rate is reached to five percent in the fiscal year 20's first quarter [6]. Lowered GDP growth rate is an alarm of crucial business times for the next few days/months. NPAs mean non-performing assets are increasing in the business at the same time automobile sales are continuously declining. The downfall in the economy is also a result of the different dynamic factors such as [9]-

- China-United States business war is increased over the last few months. It is shrinking the world

business and similarly export business in Indian firms.

- Another major factor is GST means Goods Service Tax higher percentage.
- Cash flow issues cause a change in the pattern of behavior of the workers mainly due to the employment of fresher which results in lesser savings. Less saving by people results in fewer investments in the economy.
- Further, Health and education sectors are not focussed well as it has the potential of structural change for long term planning.
- Economist Intelligence Units predicts the slower rate of economic growth for quarter four of fiscal year 20 and will face issues like trading conflicts globally, imbalanced new market; and European countries' political dynamics.
- Indian Finance Minister's latest offerings are more concentrated on the supply of products only. Hence, it does not reply to the issues of lesser demand.
- Government continuous focus on the big highway, infrastructure projects and less concentration on small basic business that gives quick gains.
- Only retail credits given by banks are performing well, rest everywhere consumption of the product is declined. Indian market, consumption constitutes 60 percent of the economy. Consumption reduction definitely results in downfall in the economy.
- Automobile domestic sales declined drastically from April to June 2019 by 23.3 percent compared to the same time span of the last year 2018. Automobile sales slowdown adversely impacts other suppliers like tyre, steel, and steering suppliers as a backward chain. In forwarding chain, many automobile selling dealerships are closing or reducing their business. Also, the growth of car loans has reduced to 5.1 percent and it is the slowest in the last five years [10].
- The rural market demand indicator is a tractor sales and it reported a major decline of 14.1 percent from April to June 2019 which is the biggest fall in the last four years.
- The total cost of the announcement of the new projects for April to June 2019 stood 71,337 crore Indian rupees. It is declined by 79.5 percent compared to last year for the same time span.

F. Gaps Found

- GST means Goods Service is deployed at different rates on different products and services. GST rate is 18 percent for bathing soaps and 28 percent on washing powder. GST rate on cinema tickets is constructed stepwise, with 18 percent GST for movie tickets which cost Indian rupees100 or less and the GST rate is 28 percent on movie tickets cost larger than Indian rupees 100. For commercial vehicle, GST rate is 28 percent and the GST rate is five percent on clothes [11]. The GST rate for in construction process booking is 12 percent[12]. World Bank in 2018 said on Indian economy growth that GST structure in India as too complicated, shown number of errors in comparison with GST structure applied in different nations; Keypoint identified that in an analyzed 115 number of nations the Indian GST rate of 28 percent is the second-highest tax rate [13].
- The export business in Indian companies is shrinking.
- Youth is not focussed on saving money which results in fewer investments and less liquidity in the economy [14].
- The Indian government is mainly focussed on the supply of products only during the last budget offerings; also they are investing more on highway corridor, metro projects, and infrastructure projects [15].
- The real buying of products and services is declined drastically.
- The rural market is not explored in a big way.
- The real buying of products and services is declined drastically after COVID 19 Pandemic.

III. PROBABLE SOLUTIONS OVER RECESSION

We have seen some businesses running successfully during this recession period. We also have seen some films like URI the surgical strike; Kabir Singh has done exceptional business at the box office. This success got accomplished by proactive plans, strong quality based work content, and deployment of it with solid business plans.

A. A possible strategy to be practiced by the government

- The government must concentrate on the export business to raise foreign direct investments. Different steps should be taken by the government to add cash flow into the economy, boosting the banking process and other related financial institutions. To raise the global trading government should find the opportunity to get financial aid from the country who less affected by recession periods.
- The government should reduce their overhead cost by outsourcing the work content and creating the business opportunity at less cost.
- Different taxes are the source of income for the governments. Downturn in tax collection results in the economic downturn and has a bad impact on public welfare. There should be an assessment of the tax collection system and ideas should be generated to raise the tax collection. Efforts should be done to make accountable many citizens for paying or evaluating for taxes to raise the income of government.
- Efforts on social well-fare by governments help to restore the loosed trust of citizens over thecountry economy. United States, China, and Australia are practicing the stimulus aid package method for their country residents. United States government has given a $170 billion in 2009 as a stimulus

package that included rental checks to be sent to 117 million middle and low-earning level people. China's government has given stimulus aid of 4 trillion Yuan on 9th November 2008 to control the recession hit which is the 4th biggest economy. Australia government was also gave $7.4 billion in fiscal stimulus aid to control the recession in this big financial depression. This stimulus aid is used to improve social well-being and country infrastructure by the year 2010. This stimulus aid resulted in a good boost to the country economy and people's trust over the government to fight with the recession.

- The cash-filled by Indians, mainly government officials, politicians, and some business persons, in the Swiss Bank has reached up to a big amount of US dollar 1,450 billion which is 1.8 times the Indian GDP. While similar to the other countries, Indian financial condition too facing the recession and need a big amount of cash flow to control the situation.
- The government should focus to improve the tourism and tourism-related business. More cash flow happens if more tourists visit our country. Kashmir inclusion in India and its unstable condition for the last six months also cost lowered tourism in India. Tourism is also one of the main earning sources for foreign currency and there is a scope to raise this source of earning significantly.

B. Possible strategies to be practice by business firms

- In general, the top 20 percent of customers give 80 percent of business as per the pareto chart principle. In bad times, every company should go with the most trusted source of customer base only and pre-plan smart, cost-effective and strategic marketing to explore the untouched area to occupy possible new markets.
- Rethink over some product range costing to explore those customers who can't afford our products. During high demand time work on smaller quantity is overlooked but recession time allows a time to work on cost-cutting ideas. Find a business partner to promote our products during the recession by exchanging our products and services with them for their support.
- Keep the focus on own healthof the employees to be fit and tackle the stress at work.
- Try to do networking or reach new people, start referral programs based on your business quality offerings for exploring the business opportunity in diverse sectors.
- Use technology very effectively. Many repetitive tasks can be automated, and give a saving of time and money. Outsourcing the low-value task is a great solution to achieve a major savings in time and money.
- Use the internet effectively, keep on emailing the customers about our product, its features, and new products, offers to remain continuously in front of the customer. If we don't do so others will take our place.
- Aggressive advertising by contacting current clients and following the standard practices required by marketing teams to remain in the market.

C. Business opportunities during Recession

1. Construction Sector: The major impact faced business in India and worldwide is the construction Sector. The supply team should start offering real demand, for example, mid or lower size homes to the customers which they can afford easily.
2. Development through Innovation: The buyer basic requirements are remaining the same as food, home, clothing, and pharmacy. The manufacturer needs to develop cost-effective solutions over it time to time for remaining in competition during the recession.
3. Internet and Mobile phone usage: The rising spread of the internet in the Indian rural market allows the chance to many entrepreneurs to work on breakthrough solutions in internet technology and mobile phone parts and accessories.

IV. CONCLUSION

In the period of recession, Business firms need to focus on our loyal customers and need to analyze how they are reacting to the change. Automation efforts at work, waste elimination through the process, and efficient marketing help to sustain the business. The business firms should focus on export to raise foreign currency in our country. Government needs to control and stabilize the higher GST rates. The Indian government is mainly focused on the supply of products only during the last budget offerings; they need to balance the supply as well as the demand of the product. Further, they need to invest in the basic needs of common people to build trust on the economy and raising the spending power of the common man. Youth is not focused on saving money which results in fewer investments and less liquidity in the economy, Government needs to launch and create awareness in money-saving programs to raise the cash flow in the market and financial sector. The rural market of India contributes to around 65 percent of the population hence their need must get the address and effective marketing programs for raising awareness about product and service availability required.

The main motive is removing the obstacles of cash crunch in the economy through a balance of sales and demand of products or services. Further, we need to spread its awareness in common man which will improve the trust of everyone on the nation's economy.

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A Study of need of Artificial Intelligence in Project Management Practices with emphasis on Risk Management and Analysis for efficient execution of Projects

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Abstract

Projects are new beginnings in many ways. Whether it is the launch of a new car or development of new software, product, it needs planning, design, execution, and monitoring before the final product is delivered.

Project management is the science and art of sequencing and stringing all these activities together into a coherent whole to ensure that the final delivery meets the desired specifications. Every complex project comes with its own problems and challenges, and good project management practices help overcome them.

Project management is like juggling three balls (cost, time, quality) simultaneously as it involves maintaining a fine balance between delivering on time, within budget while ensuring quality.

Project Management is associated with varied perspectives of Risk identification, Risk analysis, risk management and aspects of management, comprising legal concerns, project management, Technology management, supplier management, cost management etc. All these aspects are all indispensable elements for success of projects.

In the R&D projects, Project and Risk Management has become a topic of frequent discussion in recent time. Although it is agreed both in theory and in practice that the Risk Management is essential, it is still a challenge to identify the issues associated with identification of internal and external Risks, such as motivation, benefits and costs, selection process and implementation.

This research aims to analyse the knowledge level of the project managers in the Project management process and project risks management and investigated of results and conclusions drawn from the analyses to be used for further research. It also aims the reason for formulation of Artificial Intelligence based framework into Project Management Practices with emphasis on Risk Management and Analysis for efficient execution of R&D Projects

Keywords: - Risk Management, Project Management, Technology management, supplier management, cost management, budget, Artificial Intelligence

1.0 Introduction

The worldwide industry is often characterised by major delays in development and delivery of large R&D programmes. Suppliers often suffer financial losses and reputational damage as a result of underestimating project risks.

This research investigates the knowledge level of project and risk management practices of the project managers and application of risk management principles and behaviour required for project teams for execution of projects.

Risks in R&D activities in various industry are an important topic today, considering the fierce competition coinciding with globalization. Getting the R&D task done within cost and time schedule is an increasingly common way for firms to survive in the business considering the right mix of internal and external risks. The current problem is not only of identifying a suitable risk, but more important is how to do risk analysis and mitigation to reduce the overall negative impact on the project.

Programmes such as the aerospace/IT industry initiative have created several opportunities to participate in high-profile programmes. There are, however, several project-specific risks that should be taken into account when exploring new business opportunities, R&D activities or continuing to do business in this environment. A lack of understanding of these specific risks often leads to project failure with resultant overspending, late deliveries and loss of credibility as a supplier.

Although a lot of research has been done on risk management in general and also on the R&D programmes, this investigation will provide insight into the specific knowledge levels associated with projects and the results of the investigation could be useful to upcoming projects of industries.

Various R&D projects are very nature complex endeavours that usually involve a high level of risk and uncertainty. It is often said about R&D projects: "Risk cannot be avoided, but must be managed."

The root causes average knowledge level of project risk management in industry need to be identified and investigated and results and conclusions drawn from the analyses can used to make recommendations and actions for execution of R&D projects.

This research paper will be extremely useful for project managers and project team members as it may enable to:-

- Understand the process requirements of project risk management
- Supply guidelines for the risk identification and analysis

- Identify ways for risk mitigation
- Identify the need of AI into Project Management Practices especially for Risk Management

2.0 Problem Statement

Various new R&D projects towards development of critical sensors, new technologies, systems used are being initiated on large scale. However during project design, implementation phases, how much important is given to project management, Risk analysis and management is a key question, hence study of same is important to understand the basic knowledge of project management and risk management.

3.0 Objectives

- To study the relevant literature on project management, risk and project risk management with specific emphasis on the application of risk management
- To investigate the knowledge levels of project teams working at R&D industry regarding the application of project risk management principles and processes.
- To investigate the opinions of project team members regarding the quality of project risk management as applied in R&D projects
- To investigate the attitudes of project team members regarding the application of project risk management in R&D projects
- To identify areas for improvement in project risk management in R&D projects

4.0 Hypothesis

The motivation for this research is based on the hypothesis that there is significant scope for improvement in project risk management.

5.0 Purpose of the research

The main purpose of this research was to determine the knowledge levels of project managers in project management and project risk management in R&D projects.

The following components were analysed with respect to Project Managers

- Knowledge and experience of project managers with respect to project management and risk management practices
- Level of compliance with risk management principles and procedures

- Attitudes of project teams at industry regarding project management and risk management practices

6.0 Need for research in this field

The knowledge level of the project managers in the Project management process and project risks management need to be identified and investigated and results and conclusions drawn from the analyses to be used as a basis for recommendations on how to improve the project management and risk management process in R&D projects.

7.0 Research design procedure

The research procedure included a study of the relevant literature to obtain a better understanding of the theory and application of risk management principles in projects.

Quantitative research methods: Quantitative research methods involve either identifying the characteristics of an observed phenomenon or exploring possible correlations among two or more phenomena. Descriptive research examines a situation as it is. It does not involve changing or modifying the situation under investigation nor is it intended to determine cause and effect relationships.

Qualitative research methods: Qualitative research methods focussed on phenomena that occur in the "real world" in all the complexity. Qualitative researchers recognise that the issue has many dimensions and layers to portray the issue in its multifaceted form.

This research included both qualitative and quantitative research. The research project focused on three target groups, namely: senior management, project and programme managers and project team members.

Quantitative research was conducted in the form of a questionnaire from which the results were statistically analysed using exploratory statistics; the results are represented graphically with the aid of graphs and pie charts.

The qualitative research consisted of personal one-on-one interviews with current project managers, senior managers and other project personnel.

Systematic review, the methodology applied in this research, is one kind of literature review but different from traditional review.

8.0 Deciding on the data requirements

Sample population

The population used for this study consisted of employees from the R&D project environments and was aimed at various sections and management levels.

Sample size

A simple random selection methodology was used in inviting respondents to participate in the survey. The objective was to randomly invite people from the project environment to participate and to ensure a representative response from all organisational levels and various sections. Questionnaires were distributed to randomly selected respondents within the various sections of the R&D centre.

9.0 Survey Questionnaire

Following guidelines were used as design criteria for the development of the survey questionnaire for this study.

- Keep it short.
- Use simple, clear, unambiguous language.
- Check for unwanted assumptions implicit in your questions.
- Check for consistency.
- Keep the respondent's task simple.
- Provide clear instructions.
- Give a rationale for any items whose purpose may be unclear.
- Make the questionnaire attractive and professional looking.

10.0 Preliminary considerations

The following considerations were taken into account before formulating the questions:

- What information is required?
- Who are the target respondents?
- What data collection methods will be used to survey these respondents?
- What analytical methods will be used to interpret the results?

11.0 Structure of the questionnaire

The structure of the questionnaire was aligned with the objectives of the research as indicated below.

- The first section of the questionnaire called for demographic data about the respondent's age, experience, qualifications, membership of professional organisations and experience of project management and project risk management. This section of the questionnaire was aimed at obtaining data to determine whether demographic and experience variables had any influence. A second objective was to determine whether the sample criteria were met w.r.t representation and experience.
- Theoretical questions included in the second section of the questionnaire were aimed at determining the knowledge level of respondents regarding project management.
- The second section of the questionnaire was aimed at determining the respondent's perception(s) of the quality of and compliance with risk management principles. This section included subsections on the following:
    - Project management
    - Project risk management
    - Project risk planning
    - Project risk identification
    - Project risk analysis
    - Project risk prioritisation
    - Project risk monitoring and control
    - Project risk resolution
- General project risk management questions
- Attitudinal questions
- Care was taken to ensure that questions were not constructed in ways that gave clues about preferred or more desirable responses. The pre-test was done after consensus had been reached on the format and content of the survey form.

12.0 Processing received responses

The results of all returned questionnaires were captured in an database. The database was developed in parallel with the survey questionnaire in order to determine whether the responses

would satisfy the data requirements of the research process as well as comply with the format for the presentation of findings and conclusions.

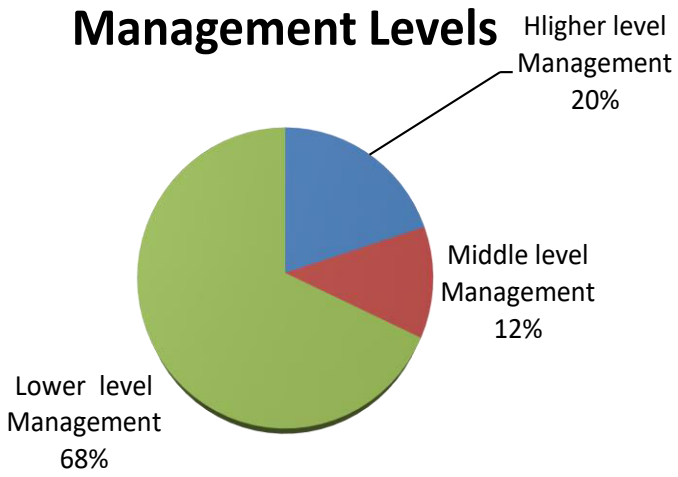
13.0 Statistical analysis of the data

Responses were analysed using the software package. Responses were analysed as per management level.

14.0 Result, Discussion of Results and Findings

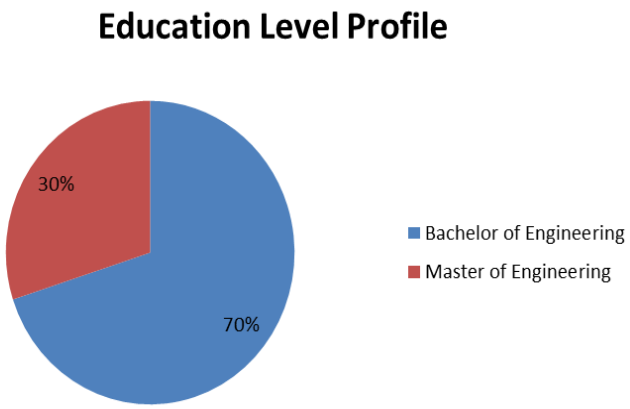
14.1 Respondent Profile

Break Down of Respondents as per Management Level



The respondents were a highly experienced group at various management levels

14.2 Respondent Education Level Profile



The respondents were a group of well-qualified people, most of whom held engineering and other technical qualifications.

14.3 Respondents' membership of professional organisations

Majority of the respondents are currently members of professional bodies and the organisations in their fields.

14.4 Respondent Project and Project Risk Management Training

Most of the respondents have completed formal project management risk and risk management training

14.5 Summary of the results for all project management questions

The overall result for project management knowledge level questions was very good. Higher Level Management, Middle Level Management and Lower Level Management all were having very good project management knowledge.

14.6 Summary of the Project Risk Management questions

The overall result for project risk management knowledge level questions was good. Higher Level Management, Middle Level Management and Lower Level Management all were having good risk management knowledge.

14.7 Summary of Risk Management in R&D Projects

The overall result for project risk management knowledge level questions was found to be average. Higher Level Management, Middle Level Management and Lower Level Management all were having average knowledge in risk in R&D projects.

15.0 Conclusion

Overall findings, analysis and discussions correlate with the research design and satisfy the stated goal, objectives and hypothesis.

16.0 Recommendations

The following recommendations are made for future research:

- A detailed investigation into project risk management process within various R&D centres, industries and global R&D Centres
- Further investigation for the future role of Artificial Intelligence solutions as the natural next step in aiding the organization to manage project and risk management successfully.
- Formulation of Artificial Intelligence based framework into Project Management Practices with emphasis on Risk Management and Analysis for efficient execution of R&D Projects

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COVID-19 Impact on the Consumer Mall Buying Decision Making

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ABSTRACT

The COVID-19 is a worldwide pandemic of coronavirus disease 2019. The World Health Organization mentioned the epidemic, an international issue of Public Health on 30 January, and a pandemic on 11 March, 2020. 10 million COVID-19 infection cases have been identified in 188+ nations, emerging in 5,00,000+ deaths as of 30 June 2020. Preventive actions guided are washing of hands by soap for at least 20 seconds, a face mask wearing, social distancing, and quarantine for suspected people for infection. The consumer behaviour involves all parameters of buying behaviour from pre-buying to post-buying usage, rating and discarding actions. We studied the COVID-19 overall spread, signs and symptoms, diagnosis, viral testing, deaths, and prevention measures available in the literature survey. We further studied the consumer buying behaviour concept through standard model and Howard-Sheth model in detail through literature survey. We found out the limitations of buyers such as social distancing, no travels, and buying budget cuts as a part of the preventive measures over COVID-19 spread. We further calculated the true sample size of 400 numbers and done a sample survey over the different respondents in the Nasik city to understand the buyer's preference and we analysed that that buyers online shopping preference over shopping mall changed from overall 31 to 62% that is by 200% and in future also it is showing the sustenance with 206% overall in all category of product. We conclude based on the above research study that COVID-19 impacted the buyer's behaviour of physical shopping at shopping malls and their preference changed and increased dramatically towards online shopping.

Keywords: Consumer behaviour, COVID-19, Howard-sheth model, Mall shopping in the Nasik city, Online shopping

INTRODUCTION

The COVID-19 is a worldwide pandemic of coronavirus disease 2019. The epidemic was spotted first in December 2019 at Wuhan, China (Huang *et al.*, 2020). The World Health Organization mentioned the epidemic an international issue of Public Health on 30 January, and a pandemic on 11 March, 2020.10 million COVID-19 infection cases have been identified in 188+ nations, emerging in 5,00,000+ deaths as of 30 June 2020. The virus is spreading mostly through sneezing, coughing, and talking people. The cough drop falls to the floor or ground rather than air travel over long length. Infection may happen by hand contact with a contaminated floor and then face touching. It is considered to be most contagious for the three days after the identification of infection or symptoms, although infection may happen even before disease identified, and from affected one who do not show disease symptoms. Main symptoms identified are fatigue, temperature, sneeze, pneumonia, and smell sense loss. The subjection to symptoms period is roughly five days but it may start from two and extend up to fourteen days (Velavan and Meyer, 2020). As of now there is no vaccine or precise antiviral therapy available over this

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epidemic. Preventive actions guided are washing of hands by soap for at least 20 seconds, a face mask wearing, social distancing, and quarantine for suspected people for infection. Globally air travel restricted, workplace sanitizations done, and lockdowns deployed in the whole countries. It cancelled or delayed many political, sporting, and religious events. Schools, colleges, and universities have been closed in 172+ countries, affecting roughly 98.5% of the world's student count.

CONSUMER BEHAVIOUR

Consumer behaviour is defined as "the study of individuals, groups, or organizations and all the activities associated with the purchase, use and disposal of goods and services, including the consumer's emotional, mental and behavioural responses that precede or follow these activities" (Kardes *et al.,* 2011) (BusinessDictionary.com, 2019).

OBJECTIVE

We want to analyse the impact of COVID-19 on the consumer buying behaviour about mall shopping behaviour in the Nashik city.

LITERATURE REVIEW

Background

China health department reported to the WHO a series of pneumonia incidences of not known reason in Wuhan, Hubei, on 31 December 2019. The WHO communicated the epidemic as "a Public Health Emergency of International Concern (PHEIC)" with 7,818 cases happened worldwide that infected 19 nations in five regions of the WHO on 30 January 2019. SARS-CoV-2 is the newly coined virus name that closely resembles the coronavirus family of the bat, pangolin, and SARS-CoV (Sun, Jiumeng *et al*., 2020). The scientist believes that COVID-19 has a natural origin (Perlman, 2020). Bat infection is transferring to human probability due to bat skeleton and excretion usage in the Chinese medicines manufacturing (Cyranoski, 2020). On 11 March 2020, the WHO mentioned the COVID-19 outbreak as a pandemic.

Signs and Symptoms

COVID-19 symptoms can be comprehensive; fever and dry cough are two main symptoms identified. Other symptoms identified are higher sputum level in respiratory system, fatigue, smell sense lost, taste loss, breathing issues, pain in muscles, throat soaring, pain in head, vomiting, sneezing, and rash (Arons *et al.,* 2020). Sudden Signs Are breathing problems, continuous pain in chest, hesitation, and blue colour lips; if listed symptoms are seen, one must need immediate medical treatment. Situation can go further to problem like renal failure, pneumonia, respiratory problems, blood poisoning, and infections shock (Grant *et al.*, 2020 and Agyeman *et al.,* 2020).

Transmission

COVID-19 spreads when person is in contact with an infected person who leaves droplets through sneeze, talks, cough, or singing (Carl Heneghan *et al*., 2020). When the virus infected droplets spread on surfaces or floor, it become infectious if person contact infected surfaces and then his nose, eye, or lips with his hands (Jayaweera, 2020). Surfaces are cleaned with sanitizers or disinfectants which removes the virus. Phlegm contain huge amount of virus (Van Doremalen *et al.,* 2020). The Night clubs, funeral, and marriage halls are spreading points observed in some studies (Kohanski *et al.,* 2020).

Diagnosis

COVID-19 may be spot from symptoms and concluded using RT-PCR that is reverse transcription polymerase chain reaction test of infected saliva or chest CT image (Andersen *et al*., 2020).

Viral testing

The RNA testing process for SARS-CoV-2 collects swab from nasal secretions. This test check sactual-

time rRT-PCR that identifies the existence of pieces of viral RNA.

Deaths

500,000+ COVID-19 affected people passed away as of 30 June 2020. On 9 January 2020 the first death was confirmed in Wuhan. On 1 February 2020, the first death occurred in the Philippines outside of China and on 14 February, the first death outside Asia occurred in France (Rothan and Byrareddy, 2020). The death-to-incidence or case ratio defines the deaths count caused by COVID-19 divided by the identified cases for a specific period. Other similar calculations available are CFR that is the case fatality rate which explains the percentage of identified patients who die due to COVID-19, and IFR that is the infection fatality rate which explains the percentage of total identified and unidentified who die due to a COVID-19.

Prevention

Strategies for preventing transmission of the disease include,

a. Washing of Hand: The CDC guides that we do hand washing usually by water and soap for twenty seconds at least, mainly after use of the toilet or when our hands are dirty; at eating time; and after nose cleaning or sneezing. Soap breaks virus outer bubble and kills it. CDC also guides using a sanitizer having 60+ percent alcohol content by volume. The WHO guides for not touching the nose, eyes, or lips with hands (Li and Xia, 2020).

b. Surface cleaning: The CDC recommends that if a COVID-19 case is suspected or confirmed, then clean all areas such as offices, bathrooms, common areas, shared electronic equipment like tablets, touch screens, keyboards, remote controls, and ATMs used by the ill persons should be disinfected.

c. Mask: The WHO earlier guided that people shall wear a mask only if they are vulnerable to an infected person for COVID-19 (Nussbaumer-Streit *et al.,* 2020). The WHO revised its guidance in June 2020 on masks usage that must be worn at public to prevent the COVID-19 spread.

d. Social Distance: To reduce the growth of infection, the contact between people should be minimized. This Concept includes stopping travel, closure of schools, sport facility's, malls, movie theatres, and isolation. People may practice distancing concept by home stay, no travel, and isolating each other's (Li and Xia, 2020). The safe assembly size given by U.S. government authority had been 250 earlier to 50 people's, and further to ten. Adults and people having previous medical problems mainly heart issues; diabetes, respiratory issues, and risk of serious illness are advised by CDC to stay at home.

What is the Consumer behaviour?

The consumer behaviour involves all parameters of buying behaviour from pre-buying to post-buying usage, rating and discarding actions. It also study's all people who are contributing in product buying and usage actions. It includes influencers who give their opinion on specific brand.

Consumer Buying Behavioural Model (Standard)

The consumer buying behaviour standard model is a structured decision making and buying process. Let's understand it in detail step by step as below:

a. Recognition of the need or problem by the probable buyer: In the first step the probable buyer identifies the need or wants that needs a solution.

b. Search for information for solutions of identified need or want: In the next step probable buyer collects information for solution of his need or want on the available media like internet, phone calls, friends, and shops.

c. Rating the solutions found: Probable buyer further rate the collected information of the solutions found

out based on his budget, the lead time of availability of the product or solution, and its brand value.

d. Actual Buying: In this step probable buyers finalize his buying decision. It mainly depends on the precise solution over his need with optimum features like cost, availability, brand image, guarantee, and after sale service.

e. After buying performance rating of the product or service consumed: The Buyer Rate the product or service which he consumed over his satisfaction (Study.com, 2020).

Howard-Sheth consumer buying behaviour Model

Howard and Sheth gave the Howard Sheth consumer buying behaviour model in 1969 that analyses the complete impact of the product marketing, buyer psychology, and social parameters on the buying choice of the buyers. This model consist of three decision making levels as explained in Figure 1.

a. Complete Problem solving: It is the first step of the model where the consumer is completely new for the selected market. Buyer doesn't have a precise choice about the product or its brand and also doesn't have the product information. Thus buyers try to collect information about different brands of the required product in the market.

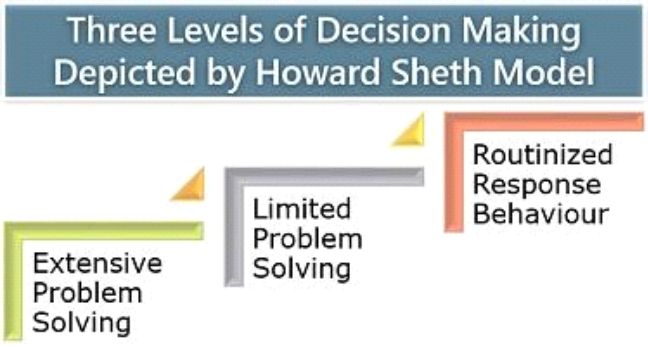


Figure 1: Howard-Sheth three separate decision making levels

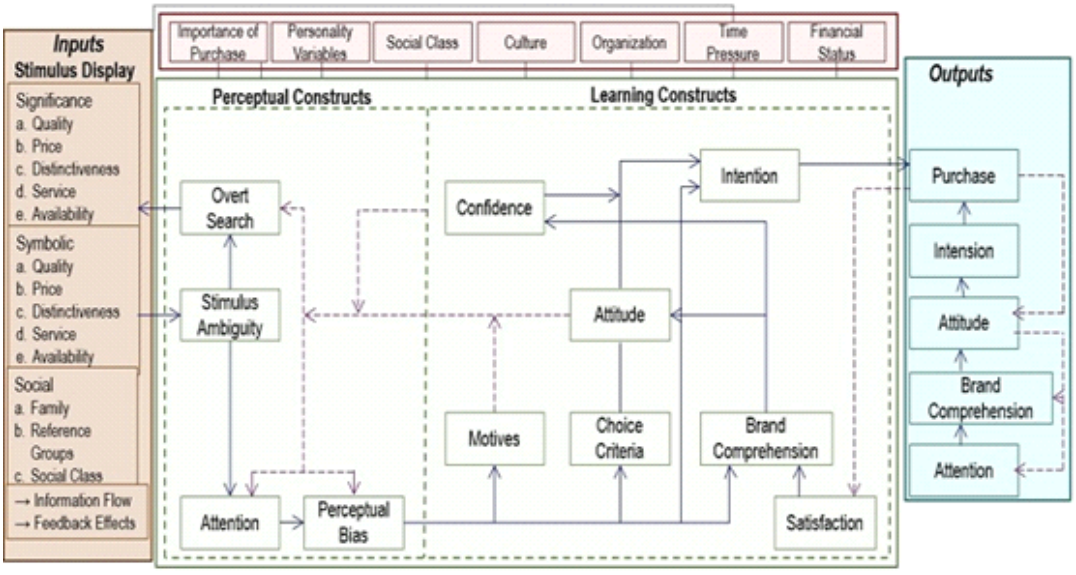
b. Limited problem solving: It is the second step where buyers have a half or partial information of the product or services he wanted to buy and he gets confused. He also tries to make comparisons of the various products and services available in the market.

c. Familiarize reaction behaviour: It is the step where the buyer completely aware of the product or services that he wants to buy. He takes the buying decision in advance under this stage.

Let's have a detail structure or design study of the Howard-Sheth model as mentioned in Figure 2.

There are four different variables such as input, hypothetical constructs, output, and exogenous are

Figure 2: Howard-Sheth buyer decision making behaviour model (Prachi, 2019)



involved in the Howard-Sheth model that impacts the actual buying decision making process explained below one by one (Prachi, 2019).

a. Input Variable: The input stimulus is the information about the product and its features like cost, quality, and services offered. These stimulus can be further differentiated as below,

1. Significant: These are the physical features of the product. It can be cost, quality, services, and availability.

2. Symbolic: These are marketing actions like advertising or promotional offers that create psychological impact on the buyers mind or perception about the product.

3. Social: These include various factors around the buyer like his class, lifestyle, family values, and friend groups.

b. Hypothetical Constructs: It is the central area of the model. It includes mainly all the psychological variables that impact buyers' minds. These variables can be further divided into two separate types as below,

1. Perceptual Constructs: It explains the buyer's perception over the input stage information received by him. It has an importance as it decides buyers product selection and actual buying decision that includes response to information that is buyers openness towards the information received, perception based bias that is buyers partiality for selected brands based on his perception, and information search that is buyer try to find more product information to have correct buying decision.

2. Learning Constructs: It gives data regarding consumer's perception, attitude, knowledge, and final decision on product buying. Few learning constructs of the buyers can be buyers motive that is buyers purpose of buying the product, choice that is sorting criteria set by buyer, product understanding that is buyers knowledge about the product that he is opting to buy, attitude that is buyers own attitude or lifestyle, buyers trust on different products, and satisfaction of buyer based on after purchase usage and its evaluation.

c. Output Variables: These are the final buying result by the buyer based on input he received. It mainly consists of the five parameters that can be attention that is buyers alertness about input information he gets about the product through various media, product understanding that is buyers understanding about given product, attitude that is buyers rating for a brand based on his personality, interest, and awareness towards product or brand, intention that is buyers motive for buying the product, and buyers buying behaviour at the end is the concluding result of the all above mentioned variables.

d. Exogenous Variables: Some additional factors also affect the buyer buying behaviour. These can be explained as below,

1. Buying importance: If buyers plan a low price item that is of less importance to him then there is less buying choices.

2. Personality of buyer: Buyers own behaviour like anxiety, ego, and own pride may affect the buying decision and choice of the product.

3. Class of buyer: Buyers class in public, his living morals drives his buying choice.

4. Culture: Buyers value trust and religion may control over his buying behaviour.

5. Financial status: The buyer's budget to buy the product is the restricting criteria for actual buying of the product.

6. Time limits: Buying decisions are always precisely time bound and choices and needs may differ according to changed time frame.

7. Family groups: Friends, family, and social groups around the buyer impacts his taste about the product buying.

Limitations Found in the Literature Survey

We found some buyers limitations in the literature survey study on the COVID-19 pandemic preventive precautions and consumer behaviour as below:

1. We need a social distancing or no travel as a precautionary measure for restricting the spread of the lethal disease.
2. Buyers are also avoiding the mall, physical, or group shopping as a part of COVID-19 spread or infection precaution.
3. Buyers are also focussing on the daily use or house hold product or spending less money over the premium products.

METHODOLOGY

This research work uses the quantitative approach with a target of analysing and improving the relationship between-

a. Dependent variable-Product Sale.
b. Independent variable-Consumer Buying behavior about buying in a shopping mall at the Nasik city during COVID-19.

Problem statement

Is product sales getting impacted due to consumer Buying behavior about buying in shopping malls at the Nasik city during COVID-19?

Primary Data Collection

We decided to use a sample survey tool with set of questionnaire with shopping mall buyers in the Nashik city. We calculated the true sample size with the following considerations such that we have a population of 1,30,000 buyers doing shopping from various shopping malls at Nasik city with rough overall population of the 24,00,000.

True Sample size calculations: We desire a 95% confidence level and 5% error margin for the 1,30,000 population sample size calculation,

a. Size of Sample = (0.5 x (1-0.5)) / ((0.05/1.96)Sq)
   = 0.25 / ((0.02551)Sq)
   = 0.25 / 0.00065

Size of Sample= 384.16 Numbers

b. True Size of Sample = (384.16x 130000) / (384.16 + (130000 – 1))
   = 384160.3024 /1383.16

   True Size if Sample = 383.03 Numbers

   = 400 Numbers roughly.

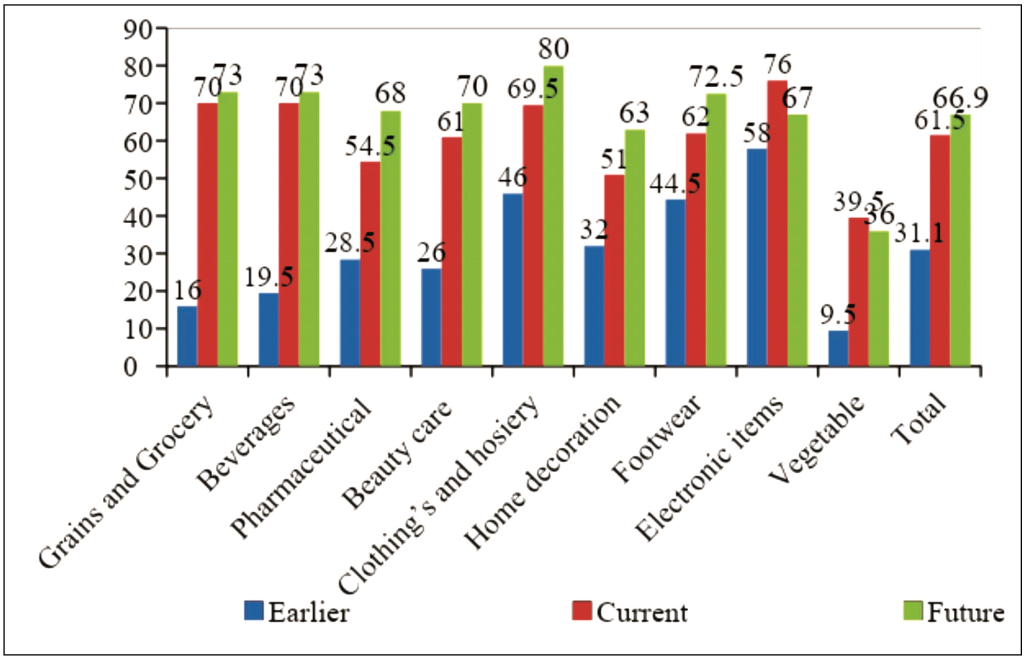
Based on the above true sample size calculations with 400 response requirement of different buyer's preference for the online shopping earlier, current, and future in COVID-19 pandemic for buying the products in various category like cooking raw material like grains and grocery, beverages, pharmaceutical prescription, cosmetic and beauty care items, clothing and hosiery, home decoration, Footwear, electronic items, and vegetable. We found out the consolidated online shopping preference response of the all 400 sampled buyers for the online shopping earlier, current, and future in COVID-19 pandemic for buying the products in various category over the above set of questionnaires mentioned in the total percentage is as Figure 3.

FINDINGS AND ANALYSIS OF THE SAMPLE SURVEY

We found out based on the 400 sample survey that,

1. Buyer's behaviour on shopping preference during and after COVID-19 changed at the Nasik City with big margins.
2. Nasik city sample survey results can be analysed that online shopping preference over shopping mall changed from overall 31 to 62% that is by 200% and in future also it is showing the sustenance with 206% overall in all category of products.

Figure 3: COVID-19 impact on Consumer mall shopping behaviour at the Nasik City



Recommendations for Mall business

Based on the sample survey results in the Nasik city, Mall shopping is facing and going to face a major business loss in the coming future. To adapt this COVID-19 changed buying situation shopping malls,

1. Need to create the more home delivery options,
2. Direct contact with previous buyers through promotional strategy,
3. COVID-19 preventive precaution adaptations like social distancing to build the trust in the probable buyers.

CONCLUSION

The COVID-19 a worldwide pandemic of coronavirus disease 2019 changed the consumers buying behaviour by an inputs of preventive measures like social distancing, no travel policies by the government authority's, and probable job cuts or reduced earnings. This change resulted in the consumers reduced or no physical buying at the shopping malls. Our sample survey of the 400 respondents in the Nasik city also says that buyers' online shopping preference over shopping malls changed from overall 31 to 62% that is by 200% and in future also it is showing the sustenance with 206% overall in all category of products. We conclude based on the above research study that COVID-19 impacted the buyer's behaviour of physical shopping at shopping malls and their preference changed and increased dramatically towards online shopping. In this situation we also recommend the shopping mall to work on the options like home delivery, connect with the old buyers through promotional strategy, and follow the COVID-19 social distance precautions to build the trust in the probable buyers.

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A CONCEPTUAL STUDY OF THE SUPPLY CHAIN MANAGEMENT 4.0 IMPLEMENTATION PROCESS

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Abstract

Today the supply chain has evolved tremendously from a fixed job of a bridge between sales and production functions with a focus on raw material supply to product manufacturing lines and finish goods dispatch to the final consumer to an independent function with a separate hierarchy. The SCM focus has adopted the upgraded planning methods such as integrated S&OP and outsourced logistics. Further, the world has seen continuous wealth shift towards the rural areas over the past few years and the online product purchase is rapidly increasing due to the buyer's trust in communication transparency and easy much option access. To adapt to these trends SCM requires being faster, granular, and precise.

The Supply chain efficiency can be increased by up-gradation with new technology and eliminating the waste in the process. We studied the step by step SCM 4.0 implementation process to achieve the SCM 4.0 application benefits like global inventory and lead time reduction with the help of digitized material planning, order fulfilment, and forecast accuracy. We have analyzed the key six value SCM 4.0 enablers as improvement levers that will generate a change in capital cost, manufacturing agility, and service are planning, physical flow, performance management, order management, collaboration, and strategy.

Further, We carried a pilot study on SCM 4.0 implementation with current state mapping of value chain identified the wastage like manual data capturing, manual planning based on gut filling, low service levels, and high inventory that can be prevented or eliminated by the effective SCM 4.0 application. Also, We noted that SCM 4.0 deployment face some problems like training needs and skilled talent, senior leadership involvement, change management, and small and medium business needs tailor-made solutions.

Keywords: SCM 4.0, Cloud, Digitization, Digital Waste, Big-Data.

Introduction

Today the supply chain had evolved tremendously from a fixed job of a bridge between sales and production functions with a focus on raw material supply to product manufacturing lines and finish goods dispatch to the final consumer to an independent function with a separate hierarchy. The SCM focus has adopted the upgraded planning methods such as integrated S&OP and outsourced logistics. Further, the world has seen continuous wealth shift towards the rural areas over the past few years and the online product purchase is rapidly increasing due to the buyer's trust in communication transparency and easy much option access. To adapt to these trends SCM requires being faster, granular, and precise [1].

A. Definition of Supply Chain 4.0

SCM 4.0 model is the integration of IoT, AI, and big data analytics by deploying the sensor, network, automation, and data analysis tools in every process for improvement in consumer satisfaction [2]. It is explained in the following figure1.

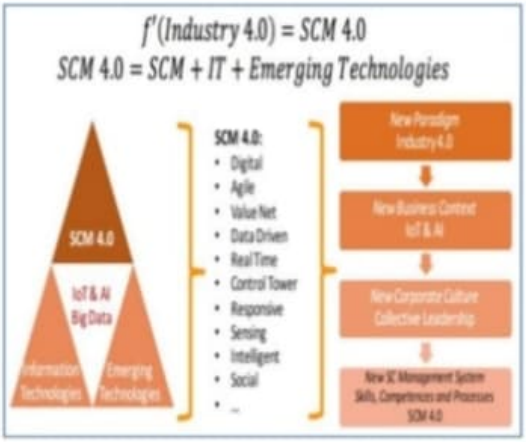

Figure1: SCM 4.0 model [3]

B. Objectives of the Research

To study the SCM 4.0 concept and its stepwise implementation with the pilot study.

Literature Review

SCM 4.0 Step by Step Implementation Process

The Supply chain efficiency can be increased by

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up-gradation with new technology and eliminating the waste in the process. Following figure2 explains the step by step SCM 4.0 implementation process to achieve the SCM 4.0 application benefits like global inventory and lead time reduction with the help of digitized material planning, order fulfilment, and forecast accuracy. It also explains the SCM 4.0 implementation model starting from data cloud SIOP in the current state to the digital value network in the final state.

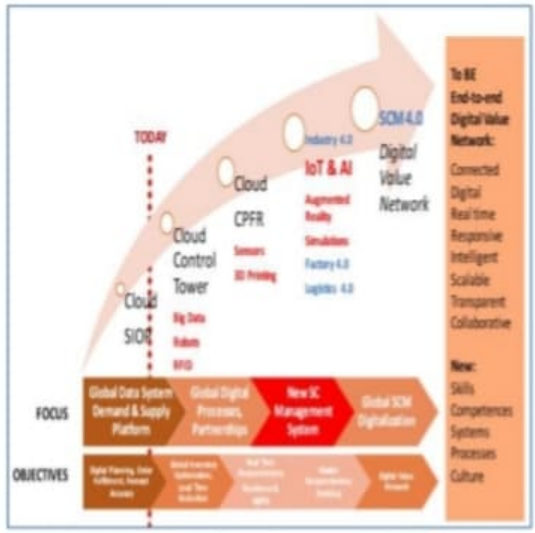

Figure 2: SCM 4.0 Implementation Model [3]

We further break the SCM 4.0 implementation process into an organization vision that defines the objectives of the implementation and improvement layers that explain the sequence of the implementation process as below,

A. SCM 4.0 Vision

1. Faster process: Forecasts are started to carry out on a weekly basis and for the high runner products daily basis. Amazon patent of "Predictive shipping" means products are dispatched before the order is placed by the customer. The order is matched later that dispatched product and the shipment is sent to the customer who ordered that product which reduces the lead time of the delivery process drastically.
2. Flexible: Real-time production planning helps by reducing the planning frequency and frozen period, a quick reaction to dynamic demand. The supply chain may be hired as a by-usage basis paid service instead in-house. The service provider's specialization helps them to generate scale economies as well as outsourcing business.
3. Granular: Customized product demand is increasing rapidly. Micro-segmentation ideas will be able to execute these demands. Customers are managed in granular clusters and within scope of his requirement of the products. Drone delivery helps the business to execute the last high-value products very efficiently.
4. Accurate: The upgraded performance management process allows real-time data of main KPIs like service level, granular data of process parameters such as the truck's location. Clean-sheet models are used in digital performance management systems for setting automatic targets, identifying problems, and mitigating them [4].
5. Efficient: Efficiency in the supply chain is raised by automation of the material handling by robots at the warehouse. Autonomous trucks usage idea application for cross-company logistics [1].
6. Digitization of the supply chain: The supply chain digitization needs capability and internal environment. It means we required integration of the supply chain process with IT with rigid infrastructure with the skilled executives to drive this innovation. Figure3 explains the supply chain digitization process.

Figure 3: The Supply Chain Digitization [3]

B. SCM 4.0 Improvement Levers

SCM 4.0 will influence all the areas of supply chain management. We structured the key six value enablers as improvement levers that will generate a change in capital cost, manufacturing agility, and service as below [1],

a. Planning: The big data, upgraded analytics, and knowledge work automation are going to drive future SCM. The block chain collects and shares the big data within the supply chain recently [5]. It is a shared ledger management of the data which gives facility of having same data at different stations for usage of the many departments [6]. The Data will be either with an open access or with controlled logins to enter in the network. The data contain information like product mix, lead time of individual products, and allocate this as a block within a continuous block chain which is linking to the same continuous transaction [7]. Predictive data analytics study's many internal

and external issues like weather, sensor data, and current social trends that affect the demand planning with machine learning approaches to fix a precise and granular plan. These technologies are preventing errors in demand forecasting by 30 to 40 percent. Also, this latest mathematics gives the probability of the demand forecast quantity rather than a single number. Completely automated closed-loop demand and supply planning convert planning function into a continuous and flexible process. Closed-loop planning helps to integrate pricing and planning that depends on the stock inventory's, probable demand, and replenishment capability, where prices can be adapted as per changing demand to raise the profit and reduce the inventories.

b. Physical flow: The logistic function is going to upgrade with good connectivity, upgraded data analytics, 3D printing, and better automation. 3-D printing improves inventory control strategies and autonomous vehicles improve productivity in the warehouses. The smart machines with features like voice, touch, and graph driven interfaces give user experience. This helps the warehouse linkage with the production loading work stations with no manual interference. Smart vehicles reduce the operating cost of product handling and lead times reduction.

c. Performance management: The real-time data from internal and external sources drive the KPI in performance management. The performance management process is now able to realize the root causes of non-conformances by automatic calibration or by data collection, big data analyses, and machine learning. The machine will start counteractions automatically based on the root-cause identified, such as triggering a replenishment order or changing safety stocks.

d. Order management: No-touch processing and actual-time proactive planning are the two main types in order management that help to reduce costs by work automation. No-touch processing is the further step to an available-to-promise (ATP) with pre-available master data. Real-time planning makes the supply chain structure up to date and driving to dependable planning data.

e. Collaboration: Supply chain clouds are data centers for vendors, companies, and customer providing an integrated planning option with collaboration. This improves the cost invested and errors involved due to communications by 25 percent on overall logistic efficiency [8]."

f. Supply chain strategy: The micro-segmentation of the supply chain based on customer needs and owns capacity formed in an ever-changing and big data drive customized the supply chain to optimize inventory.

Methodology

A. Pilot Study on SCM 4.0 Implementation

1. Current end to end value stream mapping: We started with the mapping of current end to end value stream map to capture total lead time of the product delivery to the customer from the time he ordered the goods as explained in the Figure 4.

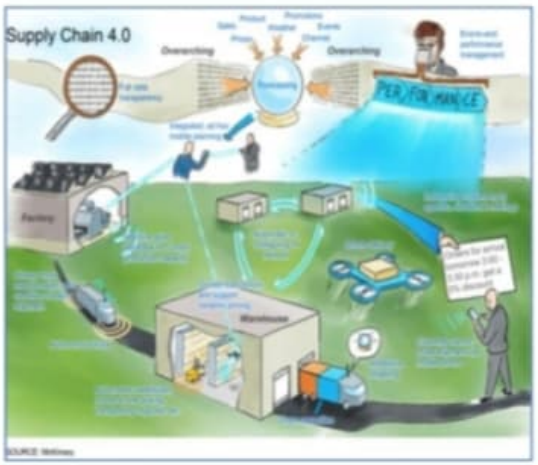

Figure 4: Current Value Stream Map Example [1]

2. Identify the waste: We identified the following main types of digital waste in the value stream,
   a. Data capturing and control: Data collection is paper-based and not regularly updated e.g., vendor lead time master data is entered one time and does not change for years. Also, warehousing receives notifications of the advance shipping but hardly uses this data to control the inbound logistics.
   b. Integrated process optimization: Many organizations have initiated to deploy an integrated process of material planning, but many times data of statistical forecast is overwritten manually by respective planners which have a significantly bad impact on the accuracy of the forecasting.
   c. Physical process execution: Current SCM is many a time executed based on planners gut feeling, but not supported with the real-time data, e.g., to standardize milk run paths in the warehouse. Also, the warehouse is working in one to two hours batch sizes, but not executes the new real-time orders and continuously changing routings.
   d. Low service level or sales: Low service level is due to high lead times, wrong

product stocks, and an unreliable products delivery.

e. Supply chain costs: Logistic, storage, and the network setup cost can be reduced by up to 30 percent by deploying clean sheet advance calculations with minimum touch locations and travel distance. The remaining cost saving can be achieved by supporting dynamic routing approach, transport offloading, autonomous vehicles, and 3D printing.
f. Supply chain planning: Advanced system automates the 80 to 90 percent of planning tasks with good quality. The S&OP will be executed with weekly frequency and real-time that will drive the system automatically rather than planner manual intervention.
g. Inventory: The safety stock is maintained in the current system. The other main inventory driving mechanism is the raw material replenishment lead time. Also, high transport lead time, e.g., from the USA to Asia.
h. Logistic: We need a smart vehicle with container which is capable to know material content details inside it and its current location and past history. This will improve the traceability of the material within short lead time [9].

C. Some Problems for SCM 4.0 Deployment

We find out some problems for SCM 4.0 deployment while studying the concept as mentioned below,

a. Training needs and skilled talent: SCM 4.0 application and sustenance require skilled talent and training to all the stakeholders.
b. Senior leadership involvement: Senior leadership involvement required from start to end for budget approval, decision making, and follow up over timeline of the project.
c. Change management: The change from manual to automated activity requires good change management that covers shop floor training, timely completion of allocated tasks, and sustenance.
d. Small and medium business needs: Small and medium businesses may adapt with tailor-made SCM 4.0 as per their requirement.
e. Visualization of integrated actual and digital supply chain value stream and identifying precise waste is difficult and skillful work [10].

Conclusion

SCM 4.0 model is the integration of IoT, AI, and big data analytics by deploying sensors, networks, automation, and data analysis tools in every process for improvement in consumer satisfaction. The Supply chain efficiency can be increased by up-gradation with new technology and eliminating the waste in the process. SCM 4.0 results in a faster, granular, precise, flexible, efficient, and digitized process. The key six value SCM 4.0 enablers as improvement levers that will generate a change in capital cost, manufacturing agility, and service are planning, physical flow, performance management, order management, collaboration, and strategy. Further, Pilot study on SCM 4.0 implementation with current state mapping of value chain identified the wastage like manual data capturing, manual planning based on gut filling, low service levels, and high inventory that can be prevented or eliminated by the effective SCM 4.0 application. SCM 4.0 deployment also face some problems like training needs and skilled talent, senior leadership involvement, change management, and small and medium business needs tailor-made solutions.

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Government Policies for Entrepreneurial opportunities in the Hospitality industry.

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Abstract

Every startup has its own unique challenge, with every challenge being met by a government policy. Within this post, scientists address the top 5 obstacles for startups and government policies.

Since the announcement of the ambitious Startup India strategy, India has seen an unparalleled growth of new ideas , innovations and new start-ups. Although the general masses see a growth path, 90% of the start-ups fail in the first 5 years, according to Forbes' report.

Some of the most promising start-ups and entrepreneurs have not been stopped. Although they often have the requisite domain awareness, a market outlook, an eagerness to become an entrepreneur and technological know-how, they still either struggle to find an environment that is survivable or they can not understand the policies and strategies to help them.

1. Introduction

I. The SCOPE of ENTREPRENEURSHIP and Indian Affairs

Company successfully implements a part of Economic system dynamics. In addition, the tale

Business is full of mystery in India. Previous Businessmen have been known as a provider of trader funds Traders bound by cast and religious affiliations. Yet, Entrepreneurial value has now become crystal clear. However, the business history began right Civilization of the Indus valley. The third decade about of factors like lack of effectiveness of the 19th century Communication and the continuity of politics and social Negative impact on Indian business. Increasing funding Independence Aboriginal Industry in India, Several programs have been launched for economic development.

Talk to the professional about the current situation The network of technology was also supported by India Countries overseas. An ecosystem since recent years is being developed similarly to that of foreign countries Asia, with fresh and creative outlooks.

GEM (Global Enterprise Monitor) research has been stated that not only the multi-spectrum companies help towards the economy but towards small businesses; The company has the same reputation. Based on the further

results, Early stage presence of 11.98 percent of young people business enterprises and approximately 6,55% of employees Countries are owned entirely by themselves Organization of companies. GEM also says it's really nice few who take risks and launch their businesses Employers are employers around the world and the rest. Evaluation The rate of company departure is relatively high in India. It's been Even said that the world economy has all sorts of entertainment Businessmen. It was examined after a survey of many people that about 6.8% of people manage the property companies and various growth companies Business with the family. India's existing business rate is the latter among the countries of the GEM. Because of this. A stable institutional structure is missing in India, Trust and willingness to bear risks.

II . Entrepreneurial Potential

The lifeblood of every economy is entrepreneurship. Indian entrepreneurs are more concerned with overcoming obstacles, inspiring and overcoming them. Entrepreneurship is one of the key economic growth segments. Innovation is a key factor in an overall change for an entrepreneur by innovation to accelerate social growth. Through world-wide industrialisation, technology became an integral part of a business enterprise, giving them both the ability to pursue their plans or to prepare their businesses central. Corporate Business. Everything now seems to take shape with the internet. Entrepreneurs' future involves an intelligent working strategy and not only hard work plans. High-performance entrepreneurs would inevitably be involved. Evaluation the promotion of an concept is now very simple due to valuable tools such as Web and social media. Marketing is much more easily handled. Entrepreneurship is progressing with the Internet revolution.

The Internet and an accessible device are two valuable possessions that can only turn a brand idea.

Life is not a bed of roses in the case of an entrepreneur. Many challenges delay, but it's right to say that the first thing a businessman needs to learn is that never before success is achieved.

A History on the ecological discovery

A nation's economic development depends on its economic growth. In addition, industrial development is based on employees' entrepreneurial skills. The principle of entrepreneurship building is a time necessity.

India is increasingly in the global headlines as an up-and - coming economic power. All of this is exacerbated not only in the last three years, but also in

the last half decade, by a massive population and strong growth rates. That is not it, it is even because of the growing capacity of science and technology in India. Between 2015 and 2018, the Indian economy recorded a modest rise of over 8 percent over the last three years. India remains a poor developing country, however. It accounts for just 2 % of global GDP. India is an growing economic force, but it has not yet been quite integrated into the world economy. It has a lot of influence but faces several obstacles at the same time. In accordance with its state of development, the World Economic Forum has organized three forks in all countries in the whole world functioning economies powered by productivity and creativity.

The economies driven by efficiency are the ones that benefit from highly efficient and advanced goods. Have a sound business environment and strong institutions of governance. The economies of innovation take the lead in creating the most advanced and technologically innovative goods. Finally, the powered economies are those that depend on natural resources for their survival. As a developing economy, India is classified as a factor driven by a sustainability economy, while the rest of the countries can be classified as efficiency-oriented economies. But India is now heading towards efficiency-driven economies with scientific and technical progress.

III.HOSPITALITY INDUSTRIES IN INDIA

When we connect business and enterprise industries, t s is generally used in and in the food and drink industries to urism is reported to be one of the top ten sectors in India attracting maximum investment from foreign direct (FDI). FDI). When the hospitality industry is linked to a few years earlier, technology was planned to incorporate new technologies p roducts or service improvisation. In the 21st, however, India has seen a huge increase in this for the century.

Dimension, growth of consumer products or food Tech startups.-Tech startups. This development can only be credited with Digitalisation issued. Companies, for example The latest examples are Swiggy, Uber, food panda.

This hospitality industry area has been reshaped by e-commerce.

Cloud Chefs have recently started to build Cloud Kitchens s erve the clients directly. All this is slowly happening pace and the opening of several doors to the Industry of Food and Drink.

2. Objective of study :

1. To study hospitality industry of Pune region

2. To find out opportunities and challenges in hospitality industry in respect government policies.

3. Literature review

The global food service industry is massive and diverse, hence It is difficult to get reliable data to provide a global overview. The food and drink sector plays a different role in every hotel category. Why the F&B department of a luxury hotel preparation and strategizing is different from that of a budget hotel. The full-service hotel, on the other hand, tends to promote their hotel around a brand hotel while budget hotels pay little or no importance to catering. Conventional hotel-restaurants remain dominant in the mid-market segment, offering F&B services to domestic guests as a value added opportunity (Clarke and Chen 2007).

Several hotels are committed to outsourcing, both in the luxury and budget sectors Operations for food and drink. Because the already developed brand is becoming a safer revenue choice, it will also increase this trend and the hotel will avoid running a restaurant at the expense (Clarke and Chen, 2007). The shortage of food services specialists who are able to drive the market forward, manage the food and beverage business efficiently, and develop effective marketing techniques was recognized as a critical impediment to future development of the hotel catering sector. Approximately GBP 4.1 billion was spent on restaurant food in hotels in India while GBP 27.6 trillion was spent on restaurants in 2005 (Clarke and Chen, 2007). The improved performance of non-room revenue sources like food and beverages and spa and club memberships will likely benefit already existing hotels.

VI. Facilitated by companies in the commercial hosting industry

Hospitality industry experience in many parts of the world has shown that the expected strategy for improving the service sector in a long-term way will deliver results without any major problems and retain a degree of satisfaction on the respective market. The hospitality, however, t he Indian sector is facing challenges in three areas: Economic, Human Resources and Growth. Consequently , this study is aimed at studying each region.

ISSUES RELATED TO FINANCE

Hotel managers often face a situation in which the cash available to fund investment in productive assets is not adequate. Hotel investment requires a fairly large initial cost of cash. However, the cash return on the investment continues to be distributed throughout the future for several years. Depending on the size of the company, the amount of money needed to investment capital. There must be a variety of investments.

Usually, funds or capital issues occur mainly when the business is extended or when the budget exceeds. Each of these must be kept at the highest point so that the reputation as a luxury chain is preserved. When it comes to India, funding agencies and formalities in comparison to advanced economies

are extremely complex and there is less time and higher interest rates on loans. This forces the owner, instead of paying them from hotel revenues, to invest more to repay debts. The hotel sector is projected to sustain strong growth of 5-6% throughout 2018, with strong post rescission gains appearing to cool off, establishing a record $170 billion in gross bills. While there are continued positive signs, some local markets faced obstacles in 2018. The hotel's dealings with mergers and acquisitions collected in 2018 were diagnosed with the sales of many premium hotel properties. Private capital was heavily invested in 2017. The hospitality industry has become a profitable company over the past 5 to 6 years and not simply a risky high investment market. In addition, digital innovations such as Trivago and Stayzilla are now gaining much more attention than ever, and analysts also expect that this is going to be a area of high investment in the future. In general, hoteliers will rely on creativity to ensure that the demand stays captured. The emerging economies are grappling with the economic and geopolitical challenges that affect the hospitality industry. Most companies in India have been set up using private equities money. The pattern of a large initial cash expenditure and a retarded cash return by depleting both internal and external sources of funds undermines a company's capacity to make further investments. One solution accepted for a shortage is to limit investment to a level which can be funded through the funds available.

The rationing of capital is one step that the company will take to manage a restricted supply of financial resources.

FOR Emergence OF THE Elimination.

The hotel industry has always evolved and is not by nature challenging, but because of the time needed. With time leading to innovation , new concepts have developed into the market. The fact that India is a difficult country to start a business is well known among local and international investors because of licensing concerns. The current regulatory climate in the country makes the construction of hotels difficult for owners. Archaic laws differ from state to state when it comes to the acquisition of land. India is rising rapidly

Hosting industry shares relations with a number of sectors, including transportation, entertainment, etc. Country for the tourism sector and infrastructure development. And this industry can be a business for you major contributor. Major contributions. It even requires the government institutions to provide a large amount of support. In order to stimulate growth in the sector, government support to reduce taxes and incentives is also important. Hospitality The India hospitality industry is a high-tax industry and this affects the industry's growth. The available land for the growth of the hotel industry is the ultimate prerequisite. True, the best suits or the hotel is usually the best and probably the most expensive suite in the area. The contractor often reduces the idea that capital should be mobilized to build a hotel.

Because, particularly in the small and medium sectors, the magnitude of the capital needed to build hotels is strong. Housing unit investments are primarily land and building investments. The absence of land becomes a major sector of capital. High land costs, renovation and higher taxes have made building affordable hotels very difficult for businesses. There are many considerations, including inventory requirements, that we have to take into account alongside the construction costs. The contribution made by the industry has a direct impact on GDP and the government also claims that the hospitality sector does not affect the societal socio-economic growth.

4. Discussion

The 5 most helpful policies and plans of the government that can help your startup grow:

1) Schemes of financial aid

The biggest task is to raise money for any start-up. The Ministry of Micro , Small and Medium Enterprises has launched several schemes to make it easier for funding to go to you. Here are some of the systems you can use:

Employment Generation Program for Prime Minister

The government merged the two and introduced, in partnership with the Khadi-and-Village Industry Committee, the Prime Minister of Employment Generation Program to ensure job opportunities for urban and rural areas can be created, thus enabling independent employers to start up with the success of the Prime Minister, Rojgar Yojna (PMRY) and REGP. The scheme offers the establishment of a project at subsidized costs and funds for a manufacturing unit up to 25 Lakhs and the set-up of a service unit up to 10 Lakhs.

Same entrepreneur also may avail and go ahead with small financial help in his/her business.

Scheme for Credit Insurance Fund

Start-ups are also seen as high-risk lending regions, so banks are also wary about loans to them. This leads to the major problems facing most start-ups, even if they have been heavily funded or autonomous – the lack of time-consuming and adequate loans. When you do, you face problems when you get the best credit rate.

The policy makes term loans and work capital facilities available for Rs . 100 per unit of borrowing easier. The best part of the program is that these loans are provided to micro and small enterprises without any collateral or third party guarantees.

Such policies are the multiplyer grants program, the Credit Guarantee programme, the Bank Credit Facilitation Program, the Stand Up India, the Sustainable Finance Programme, SMILE, and the Startup Assistance Scheme. Apart from these policies, there are many other policies available.

2) Scheme for research and development

The next area in which startups battle is research and development after they collect the due funds. An innovation or technology startup must invest heavily in research and development. Innovation or technology. The artificial intelligence business can not survive without the R&D team. While most startups conduct enormous research before launching a product, they simply concentrate on the product after its launch and ultimately lose relevance. The government has launched the following schemes to save entrepreneurs:

Promoting individual, start-up and middle class innovations (PRISM)
In order to help individual innovators with different financial grants, this policy is initiated by the science and industrial research department. This scheme provides the innovators with funds that are central to processing and monitoring agencies, including SIIC and IITK. Innovators are directly involved. In the previous schemes the SIIC was known to facilitate the financial support of more than 17 innovators by 1 crore. PRISM allows the production of inventions to be given a maximum Rs.50 Lakh under a further scheme.

3) Software enhancement schemes

In addition to R&D, startups struggle the most to remain on an international level. It doesn't work out in the longer term. The technology they began becomes outdated or depreciates productivity. Such schemes will, however, enable you to cross this low:

This scheme by MSME is a boon for your new business, designed to improve your business and meet global standards. The aim of this scheme is to provide loans at reasonable rates to upgrade the technology. The scheme not only grants up to 15% of the money, it also provides for loans of up to 1 Crore.

Ironically, a range of policies are designed to help you in upgrading technology. Many of them are developed and planned to ensure entrepreneurs are not hindered by technology, such as a technical development plan, an infrastructure development scheme, Atal Incubation Centres, etc.

4) Security mechanisms for intellectual property

India leaves absolutely no room to make any impact on technical development in the international plenary. In our past, however, different countries have always claimed rights over our innovations in the Alfresco area.

What if you did this? You have created a technology of world class and some Chinese firms have introduced a similar product before you were able to license it? What are you going to do? Protection of intellectual property (IP) is an environment that you will take highly care of. Use, read or take a course online. It's about you. It's about you. When the Government understands the value of IP security, the safest way to ensure history does not repeat itself through such policies is to first attempt to do so:

This scheme, which is to allow start-ups to receive international patent protection support and promote innovation has been launched by the ministry of electronics and information technology. In addition to taking the opportunity in the IT industry, this attempt is to assess the value and potential of global intellectual property. This scheme is implemented in two phases by the government:

5) Advertisement Strategy

Often undetected, marketing is one of a startup's biggest challenges. While most businesses think that sales are a challenge and will thrive if the market is stable, what is most unrealized is that without promotion sales are not possible. They usually do not obtain funds to support vertical marketing even though they do. To address this obstacle, the government has established the following policy:

Financial support scheme to support the marketing
The objective of this scheme is to facilitate the formation of a consortium of MSMEs to market their goods and services in a specific system designed to provide institutional support for micro, small and medium-sized enterprises. The scheme is designed by the National Small Industry Corporation(NSIC), to increase the competitiveness and marketability of its products. In addition to providing airfare assistance, the program also provides 20 % of the total qualifying subsidy in ads, ads and theme pabellon up to up to 20 Lakh, according to the rates of the leasing, transport and shipping fees.

5. Conclusion
We can conclude from the discussion above that the hospitality industry is growing rapidly, but at the same time facing problems. Particularly the

Maharashtra state, which has huge potential for the hospitality sector, again Pune district which have big size of industrial zone viz, Pune, Pimpari-Chichwad, Chakan, Talegaon, Rajangaon, Shrikapur and nearer places, faces such problems because of the geography and negligence of the government. As Pune city have IT hub. So many employees from IT industries are moving in India as well as outside India. Its shows that there is tremendous scope of hospitality industry development. If the condition make important steps in this direction such as better accessibility, promotional initiatives, low taxes, etc., and then improve the conditions, leading to an increase in the tourism population in the area of Pune (tourism places like Theur, Rajangaon etc), which in turn increases the number of hotels and also improves the quality of the hotel services. The younger generation, who want to be hospitality entrepreneur, doesn't have much trouble running their company.

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Emerging Entrepreneurial Opportunities in Hospitality Service Sector

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Abstract

The travel industry is a blasting industry in India. With the quantity of local and universal travellers rising each year, this is one hot division business visionaries must concentrate on. India can possibly turn into a favoured vacationer goal internationally. India with its different culture and rich legacy has a great deal to offer to outside sightseers. Its plentiful characteristic assets and biodiversity gives various vacation spots for example snow secured mountains, desert, timberland and natural life, ocean, people life, cooking styles, customs, outfits, dialects , move – music, verifiable landmarks locales, handiworks, and so forth. India has everything visitors are searching for. Subsequently, somebody has appropriately said… Incredible India ! In financial aspects and trade , a business person is a monetary pioneer who has the capacity to perceive open doors for the fruitful presentation of new items ,new systems ,and new wellsprings of supply ,and to collect the vital plant and hardware, the board and work power ,and sort out them into a running concern .Whatever the monetary and political arrangement of a nation ,enterprise is fundamental for financial advancement . There is absolutely no fix recipe to turn into a fruitful business visionary. Some may succeed and make great benefits, others sink en route. Which are the most rewarding divisions for business people? The travel industry is one of them where imminent innovative open doors business visionaries can discover for example travel and visit, lodgings. In spite of the fact that this area isn't efficient in India subsequently need consideration. The reality remains that there are openings accessible wherever in and around us. What is really required is to have the focal points to see and perceive the equivalent. There exist countless business openings in nature for releasing by the business visionaries.

Keywords: Tourism, Hospitality sector. Entrepreneurship, Opportunities

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Introduction

The hospitality and tourism is a shooting industry in India. With the amount of private and all inclusive guests rising every year, this is one hot region business visionaries must focus on. India can transform into a supported voyager objective all around. India with its different culture and rich heritage has a lot to offer to outside explorers. Its bounteous ordinary resources and biodiversity gives different get-away spots for instance snow made sure about mountains, desert, forest and untamed life, sea, society life, cooking styles, customs, outfits, vernaculars , move – music, legitimate tourist spots goals, made works, etc. India has everything guests are scanning for. Right now, appropriately said… Incredible India ! India holds an unprecedented spot in the worldwide universe of warmth. Socially the country may very well be the most different spot on earth. It is a particular kaleidoscope of scenes, great recorded regions and lofty urban networks, foggy mountain pulls back, clear people, rich social orders, and festivities. Rich and down and out, hot and nippy, wild and quiet, old and current - India's breaking points every so often disregard to leave a suffering impression. The warmth business is portrayed as "has offering organizations to guests", which fuses social occasion, preoccupation, and various organizations for pilgrims and vacationers.

Settlement is a long running custom in India. From the incomparable Himalayas and the unmistakable deserts of Rajasthan, over dazzling coastlines and extravagant tropical timberlands, to unadulterated towns and clamouring urban networks, India offers unique open entryways for every individual tendency. In any case, until sensibly starting late this was not so much clear when looking warmth industry. At this point, convenience alternatives all through India have gotten very differing, from comfortable home stays and innate hovels to dazzling legacy houses and maharaja castles. From Kashmir to Kanyakumari , from Gujarat to Assam, there are various societies, dialects, ways of life, and foods.

This combination is continuously reflected by the various kinds of comfort open in India, going from the straightforwardness of close by guest houses and government lodges to the sumptuous indulgence of majestic regal living arrangements and five star extravagant **LUXURY HOTELS** suites. From beach **SHACKS**along Goa's lightening coastlines to British commonplace houses in the various wonderful slant stations, the neighbourliness business in India sells "phenomenal experiences".

As the experiences sought 3 by travelers around the world diversify, the global hospitality industry is adjusting accordingly in order to satisfy these complex

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demands. India is no exception here – quite the contrary. Coming from a rather old-fashioned understanding of hospitality services, India is rapidly catching up and turning into an innovation leader on several key fronts .

In budgetary angles and exchange , a representative is a fiscal pioneer who has the ability to see open entryways for the successful introduction of new products ,new frameworks ,and new wellsprings of supply ,and to gather the crucial plant and rigging, the administrators and work force ,and sort out them into a running concern .Whatever the money related and political course of action of a country ,venture is principal for monetary improvement . There is without a doubt no fix condition to transform into a compelling agent. Some may succeed and make extraordinary advantages, others sink on the way. Which are the most advantageous zones for business visionaries?

Some may succeed and make good profits, others sink along the way. Which are the most lucrative sectors for entrepreneurs? Tourism is one of them where prospective entrepreneurial opportunities entrepreneurs can find out e.g. travel and tour, hotels. Although this sector is not well organized in India hence need attention. India lacks trained professionals in the tourism and hospitality sectors. Any business in this sector will thrive in the long run as the demand continues to grow every year. If we see the previous years‟ fact and figures of tourism industry – tourist flow Foreign tourist arrivals during January-March 2015 were 15.63 lakh with a growth rate of 12.8 percent, compared to 13.86 lakh during the first three months of year 2014.

- Tourism in India accounts for 6.8 percent of GDP and is the third largest foreign exchange expert.
- The tourism industry and the neighborhood are fast approaching GDP completing US $ 44.2 billion by 2015
- Over 2006-15, direct liability is subject to a CAGR of 10.5 percent.
- Rapid development and business growth in GDP is expected to be 7.2 percent annually to US $ 88.6 billion (2.5 percent of GDP) by 2025
- More than 7.757 million nominated guests are represented in 2015
- The emergence of foreign explorers expanded at a CAGR of 7.1 percent in 2005-15
- By 2025, outdoor tourism is projected to increase 15.3 million, according to the World Tourism Organization.

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II. The purpose of the study

1. Studying literature reviews in the field of hospitality business
2. Find opportunities in the hospitality sector

III. Literature review

India's development and housing industry is one of the leading sectors among the allied organizations in India. . The third-biggest sub-portion of the administrations area containing exchange, fix administrations, lodgings and eateries contributed almost US$ 187.9 billion or 12.5 percent to the Gross Domestic Product (GDP) in 2014-15, while becoming the quickest at 11.7 percent Compound Annual Growth Rate (CAGR) over the period 2011-12 to 2014-15.

The development business in India has the good value of thinking about the rich social and physical heritage, setting, status and spaces of the trademark that are spread across the country. The travel industry is 5 additionally a possibly huge business generator other than being a noteworthy wellspring of remote trade for the nation.

- Foreigners (FTAs) rates have been reliable for the most recent three years generating approximately $ 4.48 million during January-July 2015. Excluding trade payments (FEEs) from development business up to 2 percent. , US January-July 2015 when shows were compared with 1.9 percent when gander was taken during the 2013 season. Cases during the July 2015 period amounted to Rs 11,452 crore (US $ 1.74 billion) when they were shown to be in line with FEEs of Rs 10,336 crore (US $ 1.57 billion) in July a year back.
- Foreign Direct Investment (FEEs) between January-July 2015 amounted to US $ 11.41 billion which seems to be roughly the same as $ 11.06 billion for each period last year.

The rate of development of conditional FEEs in January-July 2015 was 6.9 percent of the development and neighborhood business segment is among the 15 priority areas in India to pull the most important function without the Direct Directorate (FDI). During the period April 2000-May 2015, the framework came in at around $ 840 billion (FDI), as shown by data released by the Department of Policy and Promotion (DIPP) .By continuing the average visitor rate and seeing India's potential, various organizations put resources into the development business and the neighborhood.

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A touch of emerging interests right now:

- Luxury hotel chain Marriott International will expand its India presence by adding over 50 hotels in the next three-four years, according to a senior official of the group.
- The global hotel chain, which operates in the 'leasing and franchising' model, has 116 hotels and over 32,000 rooms in India. It has 15 brands such as Ritz-Carlton, JW Marriott, Renaissance Hotels, Courtyard, Fairfield and Le Meridien, each catering to a different customer segment. Marriott has been on expansion mode the last few years. The group added 18 hotels in calendar 2018 and for 2019, plans to add 22 hotels including in Tier 2/3 cities.
- Noting that 30 per cent of the group's India expansion is through the 'conversion and rebranding' route, Smith said setting up a new hotel has challenges of high cost of land and capital, besides a cumbersome permit process.

- Thai company Onyx Hospitality and Kingbridge India Hotel set joint venture (JV) to open seven locations in the country in 2018 when the JV will raise US $ 100 million.
- The ITC hopes to invest around Rs 9,000 crore (US $ 1.42 billion) over the next three to four years to upgrade its housing portfolio to 150 hotels. The ITC will send five specific hotels - Mahabalipuram, Kolkata, Ahmedabad, Hyderabad and Colombo - in 2018.

- Goldman Sachs, New-York has taken away all the supposed bank savings, contributing to Rs 255 crore (US $ 40.37 million) in Vatika Hotels.

- Japanese developer SoftBank will earn Rs 630 crore (US $ 95.6 million) in cash around rooms at Gurgaon based OYO Rooms.

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- Make My Journey you will find the Mygola theme page and its undisclosed amount of focus, and together you will need to focus on improving the mass mobility online.

- The Indian government understands the potential of the country in the development business and understands how to make the country India more focused on business development. The basic exercises taken by the Government of India to provide assistance to the business of development and the diversification of India are shown by:

- The Indian government has said to cover 150 countries under the e-visa structure earlier this year in addition to opening an air base in the NCR area to help weight the Delhi airport.
- The Tourist Visa on Arrival (TVoA) scheme associated with Electronic Travel Authorization (ETA), enforced by the Government of India on November 27, 2014 in 43 countries has made significant progress in the workplace. During the bulk of the month of July, in 2015 a total of 21,476 tourists emerged from e-Tourist Visa while up from 2,462 during the July, 2014 period saw an increase of 772.3 percent. During the month of January-July, 2015 1,47,690 E-Tourist Visa visas emerged while from 14,415 in January-July, 2014 opting for 924.6 percent progress.

- The Indian government has set aside Rs 500 crore (US $ 79.17 million) for a significant period of National Heritage City Development and Augmentation Yojana (HRIDAY). The 12 most important urban centers are Varanasi, Amritsar, Ajmer, Mathura, Gaya, Kanchipuram, Vellankani, Badami, Amaravati, Warangal, Puri and Dwarka.

- Under the us Project Mausam of the Government of India proposed to consolidate multilateral communications and restore vital maritime and financial relations with 39 countries in the Indian Ocean.

IV. Research Methodology

- To increase a more profound comprehension of the advancement of enterprise inquire about in hospitality & tourism, a precise audit technique (Lai et al., 2018; Marasco et al., 2018; Weed, 2006) was utilized right now.

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- Methodical audit has been broadly utilized as a technique for blend in different fields, including H &T (Ip et al., 2011), to assess the degree and nature of information in a explicit field and guarantee that compromise and translation are based on the "best proof" (White and Schmidt, 2005).
- We broke down diary articles appropriate to business enterprise in the hospitality & tourism setting to acquire a thorough and delegate review of business enterprise look into in hospitality & tourism.

V. Discussion

India's growth and development business has made great strides in various frameworks, for example, the medical development business, the sports / experience development business, the untitled lifestyle and the usual development business and so on. The medical development business in India is expected to reach US $ 3.9 billion this year, a 27 per cent increase in CAGR over the past three years, according to a joint statement by FICI and KPMG. Basically, medical visitor arrivals are expected to exceed 320 million by 2015 and 85 million every 2012. The development business is similar to predicting the expansion of the e-visa conspiracy, which relies on the arrival of Explorer to India. Estimated Link ICRA Ltd will increase the wage growth of the Indian textile industry by 9-11 per cent in 2015-16. India is projected to be the fastest growing country in five years, as seen in a review by SRI International, expanding by more than 20 per cent every year to 2017.

Currently, the development business has created the largest non-smoking and fast-paced industry on the planet because of its unlimited authorizations and potential outcomes. In the long run, this represents about 8% of the global exchange and 20% of the planet. The certifications show that different countries have progressed from reverse to creation, usually due to growth business progress.

For example, growth businesses add more than 70% of the national pay to a fraction of countries such as Malaysia and Singapore. In any case, India's national pay plan is still underestimated at 2.5% .India accounts for about 15% of the world's hardest and fastest people, with only 0.40% of development and business growth on the planet. However, the predictive image of the Indian development business is certainly not the

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immediate consequence of overlooking the development business potential, yet it contributes to the release of the vast development business potential. In all honesty, India is a fortune for further development business progress. It contains long, unknown sea shores of incredible sand and affects coconut trees; From intricately taking you to the bone-chilling slopes of an unusual mountain stream like the Himalayas that spread images of curious, long-term architecture; Records of monster-level curiosity and ambitions, love, and treachery, as if roughly disguised in their chests from wandering around in astonishing chats; Untitled Living Refuge and Sea Universe, and Shopping Celebrations. Some idea of the vacationer's idea and intrigue is exposed as a matter of non-justification. Seeing India's tremendous growth business potential, the World Tourism and Tourism Council (WDTC) has predicted: "India could become the number one guest destination on Earth by earning 10.1% per annum." When looking at these realities and statistics reports, you should look at the top tier fantasy open entries in the neighbourhood.

First of all we have to respect the opportunity of a massive business and business visionary audience. Effort is the tendency to plan another business, for example another business provides a thing, structure or link. It proposes people who “try” the risk of new ventures. An attempt is made by a business visionary. The technique of creating a "business venture" is presented. Business endeavour is a method of training by a specialist who continues to filter out a new person, and by pursuing such considerations at a favourable open gateway through risk and lack of effort.

An undertaking is made by a business visionary. The system for creation is given out "business undertaking". Business endeavours is a strategy for activities of a pro who is an individual continually separating for something new and encounters such contemplations into favourable open passages by proceeding through the hazard and weakness with the undertaking. "Business visionary" is gotten from the French action word enterprendre, which decides "to get a handle on", for example the individual who handles to plan, direct and see the risks of a business.

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The entrepreneur perceives another business opportunity and reliably shows affinities in their request and following choice to abuse the chance. He/she is a pioneer or designer who sees and attempts uncommon possibilities; changes over those open gateways into practical/associating with contemplations; joins an awakening power through time , exertion, cash ,or aptitudes ,foresee the risks of the true blue business spot to understand those evaluations; and handles the compensations from those endeavors.

Business undertaking and convenience

In addition, since progress and the advancement business is creating paying little psyche to what you take after at it, a typically expanding number of people are wandering all around and relying on progress and electronic life to find novel experiences to suit their tendencies and their spending limits. A bigger number of adolescents are wandering more than their seniors and embrace of new "sharing" insights with respect to vehicles, homes, meals and anything is possible beginning there. They are normally increasingly adaptable with their itinerary items and scanning for new encounters and new goals. Not solely do these models open entryways for representatives to make affiliations, targets, or applications to satisfy the necessities or deal with the issues of tenaciously overall customers and dynamic wayfarers, on the off chance that you're thinking about pushing your own business in joy, this level of structure interfaces with you to think past the edges of your own space.

So by what technique may you plan for business in the neighbourliness business?

Business visionaries and consistently energetic ages are framing the fate of the sparkle business. It's essential to get capacity with the points of confinement ought to have been sensible to your most noteworthy bit of leeway. Late discussions have been going on grounds far and wide about whether those aptitudes can be told or if experience is a "point of view." Fostering that spirit and supporting innovative major reasoning cutoff

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points, affiliation and adaptability are the keys to building a strong foundation.

IV. Result

At the present time have a reasonable thought as for business visionary and attempt. Free endeavour is the cash related clarification behind all eager action. It construes that any individual is allowed to change a thought into a business. The open portals for potential business visionaries are immense .The steadily changing condition gives a predictable development of potential conceivable outcomes if an individual can see a supportive thought in the midst of the tumult that in like way submerges such a territory .Thousands of elective exist since each individual makes and makes contemplations with a stand-apart edge of reference .in every practical sense ,one business visionary is named as an open door searcher who is entranced to recollect for essentially those business structures which are feasible and have an energy for the market .at the same time individual required to select a specific choice from various choices accessible .So he/she should inspect, perceive and pick a sensible business opportunity .It is an engaging undertaking in term of favourable position which persuade the business visionary to put expressly .What are the potential possible results in kind aura section for an agent's endeavour depend upon reality and figure of the development business –

Sr No	**Area**
1	Opening a housing/diners in a spot and plan of thing benefits according to client needs in grandstand, using inventive strategies, keeping up quality measures .
2	Create versatile applications, programming related to visits and travel, hotels and bistros information, advertisement, packs, esteem, organizations offers, enrolment, reservations, etc
3	Occasion the load up, planer, coordination's

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	organizations express.
4	Accommodation consultancy and research.
5	Accommodation guidance
6	Avionics – bearer, contracted flights, ticketing, fuel, land and water transportation, items suppliers , retailers
7	Exhibition corridor, craftsmanship shows, composing, language, library, performing articulations and culture center
8	Banking and cash , law and real organizations help
9	Deals and advancing, business, introduction, brand picture related to the movement business affiliations
10	Media correspondence, news inclusion, reports, content write in print, electronic and modernized area related to convenience .
11	Human administrations ,excellence care items because of clinical the movement business impact in India
12	Agribusiness
13	Condition
14	Science and propels
15	Sports
16	Material, style, inside elaborate topic and plan
17	Designing and building
18	HR improvement

The as of late referenced focuses are related with one another really or by recommendation as we no doubt am careful the development business is umbrella industry and is multi - dimensional .There are a huge amount of activities in these warning places district as the development business is most prominent and speediest making industry of the world. New

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models and considerations are developing also as changing time to time making congeniality part intriguing in a steady test show off economy of a target.

We can get from other beneficial business visionary of India and abroad to give a couple of models from the making outline of ground-breaking authorities, for example, RaiBahadur Mohan Singh Oberoi (maker and head of Oberoi lodgings and resorts), MahashayChuniLal and Dharm Pal(MDH masala(spices)),AjimPremji(Wipro), Narayana Murthy(Infosysis),Munjals(Hero cycles),Tata and Ambani,Bajaj, Khetan, Goenka, Birla, Goderej, KiranMajumdar Shah (Biocon),Shah Nawaz Hussain(Natural/home created helpful brilliance things), Bansal(Flipcart),Bill Gates(Microsoft),Steve Jobs(Apple PCs) ,John Pemberton and Asa Griggs Candler(CocaCola),Larry Page and Sergey Brin (Google - web, and so forth.

VII. Conclusion:

Reality remains that there are openings accessible wherever in and around us. One can work individual or in a joint effort with private and government help. What is really required is to have the focal concentrations to see and see a practically identical assessing individual's qualities, insufficiency, openings and dangers assessment. Reviewing the general point of view for the development business and friendlinessexist multitudinous business openings in the earth for releasing by the specialists.

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An empirical study related to different revenue verticals at Agro tourist center in Western Maharashtra.

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Abstract: -

Agro tourism is a concept for the development and preparation of villagers to create and preserve the heritage and an alternative source of revenue. This type of tourism develops where farming and tourism interact. It comprises various farming activities, rearing animals in a rural environment along with fresh local cuisine. It essentially develops in different parts of the world as a niche tourism. It could be a source of rural development in developing countries such as India. The researchers visited a farmhouse in Maharashtra in order to realize this thing. The villagers are totally dependent on agricultural activities. As agricultural activities are conducted twice or thrice during the entire year, the farm owners have little else to do in the offseason. In accordance with this study, the researcher studied the number of visitors to the village and took advantage of various agricultural, rural and rural activities. The study had paved the way for the young people to protect their immaterial heritage and earn money from their own people. This paper tests, analyzes and presents a plan for farmers and young villagers at their own doorstep as an alternative source of revenue.

Key words: - Agro-Tourism, Rural development, Revenue Verticals, Income sources.

I. Introduction: -

Most developing economies, particularly India, are backbone of agriculture. Green and green revolution Less plot holdings as demonstrated by the Asian countries have led to rapid progress in agriculture in recent years. Despite this, India faces a number of socio-economic challenges, Demographic and institutional sectors affecting their fundamental survival. 85 % of the

population in India are directly or the vast majority of the people are indirectly dependent on agriculture in rural areas. Tourism is a very important sector contributing in country's GDP and is a vital instrument to build jobs, alleviate poverty and reduce welfare Rural sustainability. India is essentially a rural economy, rural tourism and agri-tourism Significant place for development facilitation.

The Indian population is 1.21 billion according to the 2011 census data. This says it's up to 870 Since independence, millions. India is 17.5% of the population of the world, while it is of India 3,287,240 square meters Km i.e. just 2.4% of the world's total surface. The field is being broken up and divided by generation, increasing the number of oppressed farmers and landowners (Report 2005-06 of the Agriculture Census). The existence of agriculture due to globalization and industrialization. It's menacing. In order to maintain their own profits, farmers must find more revenue through employment or businesses.

The 12th five-year plan drawn up by the Commission on Planning highlights 'population tourism' Increase net benefits for the poor and ensure that growth in tourism helps to reduce poverty. The Planning Commission has described tourism as the country's second largest sector Low-skilled employees' workplace prospects.

The use of tourism in agriculture is agritourism. It promotes and links agriculture Tours as a product of tourism. Agri-tourism is a small rural company that includes a farm Element of business tourism. It was practiced in theory since many centuries.

In recent decades, conceptualized. In Europe and North America, this concept was initiated and developed. Then in many countries to spread. It was launched in Malegaon, near Baramati in India in 2005, In India Agri Tourism Development (ATDC) Maharashtra. Maharashtra. The ATDC supports agribusiness hubs as It also addresses farmers' needs by initiating the production of the agritourism concept in India to teach them the skills and technical knowledge necessary to start and administer this project Farms of them.

II. Observatory/Objectives: -

This thesis is an experiment on rural development that is not rich in historical or natural riches. Most farmers have to rely on seasons as an agricultural field. That was the idea.

Or the alternative income, commitment and pride will be created by an idea. The aims of this research are as follows;

1. Establishing or establishing an agri-tourism policy on India's agricultural land.

2. The villagers are to be taught to treat foreigners as their income and pride.

1. Develop a relationship between tour operators and the villagers' youth.

4. Understanding and evaluating agri-tourism 's social economic contribution in a developing economy such as India.

5. Analysis of agricultural tourism as a resource in the agricultural sector for the decline in growth rates.

III. Agricultural introduction

A farm is a form of niche tourism in which farms have been used to serve as tourist destinations for educational and leisure purposes Agro-tourism as "the practice of attracting tourists or tourists." Agro-tourism gives people the opportunity to breathe fresh air, learn the rural environment, riding the horse, pick fruit, feed animals and milk cattle and participated in farm work and purchase produce directly from farms.

Agricultural centers are the place to come and spend your weekends or holidays in a farming-like village at a very economical cost for tourists from urban areas; they are the home away from home that gives a personal feeling of harmony with rural culture. It integrates agriculture with pleasure and provides the tourists with the benefits of farming and tourism, providing farmers and villagers with economic benefits.

IV. The study's rationale

Agritourism is able to rejuvenate conventional tourism concepts and views to bring sustainable development into a new dimension. Rural tourists have become one of the top priorities of the economic agenda for all countries, as stated by Fariborz Aref (2009).

Rural life can always be learned from sources such as food, plants, animals, handicrafts, languages, culture and tradition and rural lifestyles, as urban population that is rooted in villages.

Farmers have the potential to satisfy this portion of the population's interest.

Agri tourism has the ability to create both farmers and tourists a win-win situation.

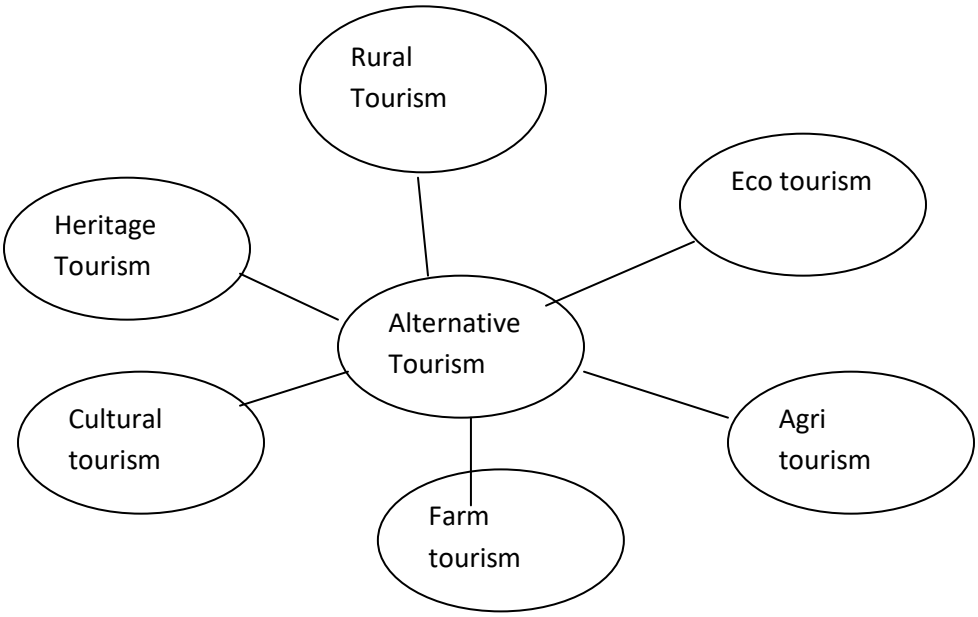
Farmers benefit from additional income sources and the natural environment of tourist famine is satisfactory.

The 'rural tourism' involves a range of activities provided by farmers and farmers in order to bring visitors into their region and generate extra income for their businesses. It encompasses any form of tourism that highlights rural life, art, culture and heritage on rural sites to economically and socially benefit the local community, thereby promoting the connection between tourists and local people. In essence, rural tourism is an activity in the countryside. It has a multitude of facets, including tourism on agriculture, cultural tourism, nature tourism, adventure and ecotourism. Rural tourism is experiential and sparsely populated, mainly in the natural world, combines with seasonal and local occurrences and bases on the preservation of culture, heritage and traditions, and is characteristic of the traditional tourism.

Tourism is an important component of the service sector that largely contributes to Indian economic growth. The tourism industry in India is growing at a rate of 10%, two and a half times higher than the global growth rate. The scope of tourism is very often varied according to the purpose and circumstances of the activity. In India, health tourism (medical tourism), religious tourism, sports tourism, are the only tourism arteries that have become more active, tourism education etc. Agricultural tourism in India is now an additional tourism artery. While it is currently in the developing stages, it can get off the ground with proper government incubation. Not only can the current growth rate be sustained by introducing an agro-tourism concept throughout India, it is also an added value and can accelerate additional growth.

This study introduces the agricultural and tourism concept and discusses the current status of this farming business. The connection between tourism and agriculture has a capacity for both industries to rejuvenate and inject resources. Farmers used agritourism to diversify agricultural products and develop a new market for additional revenues. Farmers' children were also often helped in farming by agri-tourism.

Such centers have also provided villagers with good employment. The figure of temporary workers is more than the number of permanent workers was observed.



Performance and debate

Case 1. Kendra's Mauli Krushi

In 2009, Mr. Janardhan Thopte founded a small village in the Mauli Krushi paryatan Kendra in Chincholi Morachi in Pune district of Maharashtra. Morachi Chincholi or (liberally) by name is called the village of tamarind trees and dancing city of Paon (Marathi: alternatively, Moar). It is 55 km from Pune, near the Ahmednagar highway. It has free Wi-Fi.

There are a lot of peafowls in the village today. This area has dry soil and extremely low precipitation on rocky soils. According to Mr. Thopte, he just finished secondary school. He was forced to follow the revolutionary idea of agri-tourism with unfair agricultural production because of low and irregular precipitation. In 2009, after having passed through many channels and snowboards involved in establishing the Agri Tourism Centre, he set up a private Agri Tourism Center without being bought from a bank called Mauli (Meaning Mother) Krushi Paryatan Kendra on an eight acre of land. In Agri Tourism and agriculture 8 jobs were employed. They work at least eight hours a day on Rs.100-150 wages. According to Mr. Janardhan, the

annual revenues from tourism are Rs. 3,50,000. And expenditure is Rs. 220,000. The total revenues for farming operations are Rs. 1.30.000/- a year, compared to just Rs. 50.000/- a year. Mr. Thopte says 80% of his income comes from Agri Tourism, whereas 20% is a commodity of agriculture.

Mr. Janardhan and the investigator visited the farm during a discussion and said that there is no rain in the area in 8 years and that if there is a rain it is very low. Two open wells are located in his farm, one of which is fully dried and a pool for irrigation. There is also a pond that is run by Govt. Maharashtra, in the sense of and for farmers under the Farm Ponds on Demand system. The pond was constructed on Rs. 82,200 in 2010. The pool size is 30 x 30 x 3 meters, an excellent source of rainy season for collection of water and the use of water for filling the well with pipes.

Shortage of electricity for irrigation purposes. On his farm, an irrigation system is also established to irrigate orchards and vegetables. In the agricultural pond also Gappi fish have been introduced to minimize mosquito growth as these fish are using mosquito-laying eggs.

All of the 8 hectares are grown as mango, custard apple, guava, sweet lime, orange, orange, kagzi and fruits. are also cultivated. All vegetables are grown on the farm and tourists have fresh and on-farm vegan picking and harvesting facilities. Mr. Janardhan, a very innovative farmer, uses organically grown farming techniques to avoid heavy moisture loss in the summer. Mr. Janardhan wanted to prevent losses because one plant does not have a second crop that is a novel idea of advanced harvesting practices. The open spaces of two orchards in this area are often utilized for the cultivation of vegetables for additional income and for weeds cultivation.

Mauli KrushiParyatan is special for one-day visits to the whole city by bullock cart, with pure, ethnically based vegetarian food, cart travel, picnic, a variety of vegetables, medicinal products and uses. They visit Mauli Krushi Paryatan on a regular basis.

Case no 2. Mayur Krushi Kendra Paryatan

In 2012 Mayur Krushi Paryatan Kendra in Village by Mr. Maruti Govind Ukirde, Chincholi Morachi, newly established and in the process of receiving ATDC and MART approvals. This center was built on just nine month old six acres of land, according to Mr. Maruti. For 8 hours every day, the four members of the family participate in both Agri Tourism and farming. The season of Agri Tourism will start in June, and end in February (about 9 months) as the hot summer in the dry regions runs between March and May. According to Mr. Maruti, this is not the season. The main source of income for the family is the tourist operations Rs.1.0, which are already in their infancy and hope that tourists will start to work on approval in ATDC and MART in the future. Tourist activities Rs.1.0. Approximately 500 tourists have been visiting the center since last nine months and there have also been increased visitor numbers and annual tourism incomes, and by selling the farm to ATDC officials, the facility has received 3-5 lakh of revenue from farm activity.

We are helpful with advertising and marketing. Paryatan Kendra cultivates some vegetables as well, such as the grenade, the mango, the sapota, the orange trees and the sweet lime. The conclusion of his daughter's agricultural diploma with all modern practices and Mr. Maruti's vegetable cultivation. The son of Mr. Maruti works for the Indian Army, helping his parents develop this center in the coming years. Tourists will be entitled to pay for the fruits produced in these Centre’s, to take advantage of the newly caught fruit and to excite the harvest as well. In this city center is a well with a drain, a farm pond where all the fruits and vegetables are irrigated. This center helps you to experience nature, rural life, livestock, birds, farming and ethnic food at the lowest rate and to seek to live one or two days in a pure world free of pollutants. Tourists will look forward to watching in this center animals, birds and pavilions. The area is very quiet and ideal for meditation and the hills are also the area's beauty. There are also several birds, goats, buffalos, ducks, rabbits in this center and the backyard. Chulha food is made here with local ingredients like Jowar and the Bajra, along with a small number of curries and chutneys, according to the local way. Visitors will discover the culture and life styles of the villages.

How people express their sorrows and achievements and live. In this middle, home animals are also given for driving Bullock Cart, plucking the field, working with the biogas (gobargas), using homemade fuels, and living in drought conditions in that village by national birds. For this reason even household animals are available. Villagers are aware that pesticides are not used in their field to defend pawns. The center provides many amenities, including recent ethnic food and hospitality needs. Customers like Bullock Cart can enjoy tours and attractions around the farm. Take a look at the pavilions during your feeding period. The food is served in the styles of veg and non-veg dish. Children are going out to activities outdoors like Gotya (marbles) Gilli Danda, Kabaddi, flying kites, etc.

It is early morning and late evening (6 a.m. – 9 p.m. and 5 a.m.–7:30), which is the best time to see peacocks. Pearls occurrence only once a year, peahens lay five-six eggs, and according to Mr. Maruti take 30-32 days for hatches. Only once a year takes top dances and breeds. The absence of rain is often not responsible for keeping eggs safe and wild birds and animals harming their eggs and kids because the population of peacock decreases every day and some of our village is distressed. When I was young, Mr. Maruti said at the oral conversion I found my village lined with gardens of fruit and the forest of tamarind, but because of drought, people lost their garden, livestock and agricultural interests. It hurts me, it harms every citizen in India, and it helps the planet save the climate.

In the case of tourists who are interested in visiting the Centre, the average visitor must pay a fee. Every touristic activity, such as village cart, day / night ride, farm visits and information on cultivating Mango, Guava, Sapota and Pomegranate, payments dependent on fruit, vegetables and flowers picking and harvest, etc. .... Home-made food is available to tourists. The water hanging pond is also one of the sights of this Centre. Rabbits, backyards, love birds, pavilions and ducks are the main attractions of the Centre.

Check out

1. Agricultural tourism center is capable of attracting tourists. Work on embellishment had completed already. The pond needs cleanliness.

2. Agriculture is no other source of profits.

3. They have no unique traditions or cultures, but in nature they are very warm. With full respect and love, you welcome your guest.

4. Older people claimed the heritage temple is 150 years older, but they have no "patta," pillar, or other written manuscript that could prove its value as a heritage.

5. In farming practices they are good.

Recommendation

Agri-tourism spectrum:

1. Cheap means: food, housing, leisure and tourism costs are low, extending the reach of tourism.

2. Urban curiosity about agriculture and the way of life: Agricultural tourism, which includes cities and farming, is capable of satisfying urban curiosity by providing a space for rediscovering diverse rural life.

3. Activities for the family: rural games, festivals, food, dress. Strong activities for recreation.

4. Find consolation in the natural lifestyle: peace and calm is built in agricultural tourism.

5. It's like going back to its roots for tourists. Nostalgia for their farm roots.

6. Agriculture education is an important element of agricultural research, in which urban students move at the pace of technology.

In order to realize the facts, the researcher talked to the famous tour operator. The tour operator will be ready to take tourists to the village for only 4-5 hours after all the tribulations have been overthrew. She urged tourists to visit the town and take some tourists to the village. It was a great challenge for the study.

Work has highlighted that both case studies have actually begun the efforts in this area. The current situation with new policies should be known. We try to emphasize below the existing policies to allow for the additional income of an agri-tourist center and to survive under any conditions.

Several revenueverticals wereidentified by the researcher:

1 Rural tourist resorts hotel business

2 Sales of products such as organic plants, crops, products, dairy products

3 Sale of legally permitted animals.

4.Selling food and drinks in agro-tourist centers', as allowed by law

5 Sports like walking, skirting, recall, Zorbing, Zip line, adventure sports etc.

6 Water sports in tourist centers in Agro

7 Various types of tourist attractions in Agro, such as cart rides for Bullock, horse riding, camel rides, buffalo riding etc.

8 Spa income related activities such as various massage types, beauty treatments, etc.

9 Income from plant sales in the kindergarten

10 Organic honey sales and other farms products.

The additional points are as follows:

Additional income and job generation sources: farmers perform farming-relevant agro-tourism activities:

Restricting migration: farmers migrate in search of work from rural to urban areas. This increases the workload and other facilities on urban areas. Low industrialization makes it very difficult to generate jobs. Farmers must be kept on farms, therefore. Agricultural tourism offers the same solution.

Efficient use of surplus labor: disguised joblessness is found in agriculture. This means that excess workers work in farms and the productivity of these redundant workers is essentially nil. The excess workforce in agriculture is used by agro-tourism.

Direct Market: direct market for arts and crafts, agro-products and village-based goods, which grow in effect a small-scale rural industry.

Efficient use and sustainability of natural resources: the efficient use of natural resources , such as land, water, etc., by agricultural tourism. It is sustainable in nature because it has a low environmental and cultural impact.

Offering women work in rural areas: there are very few opportunities for women in rural areas. Farmers and their family members conduct agro-tourism activities. Various tasks such as cooking, hospitality etc. can be performed by women. It also provides women with jobs.

Rural area growth: the growth of agro-tourism is related to infrastructure development, medical facilities, water supply, etc. Thus the rural area is developed.

Improve people's standard of living: it increases not only incomes, but also makes the farmers contact urban people (visitors) and affects a way of life and thinking that enhances rural population living standards.

Conclusion

Although these precautions clearly include the conclusions drawn from the case study , the research demonstrates how subsidiary income production can be considered a single one. This allows us to provide insights into this environment that might be useful for others in considerable ambiguity to exploit opportunities. In each case it is possible to buy fresh produce, fruit and flowers, and tourists will also be able to enjoy collecting all kinds of products on the farm simultaneously. Tourists will also be informed on the various crops on cultivation practices in these Centre's. Tourists will be involved in a range of activities, including carts and tractor rides to enjoy domestic animals, games in rural areas and folk dances. Water harvesting of agricultural ponds, a local tree plantation and several facilities provided for tourists by these Centre's. Similar studies were also carried out by Gopal, Varma and Gopinathan (2008). A similar analysis was also performed by Hamilpurkar (2012).

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A Research Study on the ERP System Implementation and Current Trends in ERP

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Abstract

The ERP archive found from long back years may be in 1970, and it had been initiated with the aim of business processes integration. The Gartner Group coined the name ERP, and it had implemented at the start of the year 1990. Software firms such as SAP had initiated to deploy ERP at the start of the 1990s. SAP further delivered the R/3 version in the year 1992. The SAP R/3 had been equipped with the addition of customer-server hardware construction to work on many stages at a time. The year 2000 had seen the solution over the problem of Y2K by all major ERP software system providers. Over the last 10 years, the ERP software market has to spread immensely with service providers are catering business-wide application with a complete range of application and functions.

This paper tried to study the detailed ERP system implementation process and current trends in ERP software. Further, we found out some problems or gaps in an ERP system application process and tried to answer it with proposed solutions.

We conclude this study as "an ERP system integrates all the functions in an organization like finance, marketing, manufacturing, and human resource with an advance real-time data collection, processing, and communication with very fast speed and allowing the organization for a quick decision on the real-time issues to control the complete business process day today."

Keywords: ERP Implementation, Data-Cloud, 3D-Printing, Digital Marketing and AI.

Introduction

The ERP archive found from long back years may be in 1970, and it had been initiated with the aim of business processes integration (Sheilds and Mureell G., 2005). The Gartner Group coined the name ERP, and it had implemented at the start of the year 1990 (Chang, SI et al., 2000) (InfoWorld and Heather Harreld, August 27, 2001). Software firms such as SAP had initiated to deploy ERP at the start of the 1990s (Robert Jacobs, 2007). SAP further delivered the R/3 version in the year 1992. The SAP R/3 had been equipped with the addition of customer-server hardware construction to work on many stages at a time. The year 2000 had seen the solution over the problem of Y2K by all major ERP software system providers. Over the last 10 years, the ERP software market has to spread immensely with service providers are catering business-wide application with a complete range of application and functions.

In the next 10 years, business patterns will change by change in the ERP pricing structure, application methods, and adjustments to a vertical market. Many data are storing cloud application models. For example SaaS is seeking the attention of companies. The ERP pricing model of payment as per usage is largely adopted by the business firms trying to change huge capital cost with a month on month subscription (Deskera, 2020).

Definition

ERP: The ERP's full form is enterprise resource planning. ERP is informing the data collected from many sub-sources into a single system (Oracle, 2020). For example, a business firm has three main data centers, namely human resources, finance, and manufacturing, where ERP adds all three sub-sources into a single system that presents data with all sub-sources (Almajali and Dmaithan, 2016).

ERP Implementation: It is the process of checking the current pattern of business execution, planning strategy, operation methods, deploying and checking ERP software, data management, change management, user training, and post-maintenance support (Andrew, Ly. June 8, 2020).

Objectives

- To study the ERP implementation process.
- To study the current trends in ERP application.

Literature Survey

ERP System Step-Wise Implementation Process

The main seven steps of the ERP deployment are business process research, software installation, data migration, software performance testing, user training, total deployment, and after implementation support. We tried to study these steps in detail as below (Andrew, Ly, 2020),

1. **Business Process Research:** ERP implementation process starts with the definition of the requirement, objectives, and scope of ERP in the given business process (Turban et al., 2008). It further requires building a team that can work on the ERP deployment project from start to end. The team shall have the following structure of members 9 Menon, Sreekumar, July 2019),

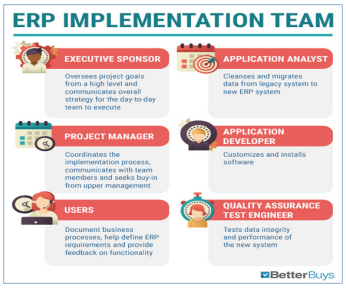

Figure 1: ERP Implementation Team (Andrew, Ly, 2020)

The Main Responsibilities of the Team are

- Map, document, and analyze the current processes in an organization (Yusuf, Y. et al., 2004).
- Try to identify major problems, wastage in the process, and customer-oriented issues.
- Set specific targets with precise quantification for an ERP deployment linked with the key performance areas.
- Set a good schedule with a cost budget.

2. **Software Installation:** After designing the new process flows in the first step team should possess a plan for a new business process. The software developer will install and build the infrastructure for software, such as data store, data display, and internet availability.
3. **Data Migration:** In this step, all information that is data is migrated to a new software system. All the data should be studied and corrected for the same unit before the actual transfer to a new location. This step includes a new data storage location setup, data mapping between the earlier and new store locations, and data transfer (Ramaswamy, V.K., September 27, 2007).
4. **Testing:** The quality engineer test all data interfaces, its functioning, and actual-time data transaction. Users must confirm that data is flowing precisely between different departments.
5. **User Training:** User training is based on ERP software complexity, and employees respond to change management. Under training results in production stoppages up to 56% case of ERP deployment after it goes live.
6. **Total Deployment:** Organization can choose one out of following three approaches depending on an ERP software size and the availability of the resources,

- **Big-Bang Approach:** A single day transition from the old to the new software. This approach is fast and cheap, but any deployment inefficiency may result in a major problem at operation.
- **Phased Approach:** A phased transition by function or unit that will consume longer time.
- **Parallel Operation Approach:** Users use old and new systems parallel that is the less risky. This approach requires more time for duplication

of the work, and the operating cost of the two systems is also high.

7. **Support:** ERP projects' performance evaluation during the complete life span of the project is very important. The following key performance indicators can be considered for the evaluation of the ERP project,
   - Actual implementation cost against planned budget
   - ROI that is investment returns.
   - Human error assessments.
   - Production or supply chain efficiency.
   - Customer satisfaction and loyalty.

ERP Implementation Time

ERP system implementation project can take three months to a couple of years before the system of software is deployed (Sankar, C. and Rau, K.-H., 2006). The exact time depends upon the organization's size, data size, user count, and resources (Pelphrey, M.W., 2015).

ERP Implementation Cost Incurred

The ERP system implementation costs are on-going ERP operating expenses such as,

- ERP software price depends on the license type and renewal frequency, data storage system, user count, and customization level.
- ERP software deployment consultants and trainers team.
- ERP software installation, after maintenance, and frequent upgrades.
- Data clouds.
- Support staff for system maintenance, time to time software upgrades, issues are fixing, and technical support.

Also, we must evaluate the proposed benefits to our budget to understand whether ERP deployment will be profitable. Small and medium-size companies can consider rupees 50 lacs and five crores expense for the ERP software implementation.

Choosing the Right ERP System Consultant

ERP system consultants must have implementation experience within our type of organization with the target of preventing the failure risk at each stage. Consultants may try to sell excess software by presenting its complete application. However, we must deploy only those required systems that will simplify the business and create returns on investment more quickly. Choosing the right ERP system consultant requires the following checkpoints (Andrew, Ly. June 8, 2020),

- Work experience at our kind of organization.
- They must understand the process of infrastructure set-up for our organization.
- Deploy only required systems.
- Answer the change management issues.
- Perform user training.

Current ERP Software Trends & Forecasts for Future

The ERP system was initially upgraded with the exclusive addition of the data cloud or data store management. Further digital transformation added some exclusive current trend or features to the ERP system explained below (Finances online, 2020),

Data Cloud Acceleration: Data cloud-based ERP is the game-changing trend. The ERP software is served at user location with hardware and start-up costs, which can be a high cost for small firms. The emergence of cloud computing helped users by major cost-cutting at the maintenance and upgrading of the software system. Business firms are also going for a hybrid ERP option. Hybrid ERP system integrates the good points of cloud and physical site based ERP while balancing the weaknesses of each other. This tool is very useful for firms in digital business and services. Some of the best ERP software in the market today is NetSuite, Sage Intacct, Syspro, Sage Business Cloud Enterprise Management, and Oracle ERP (Deskera, 2020).

Artificial Intelligence: AI that is an artificial intelligence with ERP, is termed as iERP. It helps businesses with fast processing of complex unstructured data with innovative ways and actionable insights. iERP is creating simplified workflows, reducing mistakes, reducing the data processing time, and more (Ruhi, Umar, 2016).

Mobile Application: Mobile had been earlier an "extra" belonging, but today it is a fixture. Today's ERP tool provides total mobile support by performing business processes anywhere and anytime with exceptional total productivity. For

example, employees can perform urgently required work from home instead of long hours at the office by accessing all the data on their mobile. Smart communication allows Mobile ERP to reduce the risk of delay in production. Mobile ERP also allows real-time decision-making, smooth workflow, and increased efficiency (Linchpinseo, 2020).

Big Data Analytics: ERP software is highly acknowledged for data collection and organization. ERP software today has an added capacity of data analytics, ad-hoc reporting, and data presentation. The organization uses it for critical decisions making like finance matters or other aspects which facilitates decision making feature from the manufacturing units to the individual executives. The future ERP shall analyze both data structured and unstructured. ERP software shall predict future trends based on data availability from all the departments that make a strong feature allocation of the predictive analysis.

3D Printing and Real-Time Data Support: Actual-time data access gives exact operation insights, timely decision making, customer satisfaction, and more. 3D printing is the current ERP trend in manufacturing, which allows companies for cost cut and better efficiency. CRM and ERP integrated software can give data like buying histories, favorites, and other requirements of the customer that help to better judge the opportunity of the sales, customer retention, and creating brand loyalty (Linchpinseo, 2020).

Finance Focussed ERP: Modern finance integrated ERP system gives routine ledger, money and payroll management, assets control, and more. Built-in modern ERP software facilitates fast decision making and strategy deployment. It allows the finance department to react to any incidents in real-time and adapt to required changes.

Digital Marketing Focuses: ERP real-time data helps to decide the target audience for marketing campaign strategy. Digital marketing integrated ERP is also using social media bases for decision making by collecting data like links sharing, post publishing, response collection on social media surveys, and more.

Personalized ERP Solutions: The small business adopted the modular approach for ERP implementation. In the 2019 modular approach changed to more personalized and vertical improvements at companies as they will get the improved solution without the need to depend on IT consultants or teams (Vilpola and Inka Heidi, 2008). This personalized ERP solution is tailor-made to fulfill the specific need of a particular industry (Loh, Tee Chiat, and Lenny Koh Siau Ching, 2004).

Additive Manufacturing: The adoption of additive manufacturing is another new trend in ERP in manufacturing. ERP provides the digitized data to the 3D printers with a single platform. ERP software monitors total production material count starting from raw, in-process, finished goods, and final dispatch. Sculpteo study says that 51% of companies are utilizing 3D printers in their manufacturing process.

IoT: IoT that is the Internet of Things, can offer smooth sensor connectivity in a data network with no human involvement. IoT and ERP together collect, review, and process big data via network sensors that further help to monitor the machine efficiency. In 2020 manufacturing industry has projected an investment of $40 billion on IoT platforms, services, and systems (Finances online, 2020).

Methodology

Main Problems or Gaps found in ERP System Application

We found out some gaps in the ERP implementation process that may results in failure as listed below,

1. Falling back to old practices: The ERP system application and standardization is a long time project that needs consistent adaption, and failing to it may result in falling back to old practices (Menon, S.A. et al., 2019).
2. Senior leadership strong support required: The ERP implementation requires a big-budget, long time involvement, and timely decision making over resource allocation.
3. Data Security (She, W. and Thuraisingham, B., 2007).
4. Exact business needs identification: ERP application consultants try selling complete solutions where business needs to define ERP requirements based on our targets (Brown, C. and Vessey, I., 2003).

5. Long term plans may get missed while ERP deployment to cater to current requirements (Bradford, M., 2015).
6. At the location, ERP software deployment requires a big initial budget and long timelines (Fryling, Meg, 2010) (Gentry, Spencer Rogers, and Sammy, 2018).

Proposed Solutions over ERP Implementation Gaps

An ERP software deployment may go wrong in the above-listed ways, so we proposed some actions for the success of the ERP system implementation as listed below,

1. An ERP implementation partner or project manager shall define the scope of the project based on the organization's team very precisely. Further, they shall define the responsibilities of the individual team members and prepare the resources required. A project manager shall present the scope and resources required list to senior leadership to get the buying over the proposed budget and time availability of the project before starting it.
2. Users training and change adaption management: All ERP software users must be trained with new systems and job responsibility so that they can adopt the change easily over the period.
3. Future growth plan and its scale: Future business expansion scope shall be outlined to skip from new change shall not set back our requirements for several weeks, months, or years ahead.

Conclusion

ERP system had used first by the large manufacturing organizations on-premise to manage the raw, in process, and finish good material information communication. ERP system acceptance rate had slow in the beginning due to ERP implementation is a time consuming and high investment process to adopt for any organization; however, it is adopted by nearly all the business nowadays and changing the business legacy due to its exceptional benefits. ERP systems got upgraded with advanced trends to work efficiently in the last decade and, further, every year added many break-through innovations to organizations. Mainly cloud-based ERP systems witnessed a high acceptance rate;. However, it has issues of data security and recurring subscription investment. Still, it is a cheaper option to on-premise and can be tailor-made according to business needs that helped much small business. We conclude this study as "an ERP system integrates all the functions in an organization like finance, marketing, manufacturing, and human resource with an advance real-time data collection, processing, and communication with very fast speed and allowing the organization for a quick decision on the real-time issues to control the complete business process day today."

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Assessment of the Leadership Style's and Its Deployment in Indian Organisation's

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ABSTRACT

Leadership is a key performance area at work and it drives the bottom line of every firm. Leadership style is a method that leaders practise to direct and motivate people to achieve set goals. This research work is trying to get a deep focus and analysis of leadership styles practised in India and to evaluate the deployment of these leaders in the different work areas in the same organisation context. The secondary data collected through direct observations of different work background leaders in India and their leadership styles, also primary data collected with 50 respondents as a sample through a survey instrument, based on a structured survey questionnaire to understand leadership effective deployment in the different work areas in the same organisation. The hypothesis was formulated and a one-way ANOVA *F*-test carried out to analyse the data specifically to assess the leadership styles and its deployment. Findings showed based on hypothesis test formulated that mainly three significant leadership styles exist in Indian organisations; also, different work background requires different leadership styles out of these three. Based on this research, I proposed a name to these three leadership styles model in the context of Indian organisations as 'Brahma-Vishnu-Mahesh Theory of Leadership Styles'.

Keywords: Leadership styles in India, Effective deployment of leadership, Organisational management, Current factors influencing leadership styles, Brahma-Vishnu-Mahesh theory of leadership styles

INTRODUCTION

Background

The role of leadership in an organisation is to visualise the goal, define the strategy to achieve the set goal, communicate this strategy to deep down effectively and execute this strategy efficiently by guiding and motivating the team (Xu and Wang, 2008). Good leadership performs the execution of the vision, mission well by time to time reacting to external factors (Harris *et al.*, 2007).

Nowadays, many organisations are going through problems like integrity not followed, high resignations, time-consuming return on investments, etc. This happens probably due to the less effective deployment of available leadership. The main target of every organisation is to achieve set targets. Here, it can be done by the deployment of the exact leader at required space for driving the teams effectively (Vigoda-Gadot, 2007).

Objectives

1. To have a deep insights and assessment about the main leadership styles in India.
2. To examine the effective deployment of these leadership styles in organisational management.

Scope of Work

1. Leadership styles in an organisation.
2. Different work areas in the organisation context.

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Motivation for Work

1. Work culture improvement.
2. Effective use of leaders.

LITERATURE REVIEW

Definition

Leadership style is the integration of character, quality of individual and nature that are practised for dealing with a team by their leader (Mitonga-Monga and Coetzee, 2012). Mitonga-Monga and Coetzee (2012) state that leadership as the set of the process considering the leader's nature, which is planned to join the company or self-motive and results to achieve a set of targets. Leadership style is an attitude that is practised by the leader to arrange all for working on set goals (Harris *et al.*, 2007).

Classification of Leadership Theories

The important leadership theories are

1. Trait theory of leadership
2. The behavioural theory of leadership
3. Situational approach theories of leadership.

Trait Theory of Leadership

Trait definition is a distinguishing characteristic, typically one belonging to a person.

The trait theory

1. Explain 'Qualities which makes a successful leader' from his self-personality.
2. Analyses the distinguished nature of the leading person.
3. Defines a set of criteria that the person possessing a certain character could be required leaders.

Trait theories of leadership attempt to find self-personality, distinguished nature or intellectual characters by which we shall identify leaders (Prasad, 2001).

The Behavioural Theory of Leadership

Leadership is demonstrated by the leader's actions in addition to his character. Behavioural theory includes four points that include leaders himself, his team, set targets and surroundings, which interact with each other in analysing behaviour demonstrated at a given condition.

Leadership actions are of two types

1. Actions that are working that can be considered as favourable.
2. Actions that are not working can be considered as not favourable.

Not favourable actions are equally important in the behavioural approach because they affect team morale.

Table 1: Characteristics of Successful Leaders

Trait/characteristics	Description
Drive	The desire for achievement, ambition, high energy, tenacity, initiative
Honesty and integrity	Trustworthy, reliable, open
Leadership motivation	Desire to exercise influence over others to reach shared goals
Self-confidence	Trust in own abilities
Cognitive ability	Intelligence, ability to integrate and interpret a large amount of information
Knowledge of the business	Knowledge of industry, relevant technical matters
Creativity	Originality
Flexibility	Ability to adapt to the needs of followers and requirements of a situation (Greenberg and Baron, 1999)

Source: Greenberg and Baron (1999)

The behavioural approach focuses on three skills of leadership to drive his team as follow

1. A leader's technical skills refer to his subject knowledge.
2. People skills which enable leaders to communicate with his team effectively and collaborate to achieve set targets.
3. Intellectual skills referring to innovative ideas and help leaders to drive for achieving set goals build strategy and structure the plans.

Situational Approach Theories of Leadership

The major target in the situational approach is attempted to the situation where leaders are working. Ohio State University findings have demonstrated four situational points that change the leader's performance under different situation as follows:-

- *Company's work culture:* Culture is the ideas, customs and social treatment of a particular company.
- *Dissimilar teammates:* Dissimilarity in intellectual ability, character, class of living, physic, hobby's and self-targets, age gaps, sex, work experience, etc. of each team member.
- *Dissimilar jobs:* The same team includes a member who is doing dissimilar jobs in the same company. Deployment of a member in jobs, which will satisfy him from four different criteria's namely financial, legal, self and social.
- *Dissimilar organisations:* Companies are dissimilar based on scale, entrepreneurship status, targets, hardship in the manufacturing process, leadership structure, company structure and cultural surroundings, etc. in dissimilar organisations, managerial actions tend to dissimilar.

The Path–Goal Theory of Leadership. The path–goal theory (PGT) of leadership is given by Martin Evans (1970) and Robert House (1971). They defined leadership theory efficiency by an approach of contingency which is referred with the expectancy theory of motivation (Umasekaran, 1996). PGT of leadership theory defines four points as follows

1. The direction in leadership.
2. Support by leadership,
3. Participation by leadership.
4. Achievement orientation by leadership.

The PGT states that any of the above four styles may be used by managers, based on the situation they are facing.

Fiedler's Contingency Theory. Fiedler (1967) constructed a model to state team ability to perform the effective task by considering 'Fit' to match at required work.

1. The manger's style (personal relationship based)
2. The manager–team member relationship based
3. Task and work structure based
4. The hierarchy of the manager based (Umasekaran, 1996).

McGregor's Theory X and Theory Y. McGregor gave two theories Theory X and Theory Y of managing the work which states some assumptions (Figure 1) about a person's character and acts.

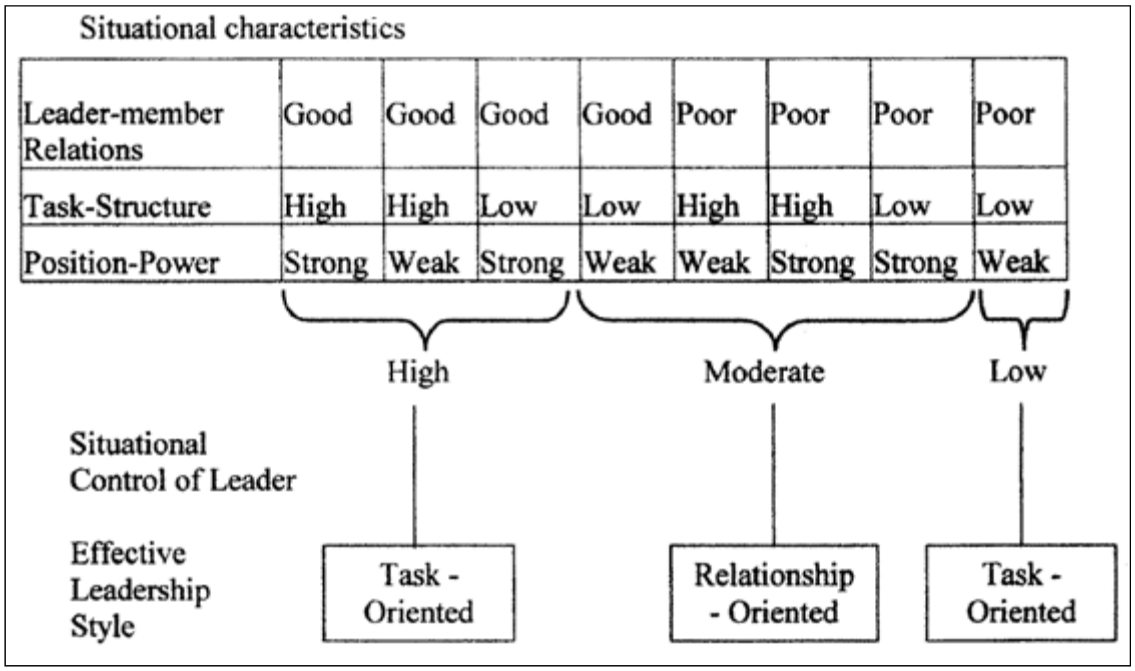
1. Theory X states that workers not liking his work and he gets coerced by his manager, it is also an old book, only work focused, authority-based approach.
2. Theory Y assumes that workers will be happy and fully efficient at his work if allowed to be a part of decision-making (Bittel, 1978).

Leadership Styles

Based on the above theories and research work, the main leadership styles are

1. Transformational
2. Charismatic
3. Transactional

Figure 1: Fiedler's Contingency Styles



4. Democratic
5. Autocratic
6. Bureaucratic (Harris *et al.*, 2007).

Transformational Leadership Style

It is centred at

1. Constructing the total value stream of the team-building ethics, capability, high motivation level and tracking team expectations.
2. Integration of leader and follower, to create clear guidelines referring to motivational level, needs and benefits.

Bass and Avolio (1994) define that transformational leadership happens when managers raise the interest of the team.

Charismatic Leadership Style

It is a style which

1. Build a vision and the team asked to follow and work on it.
2. It asks for innovation, creation and is well guiding to the employees.

But, the important drawback in this leadership style is

1. The team is dependent on the manager and if the manager leaves the company, the team gets clueless.
2. This issue further worsens as these leaders do not build their subordinates to be replacements in the further future.

Charismatic leadership style always results in a 'Satisfied team, but less future managers' (Ojokuku *et al*., 2012).

Transactional Leadership Style

This style pays many things in return (Uchenwamgbe, 2013) like

1. Employee growth and Payment rise
2. Employee key performance reviews with a new task, in exchange for some additional expectations fulfilment.

Hence, transactional leadership can be stated as the exchange of goals and promotions between the company management and the employees.

Democratic Leadership Style

Decision-making is shared by all the team members in

the democratic leadership style (Tannenbaum and Schmidt, 1973).

In this style

1. Probability for weak execution and bad decision-making is higher.
2. The second problem is the assumption that the team involved has the same stake in the decision-making and the same level of expertise (Rukmani *et al.*, 2010).

This leadership style appreciates and criticises objectively and a responsibility sense is also built among the team members (Elenkov, 2002).

Autocratic Leadership Style

Autocratic leadership style is explained as

1. Leaders are old book and bossy and want the team to work according to them.
2. Keep the decision-making rights at them only (Obiwuru *et al.*, 2011).
3. These leaders practice one-sided dialog and do not keep trust in their team members.
4. Their effects are for the short-term.

An autocratic leader decides the actions, strategy and mission to the team, and expects the team to follow them (Igbaekemen and Odivwri, 2015).

Bureaucratic Leadership Style

Bureaucratic leadership styles state that

1. These leaders try to influence the team under them to follow policies and strategies made by them.
2. They are strongly committed to their strategy and vision but not to their team.
3. They target their goals being fulfilled in a standard manner.

Current Factor Review Affecting the Leadership Styles

Until we have seen the leadership styles get change based on character, behaviour and situation now we shall study some current influencing factors to leadership styles.

Current Influencing Factors to the Leadership Styles

There are major five factors currently influencing the leadership styles namely

1. Globalisation in business (Prewitt *et al*., 2011)
2. Diversity in manpower
3. Flexibility at work
4. Flat organisation structure
5. Interpersonal networking

Let us see one by one in details

Globalisation in business. Globalisation means the integration of worldwide products, manpower, services to expand the business of organisations from their parent country to other countries (Scholte, 2005). In today's market, organisations need to supply the product and services competitively to remain in business. Many multinational organisations like Bosch, Siemens and General Motors trying to expand them in a country like India, the Philippines to service the need of the higher population. It also helps them to manufacture their products in their respective countries at cheap prices by deploying local manpower. In this context, local leaders need to understand their role as a bridging agent in multinational organisations and local staffing to get maximum profits (Prewitt *et al.*, 2011).

Diversity in manpower. Diversity is rather an old concept but trending currently due to rising involvement of female employees in staffing by many organisations, also increasing trend of working in a different state away from the birth state to grab carrier opportunities which are having different cultural, language, religious backgrounds in India. Globalisation further adds more

diversity to this by changing demographics. A developing country has always higher populations while the developed country has less manpower with greater amenity's results in the transition of manpower not only in India but also globally from higher to lower manpower areas (US Census Bureau, 2012). Naturally, people of different origins possess different attitudes, motivations and aspirations. This increasing diversity raises the extra need for leaders to focus on transited groups from the same region, religion.

Flexibility at work. To deal with dynamic demands in product organisations nowadays need to keep flexibility at their human resource in terms of the standard ratio of permanent and contract manpower. Leaders must need to define a flexible strategy to work with diverse manpower, demography (Saji, 2004). Flexibility may also be in terms of work at home or office, it can be on telecommunication or a laptop. Flexibility in work schedules may create laziness or higher burnout. To be in market organisation, leaders must plan a strategy against this kind of issue. Flexibility can also be multi-skilling by workers at the same time, variable contract manpower to respond volatile market.

Flat organisation structure. Today's continuously changing requirements of the lead time of product organisations need a faster response to demands placed. Many organisations keep short hierarchy and flat structure of decision-makers to react with high speed. Ultimate decision-making leaders make quick decisions as all team members are directly reporting to him (Trottier *et al.*, 2008).

Interpersonal Networking. Interpersonal networking between experienced leaders from the same college, school helps organisations to grow better. They can also share their problems, best practices to have maximum uptimes in manufacturing.

Current Trending Leadership Styles Practiced by Organisations

Leading Several Generations

Current organisations have an employee from all generations at a different hierarchy of organisation structure; hence, leaders must analyse the need of integrating all on a common platform to achieve the organisation's goals.

Higher Involvement of Females in Leadership Positions

A CNBC analysed that only 24 out of Fortune 500 listed companies are having a female CEO in 2018, hence global efforts started for higher involvement of females at power positions (Mejia, 2018).

High Pace Deliveries

Nowadays, customer demands of fulfilling his wish within the fastest lead time are the most important key performance area in all organisations. In the era of e-commerce, customers are not ready to wait at one seller, instead of that they find other options quickly to get their wish fulfilled.

Focus on Everyone's Accountability

As a business leader, one needs to keep accountability of each and everything in the organisation. To reduce overhead cost, most organisations allow work at home at flexible work timings, but that needs to get optimise on the productivity front.

Planning of Continuous Training

Technology is ever-changing to reduce cycle times, lead times of service and products. Employees need to educate when technology gets changed in their work areas to continue non-stop work.

METHODOLOGY

Gap Analysis in Leadership Style Practice in Indian Organisations

After studying the leadership theory, leadership styles and analysing the current Indian leaders through literature survey, following gap is identified

1. Need for an assessment regarding the standard leadership styles practiced by Indian leaders.

2. To examine whether the effective deployment of these leadership styles done or required in the Indian organisation context.

Research Technique

This research work uses the quantitative approach with a target of analysing the relationship between

a.) Dependent variable-organisational performance.

b.) Independent variable-leadership styles.

Data Collection

- Secondary data-Current Indian leaders and their leadership styles assessment.
- Primary data-Sample survey of 50 persons in an organisation.

Secondary Data

We selected top Indian leaders from different professions/backgrounds and enlisted their traits, behaviour; situational approaches practiced as in general observations as follows.

Cricket Background

Cricket is a well-known game played between two teams of 11 members each with bat and ball on the cricket ground. After the toss referee invite team who selected batting, they score runs on board at the same time other team bowls and fields to prevent the total run to the minimum possible. This game requires leadership by captains of both teams to win the game through teamwork, collaborations, patience and strategy. Following are some distinguished cricketing leaders with their traits, behaviour and situational approached to perform best in the cricket ground.

Rahul Dravid. He was a retired Indian cricketer and skipper of the Indian national cricket team. He is also called as most stable/dependable batsman on the ground with his best techniques on the ground (ESPNcricinfo, 2016). He was also known as the wall in test cricket. His key characters are dependable, disciplined and highly knowledgeable in his subject, calm, high temperament.

Sachin Tendulkar. He is a retired Indian cricketer and skipper of the Indian national cricket team. He is most loved and considered as the best batsman of all time in the history of world cricket. He scored maximum runs in all formats of all time. Tendulkar also received Bharat Ratna the highest civilian award for his best contribution to Indian cricket. His key characters are highly skilful, divine, sweet spoke in behaviour, humble, adapt to change, satisfied, charismatic.

Sourav Ganguly. He is a retired Indian cricketer and also a captain of the Indian national cricket team. He called Dada by Indian cricket lovers which means the eldest brother in the family. He considered a game changer in Indian cricket by his unique team-building skills. He was a short-tempered yet very stylish batsman at his time. His key characters are influencer, fearless, strict, and showing faith in others, energising, controversy child.

Hindi Cinema Background

The Indian film industry is the biggest in the world in terms of several films released in a year, with 1,986 cinemas reported in the year 2017. Hindi cinema which is also known as Bollywood cinema contributes 364 out of 1986 in 2017 (Film Federation of India, 2017). Hindi cinema also has shares of 43% of total Indian cinema earnings. Hindi cinema is always centred on family drama, Indian family values. After a decade of Amitabh Bachhan era in Indian cinema, the Khan trio had led the Indian cinema in the late nineteenth century and had influenced the Indian generations over the past 30 years.

Aamir Khan. He is a well-known artist and financer in Indian Cinema for the last 30 years. Although he is in Indian Cinema for 30 years, he got huge recognition in the late nineteenth century after lagan movie as a mass hero. He enjoys a fan following through all parts of the world, in the past 2 years, he also got huge recognition in china and considered as big superstar in the world from Indian origin. He received much recognition as awards,

which are nine Filmfare and four National Film Awards. His key characters are perfectionist, knowledgeable, cool, disciplined, thoughtful.

Shah Rukh Khan. He is an Indian artist and television anchor. Popularly, he is known as King Khan of Hindi Cinema, King of Romance, he acted in 80 plus Hindi films and received many awards including 14 Filmfare for the best actor. He enjoys a great fan following all over the globe. He considered as most bankable star of Indian cinema in the world. His key characters are charming, family oriented, popular, romantic, lucky, evolving.

Salman Khan. He is an Indian artist, anchor, singer, financer and social worker. He is considered as the most commercially successful artist of both India and the world in his 30 years carrier. He has 82nd ranked and only in top 100 from India in *Forbes* most earning celebrity of 2018 (Forbes, 2018). His key characters are committed, influencer, easily pleased, possessive, fearless, kind-hearted, charitable, followed by C-class, fitness focused, short-tempered, energising.

Hindu Mythological Background

Hindu mythology covers a wide range of topics which include creation, nourishing, destroying the world by superpowers. It states how the world got created from the start point, also from where the life of humans started and got build, it also tells positive and negative points of all these stories. It also talks about evil powers, it guides on values and ethics which can be practised by humans to live together start and end of the life cycle, what are the best standards to live a healthy life. Brahma, Vishnu and Mahesh are considered as three gods who are responsible for making, controlling and destroying are mentioned as a trio of superpower gods. Brahma is maker, Vishnu is controller and Shiva is destroying the things which got created (Sarvepalli, 1956).

Brahma. He is the maker out of three main deities. He is considered as self-born. He created a base of knowledge called as ved includes four types, stated by him from his every mouth of four faces. His key characters are creative, beyond ego, peace-loving, disciplined, highly knowledgeable, ethical and popular in A-class/upper class.

Vishnu. He is most worshiped, loved deity in Hindu mythology; he is controller out of the main three and considered as the supreme power. He also called as conserver. In Hindu mythology, he considered as protector and he takes every time a new avatar to save mankind from evil forces. Ram and Krishna are considered as his famous avatar in Hindu mythology. He is considered as converting wish into the fact of his devotee. His key characters are commanding, hero of B-class/middle class, and romantic/sweetness in appearance, speech and behaviour, lucky, elusive, skilful, divine and humble.

Mahesh. He is worshipped the most by masses and stated as destroyer deity out of the main three. He also considered the god of power. He is considered as without shape, without limit, not changing in any condition and heart of the globe. He also considered as a yogi who lives in mountains still his wife also stated that lives with him. He is also known as Nataraja that is an artist. His key character is highly committed to words, highly intolerant to injustice, highly influencer, live without desire, easily pleased if shown true devotion, fearless, kind-hearted and do lots of charity, largely popular and followed by C-class people/devotees, focused on fitness, strict.

Business Background

A business person is the one who identifies need/demand of product or service by mass, he organises resource like land, people, machines, infrastructure to produce and sell it or just trade it to make profits. Term business person is also used for the person who is leading a firm, enterprise as an employee of that organisation. A business person who is running a start-up is called an entrepreneur.

Narayan Murthi. He is an electrical engineer, expert in information technology who co-founded a well-known multinational company named Infosys (Muthyala, 2015). Infosys is providing a service to build technology,

engineering research to create a solution for many organisations with its information technology expertise. Murthy had varied experience as information technology administrator in the Indian Institute of Management, Ahmedabad- and Pune-based Patni computers before starting Infosys. Infosys was founded in 1981 by him and he acted as Chief Executive Officer until 2011. His key skills are beyond the ego, creative, peace-loving, ethical and disciplined.

Mukesh Ambani. He is the owner of Reliance Industries Limited. Reliance industry is highest in terms of value in the Indian business industry and also listed in Fortune 500 multinational companies. *Forbes* March 2019 survey states that he is the 13th richest man in the world. His key characters are family-oriented, elusive and lucky.

Aanand Mahindra. He is the lead of the Mahindra & Mahindra group of companies. Mahindra has a presence in aeronautics, agro, post-market, automobile, auto-component, heavy construction machinery, national defence instruments, farming, insurance and financing operation, hotels, shipment, construction work and infra-structure. He is listed in the world's top 50 greatest leaders by Fortune. He got recognised in the top 25 highly powerful leaders list at the business of Asia by the fortune in the year 2011 (CNN Money, 2014). His key characters are committed, influencer and fitness focused, strict, fearless.

Political Background

Politics is the science of driving a group of people in an organised way of vision, mission, strategic plan to achieve the vision and managing this change smoothly. It refers to driving the group of people in maybe cities, states, nations by providing resources committed while setting objectives. In-state or nation politics, many political groups go through official election through voting by people living in the respective areas under democracy and further they rule the respective nation. These election merits are based on the values, vision, and commitment shown by political party leaders to people who are voting.

Manmohan Singh. He is well known as the economy expert in India and he had been a prime minister of India for the year 2004–2014. He received his Ph.D. at Oxford in economics. He also serviced at United Nations in the year 1966–1969. At the same time, he started a political work while he got selected by Mr. Lalit Mishra as a consultant at the Commerce ministry. He led many key positions in the Indian government such as lead economy consultant from the year 1972–1976, Reserve bank governor from the year 1982–1985 and as a planning commissioner from the year 1986–1987. His key character is creative, knowledgeable, calm and peace-loving.

Sharad Pawar. He is a well-known political leader from Baramati, Maharashtra base. He has a strong presence in all talukas, city and Maharashtra state politics and considered as one of a great leader in politics of all time in Maharashtra state and he served as chief minister of Maharashtra state three times, defence minister and agriculture minister in the government of India during his long 50 years of political leadership. He founded the nationalist congress party after separation from Indian national congress in 1999 and subsequently won the assembly election in Maharashtra state jointly with the Indian national congress party. His key skills are elusive, adaptive, humble, sweet-spoken.

Narendra Modi. He is a very prominent politician in Indian politics, elected from Varanasi constituency as Member of Parliament and worked as 14th Lok Sabha prime minister and continued after his 5-year tenure completion in 2019. He is elected with the full majority twice only after Indira Gandhi. He also served as chief minister of Gujarat state for consecutive 10 years before elected as Indian prime minister. His key characters are committed, influencer, fitness focused, strict, fearless, popular in devotees and kind-hearted.

Hypothesis Test Assumption

We are assuming that there are three main types of leadership styles practiced by Indian leaders based on the detail secondary data and mainly based on behaviour,

traits and situational actions practised by Current Indian leaders from different work backgrounds are as follows

- *Leadership style one*. Silent, creative, beyond ego, peace-loving, disciplined, highly knowledgeable, ethical and popular in A-class/upper class, dependable and perfectionist.
- *Leadership style two*. Commanding, hero of B-class/ middle class and romantic/sweetness in appearance, speech, behaviour, lucky, elusive, skill full, divine, humble and charming.
- *Leadership style three.* Highly committed to words, highly intolerant to injustice, influencer, live without desire, easily pleased if shown true devotion, fearless, kind-hearted and do lots of charity, largely popular and followed by C-class people/devotees, focused on fitness, strict, caring.

Primary Data

To validate the assumption that there are three main types of leadership styles practiced by Indian leaders, primary data are by a set of questionnaires asked to sample selected from the group of employees.

Sampling Plan

We took two sample survey as follow

1. We have surveyed 50 persons from Legrand, India Nasik manufacturing function team with five samples of a group of 10 to identify leadership styles practised at their organisations as follows (Kothari, 2004).

Consolidated form of the above survey is as follow in Table 2

Table 2: The Consolidated Result for the Leadership Styles Sample-Based Survey in the Same Work Area

Samples 10 no's each	Leadership Style one (X1)	Leadership Style two (X2)	Leadership Style three (X3)
Team 1	3	4	3
Team 2	4	4	2
Team 3	3	5	2
Team 4	2	5	3
Team 5	3	4	3

2. We have carried out a survey of 50 persons from different function in same organisation Legrand, India Nasik plant with five samples of a group of 10 to identify leadership styles practised at their organisations as follow:

Consolidated form of the above survey is as follow Table 3.

Table 3: The Consolidated Result for the Leadership Style Sample Survey in a Different Work Area

Work Area	Leadership Style one (X1)	Leadership Style two (X2)	Leadership Style three (X3)
Marketing	1	6	3
HR	5	3	2
Finance	8	2	0
Manufacturing	1	2	7
R & D	6	4	0

ANALYSIS AND FINDINGS

Problem Statement One

Are three main types of leadership styles practiced by Indian leaders to get success in their work areas?

Hypothesis Statement

A hypothesis statement is as follows

H0 = mainly three leadership styles identified in Indian leaders are the same.

Ha = mainly three leadership styles identified in Indian leaders are not the same.

As the given problem statement is a one-way design of experiment without repeated values, first, we calculate the mean of each of these samples

X1 mean = (3 + 4 + 3 + 2 + 3)/5
= 3

X2 mean = (4 + 4 + 5 + 5 + 4)/5
= 4.4

X3 mean = (3 + 2 + 2 + 3 + 3)/5
= 2.6

Mean of samples means X mm = (X1 mean + X2 mean + X3 mean)/3

= (3 + 4.4 + 2.6)/3

X mm = 3.33

Now, we work out SS between and SS within samples

SS between = n1 (X1 mean – X mm) 2 + n2 (X2 mean – X mm) 2 + n3 (X3 mean – X mm) 2

= 5(3 – 3.33) 2 + 5(4.4 – 3.33) 2 + 5(2.6 – 3.33) 2
= 5(– 0.33 2 + 1.07 2 + – 0.73 2)
= 5(0.1089 + 1.145 + 0.5329)

SS between = 8.934

SS within = Σ (X1i – X1 mean) 2 + Σ (X2i – X2 mean) 2 + Σ (X3i – X3 mean) 2

= ((3 – 3) 2 + (4 – 3) 2 + (3 – 3) 2 + (2 – 3) 2 + (3 – 3) 2) + ((4 – 4.4) 2 + (4 – 4.4) 2 + (5 – 4.4) 2

+ (5 – 4.4) 2 + (4 – 4.4) 2) + ((3 – 2.6) 2 + (2 – 2.6) 2 + (2 – 2.6) 2 + (3 – 2.6) 2 + (3 – 2.6) 2) ……i=1, 2, 3, 4, 5.

= (1 + 1) + (0.16 + 0.36 + 0.36 + 0.16) + (0.16 + 0.36 + 0.36 + 0.16)

SS within = 2 + 1.04 + 1.04 **= 4.082**

SS for total variance = Σ (Xij – X mm) 2 ……i, j = 1, 2, 3, 4, 5.

= (3 – 3.33) 2 + (4 – 3.33) 2 + (3 – 3.33) 2 + (–3.33) 2 + (3–3.33) 2 + (4 – 3.33) 2 + (4 – 3.33) 2 + (5 – 3.33) 2 + (5 – 3.33) 2 + (4 – 3.33) 2 + (3 – 3.33) 2 + (2 – 3.33) 2 + (2 – 3.33) 2 + (3 – 3.33) 2 + (3 – 3.33) 2

=0.1089 + 0.4489 + 0.1089 + 1.7689 + 0.1089 + 0.4489 + 0.4489 + 2.7889 + 2.7889 + 0.4489 + 0.1089 + 1.7689 + 0.1089 + 0.1089

= 0.6534 + 1.7956 + 5.3067 + 5.5778

SS for total variance = 13.333

We can now set up the ANOVA table 4 for this problem.

The above table shows that the calculated value of *F* is 13.0344 which is higher compare to standard value given in the table of 5 at level of 5% with d.f. being *v*1 = 2 and *v*2 = 12 and hence there is significant difference in actual and tabulated *F*-values. This analysis supports the alternative hypothesis of differences in sample means.

We may conclude that there is a significant difference in Identified three main Indian leadership styles.

Problem Statement Two

Is different work background having different leadership styles in an organisation?

Hypothesis Statement

A hypothesis statement is as follows

H0 = Different work backgrounds require different leadership styles.

Ha = Different work background does not require different leadership styles.

As the given problem statement is a one-way design of experiment without repeated values, first we calculate the mean of each of these samples

X1 mean = (1 + 5 + 8 + 1 + 6)/5
= 4.2

X2 mean = (6 + 3 + 2 + 2 + 4)/5
= 3.4

Table 4: ANOVA Results for Problem Statement 1

Source of variation	SS	df	MS = SS/df	*F*-ratio = MS BS/MS WS	5% *F*-limit
Between sample	8.934	(3 – 1) = 2	4.433	13.0344	*F* (2,12) = 5.16
Within sample	4.082	(15 – 3) = 12	0.3401		
Total	13.333	(15 – 1) = 14			

X3 mean = (3 + 2 + 0 + 7 + 0)/5
= 2.4

Mean of samples means X mm = (4.2 + 3.4 + 2.4)/3

X mm = 3.33

Now, we work out SS between and SS within samples

SS between = n1 (X1 mean – X mm) 2 + n2 (X2 mean – X mm) 2 + n3 (X3 mean – X mm) 2

=5(4.2 – 3.33) 2 + 5(3.4 – 3.33) 2 + 5(2.4 – 3.33) 2

=5(– 0.87 2 + 0.07 2 + – 0.93 2)

= 5 (0.7569 + 0.049 + 0.8649)

SS between = 8.354

SS Within = Σ (X1i – X1 mean) 2 + Σ (X2i – X2 mean) 2 + Σ (X3i – X3 mean) 2

= (1 – 4.2) 2 + (5 – 4.2) 2 + (8 – 4.2) 2 + (1 – 4.2) 2 + (6 – 4.2) 2) + ((6 – 3.4) 2 + (3 – 3.4) 2 + (2 – 3.4) 2 + (2 – 3.4) 2 + (4 – 3.4) 2) + ((3 – 2.4) 2 + (2 – 2.4) 2 + (0 – 2.4) 2 + (7 – 2.4) 2 + + (0 – 2.4) 2) ……I = 1, 2, 3, 4, 5.

= (10.24 + 0.64 + 14.44 + 10.24 + 3.24) + (5.76 + 0.16 + 1.96 + 1.96 + 0.36) + (0.36 + 1.96 + 5.76 + 21.16 + 5.76)

= 38.8 + 10.2 + 35

SS within = 84

SS for total variance = Σ (Xij – X mm) 2 ……i, j = 1, 2, 3, 4, 5.

= (1 – 3.33) 2 + (5 – 3.33) 2 + (8 – 3.33) 2 + (1 – 3.33) 2 + (6 – 3.33) 2 + (6 – 3.33) 2 + (3 – 3.33) 2 + (2 – 3.33) 2 + (2 – 3.33) 2 + (4 – 3.33) 2 + (3 – 3.33) 2 + (2 – 3.33) 2 + (0 – 3.33) 2 + (7 – 3.33) 2 + (0 – 3.33) 2

= 5.429 + 2.789 + 21.809 + 5.429 + 7.129 + 7.129 + 0.109 + 1.769 + 1.769 + 0.449 + 0.109 + 1.769 + 11.089 + 13.469 + 11.089

= 42.585 + 11.225 + 37.525

SS for total variance = 91.335

We can now set up the ANOVA Table 5 for this problem.

The Table 5 shows that the calculated value of *F* is 0.59 which is less compared to the standard value given in Table 5 at level of 5% with d.f. being $v1 = 2$ and $v2 = 12$ and hence there is no significant difference in actual and tabulated *F*-values. This analysis supports the null hypothesis.

We may, therefore, conclude that different work background requires leadership styles.

Findings

Above hypothesis study and research work states that,

1. Mainly three significant leadership styles exist in Indian organisations as follow

- *Leadership style one*. Silent, creative, beyond ego, peace-loving, disciplined, highly knowledgeable, ethical, and popular in A-class/upper class, dependable and perfectionist.
- *Leadership style two*. Commanding, hero of B-class/ middle class and romantic/sweetness in appearance, speech, behaviour, lucky, elusive, skilful, divine, humble and charming.
- *Leadership style three*. Highly committed to words, highly intolerant to injustice, influencer, live without

Table 5: ANOVA Results for Problem Statement 2

Source of variation	SS	df	MS = SS/df	*F*-ratio = MS BS/MS WS	5% *F*-limit
Between sample	8.354	(3 – 1) = 2	4.177	0.59	F(2,12) = 5.16
Within sample	84	(15 – 3) = 12	6.91		
Total	91.335	(15 – 1) = 14			

desire, easily pleased if shown true devotion, fearless, kind-hearted and do lots of charity, largely popular and followed by C-class people/devotees, focused on fitness, strict, caring.

2. Different work background requires different leadership styles out of these three.

Hence, a person must have any one of the above three styles of leadership to become successful in his working field, he may identify it in himself and further enhance the styles in respective leadership types.

CONCLUSION

This research work has centred on assessment of leadership styles practised in Indian organisations, leadership type's deployment at different departments in respective organisations. We collected primary qualitative data through observation and quantitative data through questioners. From primary qualitative data through observation, we proposed that there are mainly three significant leadership styles exist in Indian organisations, also proved this hypothesis by setting one-way ANOVA test, also we carried out one-way ANOVA test on quantitative data through questioners and concluded different work background requires leadership styles out of these three.

In the end, I propose a name to these three leadership styles model in the context of Indian organisations as 'Brahma-Vishnu-Mahesh Theory of Leadership Styles'.

Leadership type	Leadership style
Brahma	Silent, creative, beyond ego, peace-loving, disciplined, highly knowledgeable, ethical, popular in A-class/upper class, dependable, perfectionist.
Vishnu	Commanding, hero of B-class/middle class, romantic/sweetness in appearance, speech and behaviour, lucky, elusive, skilful, divine, humble, charming.
Mahesh	Highly committed to words, highly intolerant to injustice, influencer, live without desire, easily pleased if shown true devotion, fearless, kind-hearted and do lots of charity, largely popular and followed by C-class people/devotees, focused on fitness, strict, caring.

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Research Article

Artificial Intelligence Deployment Pilot Study at Manufacturing Industry

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ABSTRACT

Smart robot and feigned reality had been seen previously in the Greek antiquity story. Aristotle's logic building and its argument ability was a milestone in human's prospect to know self-intelligence. Artificial intelligence is also known as AI had been present in every field from the past century with continuous development in it over the years. We studied the AI evolution from 1943 neural network, machine learning, to deep learning till 2016 in detail introduction. In 2016, Hintze, an assistant professor at Michigan State University, described four main types of AI starting with today's task-customised intelligent computer systems and ending at responsive computer systems which do not available currently. The four main types are reactive machines, limited memory, the theory of mind and self-awareness. Further, we tried to explore AI subareas, a stepwise implementation guide for business, importance, applications and limitations in a detailed literature survey. In methodology, we executed AI pilot project deployment step by step by selecting a small pilot area a compliance high-voltage testing of the finished product before sending to the customer for improving the cycle time of the testing process at the electrical power product manufacturing company. We received a benefit of process cycle time improvement, improved traceability, higher productivity and real-time data availability with the AI application in this project. We concluded this study with the main goal of AI is to deploy software that can analyse the input and give the required output. AI provides man-like communication with software and helps in decision-making for a given task, AI is not a man replacement, but AI improves the overall productivity, trust on the process, traceability of product based on real-time captured data and lead time of total process to improve the customer satisfaction exceptionally.

Keywords: AI, AI evolution, ML, Deep learning, Neural networks

1. INTRODUCTION

1.1 Background

Smart robot and feigned reality had been seen previously in the Greek antiquity story. Aristotle's logic building and its argument ability was a milestone in human's prospect to know self-intelligence (Builtin, 2020). Artificial intelligence is also known as AI had been present in every field from the past century with continuous development in it over the years. AI has broadly three stages of developments as mentioned below:

a. Neural networks (1940–1970)

b. Machine learning (1971–2010)

c. Deep learning (2011–2020)

Let us see this development journey stage wise in detail as explained below.

1.2 Definition

Artificial intelligence can be a device that is programmed to achieve its targets. Similarly, the term 'AI' is often used to describe machines that copy human cognitive character such as learning and problem solving (Russell *et al.*, 2003). AI capability examples include human

Neural Network	
McCullough and Pitts presented a research paper with the title 'A Logical Calculus of Ideas Immanent in Nervous Activity'. They had given the first algorithmic model for a neural network building (McCulloch *et al.*, 1943).	1943
Hebb had proposed a neuropsychological theory in his book the organisation of behaviour (Hebb, 1949). He explained that neural pathways are generated based on experience and neuron connection becomes stronger with increasing frequency of use.	1949
Turing had given the Turing test for deciding machine intelligence (Turing, 1948). Marvin and Edmonds had prepared SNARC the first computer neural network (Minsky and Papert, 1969). Shannon had built a chess-playing program for the computers. Asimov had given the 'Three Laws of Robotics'.	1950
Samuel had prepared a checkers to play self-learning program (Samuel, 1959).	1952
The Georgetown-IBM machine had translated 60 sentences from Russian to English.	1954
The artificial intelligence word had coined at the Dartmouth Summer Research Project the conference led by McCarthy, which defined AI is considered as the birth point of AI.	1956
McCarthy further built the Lisp an AI programming language in his research paper. The paper proposed that the AI system learns from its experience as efficiently as we humans can (McCarthy, 1960).	1958
Newell *et al.* had developed a program to copy human problem-solving (Newell et al., 1958). Gelernter had developed the Geometry Theorem. Samuel had coined the phrase machine learning (Gelernter, 1959).	1959
McCarthy had started the Laboratory for AI research at Stanford.	1963
The US government's Automatic Language Processing Advisory Committee had reported the lack of progress in machine translation research.	1966
MYCIN had developed a program to identify infections in blood at Stanford (Copeland, 2018).	1969
Machine Learning	
The logic language PROLOG is developed (Kowalski, 1988; (Colmerauer and Roussel, 1993).	1972
The British government released the 'Lighthill Report' on the AI flaws led to severe AI projects funding cuts.	1973
AI's Negative ALPAC and Lighthill reports gave big academic grant cuts. This is 'First AI Winter'. (Schuchmann, 2019)	1974-1980

DEC had developed the first commercial expert system R1 to configure orders for a new computer. It gave investment in expert systems for the decade and ended the first 'AI Winter'.	1980
Japan's International Trade and Industry Ministry had launched the Fifth Generation Computer Systems project.	1982
US government launched the Strategic Computing Initiative to provide DARPA funded research in advanced computing and AI.	1983
Companies namely Symbolic and Lisp Machines built AI running specialised computers.	1985
The Lisp machine market collapsed in 1987 due to computing technology development started in the 'Second AI Winter'. (Schuchmann, 2019)	1987-1993
IBM's Deep Blue had beaten the world chess champion Gary Kasparov (History, 1997).	1997
The US military used robots like 'Big Dog' and 'PackBot'. (Heater, 2012).	2005
Google had done innovation in speech identification and given this feature in its iPhone app.	2008
Deep Learning	
IBM's Watson trounces the competition on Jeopardy (BBC News, 2011).	2011
Andrew the founder of the Google Brain Deep Learning project feeds a neural network using deep learning algorithms 10 million YouTube videos as a training set. The neural network learned to recognise a cat without being told what a cat is (Liat Clark, Wired UK, 2012).	2012
Google makes the first self-driving car to pass a state driving test (Telegraph, 2012).	2014
Google Deep Mind's Alpha Go defeats world champion Go player Lee Sedol (Moyer, 2016). The complexity of the ancient Chinese game was seen as a major hurdle to clear in AI.	2016

speech recognition, competing games such as chess (Schank, 1991), operating car autonomously and military simulations (SAS, 2020).

1.3 Objectives

To study the AI stepwise deployment process in the manufacturing industry.

2. LITERATURE REVIEW

2.1 AI Types

In 2016, Hintze, an assistant professor at Michigan State University, described four main types of AI starting with today's task-customised intelligent computer systems and ending at responsive computer systems which do not available currently. The four main types are as described below.

Reactive Machines

Reactive machines AI systems are customised without memory. An example is Deep Blue without memory which can recognise the chessboard pieces and perform actions. But, it does not communicate future response as it is not using earlier experiences.

Limited Memory

Limited memory AI systems can use earlier experiences to communicate future decisions. Self-driving cars are developed with this technique.

Theory of Mind

It means that the system will realise emotions which will analyse human intent and guess human behaviour. It is considered as a required skill for AI to integrate the machines with the human teams.

Self-Awareness

AI has a self-awareness that allows it to responsiveness character. Machines with this feature understand its current condition. This kind of AI yet does not available.

As the AI had started gaining popularity, sellers had started their products and services promotion linkage with AI. AI needs a base customised hardware and software with a programming language such as Python, R and Java for writing ML mathematical models (Techtarget, 2020).

2.2 AI Subareas

AI integrates big data with high speed and intelligent algorithms which allows the software to self-learn the data. AI has the following important three subareas.

A Neural Network

It is an interconnected neuron unit that works on the information by reacting to various inputs. The process concludes the meaning based on the undefined data inputs.

Machine Learning: It uses neural networks, operations research, statistics and physics to analyse the data without being programmed for any conclusion.

Deep Learning: It uses complex neural networks with many processing units' layers to analyse complex spread in big data. Common examples include speech recognition.

Further, some more subareas of AI are explained below.

Cognitive Computing: It aims for human-like communication with manufacturing machines. The final goal is simulating like human processes by interpreting given speech and images with return response.

Computer Vision: It depends upon the pattern identification and further deep learning to analyse from a captured picture. Here, machines can capture, analyse and conclude the images in real-time and interpret their condition.

Natural Language Processing: It is the computer's capability to analyse, grasp and prepare a human speech. NLP's next stage is the natural real-time interaction of humans with machines to perform given tasks.

Graphical Processing Units: GPA provides big computing power required for consistent data processing by neural networks.

The Internet of Things: IoT creates big data from all connected devices.

Advanced Algorithms: They are built to analyse the data with faster speed to predict rare incidents, interpret complex conditions and optimise the unique situations.

Application Programming Interfaces: API can give a picture identification feature to house security machines.

2.3 AI Stepwise Implementation Guide for Business

Understanding the AI and ML Difference

AI and ML have completely different applications. AI dealing with programmed machine's ability to behave and think like a humans. For example, voice, picture and speech identification. ML gives the learning ability to machine without being programmed. ML is a field of AI which says machine learn from data and take decisions without people involvement.

2.4 Define Business Needs

We need to define, what we are targeting to achieve. We must define the problems by answering the following five questions to apply AI:

- What results we are targeting?
- What are the key bottlenecks to get these results?
- How can AI support to achieve these results?
- How we are going to measure the result?
- What data we have and what will be required to achieve these results?

Define the Main Value

Further, we need to trace the probable business and financial benefits from the selected AI project. We need to check the return on investment probability to best optimise the AI project implementation plan. Nothing is permanent. Rather, we can find out an AI solution for our daily work process and it would raise our operating performance over the long-time.

Evaluate Our Internal Potentials

There is always a gap between our target and actual achievement for a defined time limit. Here, we need to decide the approach to achieve our objectives such as,

- Developing new ideas using our internal resources.
- Deploying an expert partner for our AI project.
- Outsourcing the total AI deployment plan.

If we got a partner or product that caters to our requirements, then we may approach a direct integration with them.

Consulting with Domain Experts

AI is a tailor-made solution to close the specific needs. It needs experience and skill to prepare algorithms that will guide the machines to think, analyse, optimise and improve the business processes. AI experts help to avoid both planning and manufacturing errors.

Develop Our Data

AI model work when we set fixed targets. Therefore, we need quality data before we start for AI implementation. Required data set required to be

- Free from confusing facts.
- Data should be correct or precise.
- Allocated inputs are required for an algorithm to do its duty.

Hence, we need to prepare, arrange, and expand the data set with set frequency.

Start Small or in the Pilot Area

We are now ready to initiate the AI project implementation by this final stage. However, we need to start with small a work area or pilot area. Further, spread the AI solution parallel at other areas after success in the completed pilot area and with all cross-functional team support. We can transfer from low-risk AI pilot projects to ambitious project plans after getting confidence to form our initial AI project strategy success (Majewski, 2020).

2.5 AI Importance

Following are some key AI importance or benefits:

a. AI automates continual data learning. It executes frequent and big-volume system tasks without fatigue.

b. AI put on intelligence to products we are already using which are upgraded with AI features like Siri is an AI feature addition to Apple's new generation products.

c. AI upgrades by continuous learning models where the data perform real-time programming. AI investigates the pattern in data so that the mathematical model works as a classifier [1-5].

d. Neural networks allow analysing deep data with many hidden layers. Five hidden layers fraud identification system may be a dream a few years ago. But, AI made it possible by integrating big data with computer analysing capability.

e. AI gives great accuracy, for example, Alexa talks, Google Search and Google photos. In the medical field, AI's object identification feature can be used to detect cancer based on MRIs report; real-time data create a winning advantage (SAS, 2020).

2.6 AI Applications

AI can be applied in the different fields as explained below:

a. ***Health Care:*** AI applications provide self-health care support and act as a scheduler.

b. ***Retail:*** AI allows virtual shopping with purchase discussions for customers.

c. ***Manufacturing:*** AI can forecast product demand using recurrent or customised deep learning networks utilised with input sequence data.

d. ***Banking:*** AI identifies fraudulent transactions, perform precise credit scoring and automate manually intense data in banking institutions.

2.7 AI Limitations

AI is changing and upgrading every field, but some limitations over it listed below.

AI Gets Driven by the Data

Any data inaccuracies affect the final result accordingly. Also, additional prediction layers need to be separately added.

AI Performs a Defined Task

The AI can play only programmed games at a time for example chess. Also, an AI finding health care problem cannot find financial fraud.

AI Self-Learning Is Not Autonomous Systems

AI technologies in movies are science fiction.

3. METHODOLOGY

3.1 AI Pilot Project Deployment

The electrical power product manufacturing company at Nasik, India, is a bus bar trunking 630–5000 ampere current rating system manufacturing unit mainly used for transferring current from the transformer to the high rise buildings all floors. The product is also used in the malls, hospitals and industry infrastructure to transfer high values of current from transformer to user location.

3.2 AI Pilot Project Deployment Step by Step

Define Business Needs

The customer expects the complete product delivery within 3 weeks leads time after order booking. To attain this lead time, we planned to deploy the AI concept.

Define the Main Value

We initiated the AI deployment by selecting small pilot area compliance high-voltage testing of the finished product before sending it to the customer for improving the cycle time of the testing process [6-12].

Evaluate Our Internal Potentials

We have a high-voltage testing unit with the capacity of the 3.2 KV test at the work station. We studied this process in brief and derived the following opportunities for AI application.

HV testing is done manually by touching the HV probe to RYBN conductors manually 14 number of times and result data are manually written in the notebook by the worker.

1. The FG sticker is allocated by the supervisor to the worker manually.
2. The production declaration of FG is done at the end of the day in the ERP system by referring to the notebook.

i. *Consulting with Domain Experts:* To answer these manual activities, we initiated an AI project with a local consultant and found out the tailor-made solution as below:

a. Develop a fixture instead of manually touching probe with RYBN to every finished product only once and that will record the data directly in the machine cloud.

b. We will add a barcode on the FG sticker and the operator will scan this barcode to link that data with the product in the system.

c. At the time of scanning the barcode, production declaration will also happen in ERP by direct linkage.

ii. Develop Our Data: After the execution of the process improvement plan, we are receiving the real-time HV testing data and production declaration that improved the FG traceability even after the FG dispatch.

3.3 AI Pilot Project Benefits Realised

We received the following benefits after AI implementation:

1. Shifting from manual probe to programmed fixture resulted in the 19.5 s/product cycle time reduction at HV testing operation.
2. FG HV testing data are started saving from the HV testing machine to the data cloud and available in real-time for further analysis.
3. This FG HV real-time data improved the trust of traceability as HV is a compliance test for the products.
4. FG sticker direct linkage with the HV machine resulted in the error-proofing of sticker mismatch.
5. FG barcode scanning introduction and real-time production declaration in the ERP by scanning results in supervisor work elimination of at the end of the day [13-24].

4. CONCLUSION

We studied the AI evolution from 1943 neural network, machine learning, to deep learning till 2016 in detail. After studying the AI deployment step by step in the literature survey, we executed AI pilot project deployment step by step by selecting a small pilot area a compliance high voltage testing of the finished product before sending to the customer for improving the cycle time of the testing process at the electrical power product manufacturing company. The pilot project has resulted in benefits like AI improves the overall productivity, trust in the process, traceability of product based on real-time captured data and lead time of total process to improve customer satisfaction exceptionally. We concluded this study with the main goal of AI is to deploy software that can analyse the input and give the required output. AI provides man-like communication with software and helps in decision-making for a given task, but AI is not a man replacement.

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A CONCEPTUAL STUDY OF THE SUPPLY CHAIN MANAGEMENT 4.0 IMPLEMENTATION PROCESS

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Abstract

Today the supply chain has evolved tremendously from a fixed job of a bridge between sales and production functions with a focus on raw material supply to product manufacturing lines and finish goods dispatch to the final consumer to an independent function with a separate hierarchy. The SCM focus has adopted the upgraded planning methods such as integrated S&OP and outsourced logistics. Further, the world has seen continuous wealth shift towards the rural areas over the past few years and the online product purchase is rapidly increasing due to the buyer's trust in communication transparency and easy much option access. To adapt to these trends SCM requires being faster, granular, and precise.

The Supply chain efficiency can be increased by up-gradation with new technology and eliminating the waste in the process. We studied the step by step SCM 4.0 implementation process to achieve the SCM 4.0 application benefits like global inventory and lead time reduction with the help of digitized material planning, order fulfilment, and forecast accuracy. We have analyzed the key six value SCM 4.0 enablers as improvement levers that will generate a change in capital cost, manufacturing agility, and service are planning, physical flow, performance management, order management, collaboration, and strategy.

Further, We carried a pilot study on SCM 4.0 implementation with current state mapping of value chain identified the wastage like manual data capturing, manual planning based on gut filling, low service levels, and high inventory that can be prevented or eliminated by the effective SCM 4.0 application. Also, We noted that SCM 4.0 deployment face some problems like training needs and skilled talent, senior leadership involvement, change management, and small and medium business needs tailor-made solutions.

Keywords: SCM 4.0, Cloud, Digitization, Digital Waste, Big-Data.

Introduction

Today the supply chain had evolved tremendously from a fixed job of a bridge between sales and production functions with a focus on raw material supply to product manufacturing lines and finish goods dispatch to the final consumer to an independent function with a separate hierarchy. The SCM focus has adopted the upgraded planning methods such as integrated S&OP and outsourced logistics. Further, the world has seen continuous wealth shift towards the rural areas over the past few years and the online product purchase is rapidly increasing due to the buyer's trust in communication transparency and easy much option access. To adapt to these trends SCM requires being faster, granular, and precise [1].

A. Definition of Supply Chain 4.0

SCM 4.0 model is the integration of IoT, AI, and big data analytics by deploying the sensor, network, automation, and data analysis tools in every process for improvement in consumer satisfaction [2]. It is explained in the following figure1.

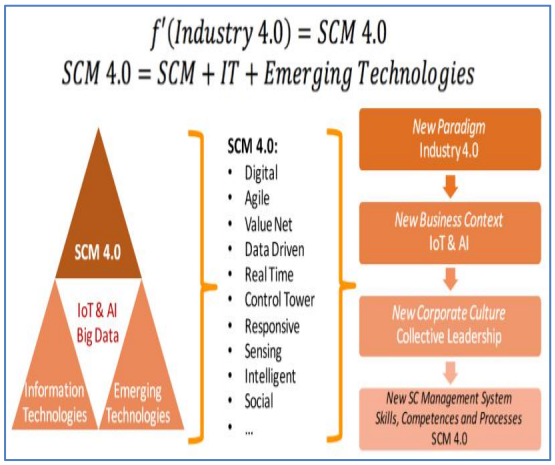

Figure1: SCM 4.0 model [3]

B. Objectives of the Research

To study the SCM 4.0 concept and its stepwise implementation with the pilot study.

Literature Review

SCM 4.0 Step by Step Implementation Process

The Supply chain efficiency can be increased by

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up-gradation with new technology and eliminating the waste in the process. Following figure2 explains the step by step SCM 4.0 implementation process to achieve the SCM 4.0 application benefits like global inventory and lead time reduction with the help of digitized material planning, order fulfilment, and forecast accuracy. It also explains the SCM 4.0 implementation model starting from data cloud SIOP in the current state to the digital value network in the final state.

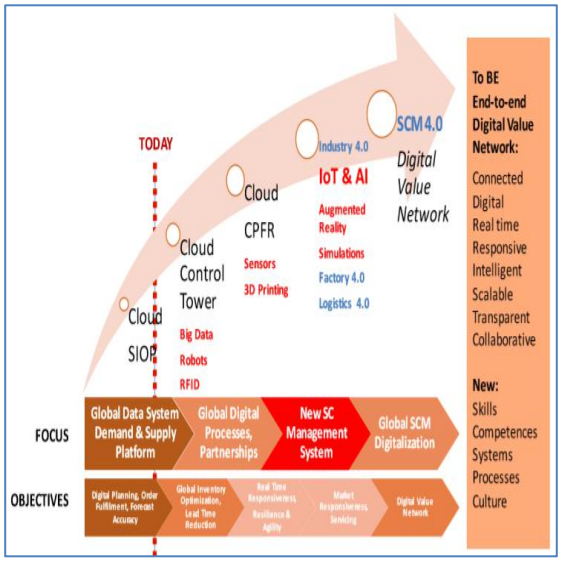

Figure 2: SCM 4.0 Implementation Model [3]

We further break the SCM 4.0 implementation process into an organization vision that defines the objectives of the implementation and improvement layers that explain the sequence of the implementation process as below,

A. SCM 4.0 Vision

1. Faster process: Forecasts are started to carry out on a weekly basis and for the high runner products daily basis. Amazon patent of "Predictive shipping" means products are dispatched before the order is placed by the customer. The order is matched later that dispatched product and the shipment is sent to the customer who ordered that product which reduces the lead time of the delivery process drastically.
2. Flexible: Real-time production planning helps by reducing the planning frequency and frozen period, a quick reaction to dynamic demand. The supply chain may be hired as a by-usage basis paid service instead in-house. The service provider's specialization helps them to generate scale economies as well as outsourcing business.
3. Granular: Customized product demand is increasing rapidly. Micro-segmentation ideas will be able to execute these demands. Customers are managed in granular clusters and within scope of his requirement of the products. Drone delivery helps the business to execute the last high-value products very efficiently.
4. Accurate: The upgraded performance management process allows real-time data of main KPIs like service level, granular data of process parameters such as the truck's location. Clean-sheet models are used in digital performance management systems for setting automatic targets, identifying problems, and mitigating them [4].
5. Efficient: Efficiency in the supply chain is raised by automation of the material handling by robots at the warehouse. Autonomous trucks usage idea application for cross-company logistics [1].
6. Digitization of the supply chain: The supply chain digitization needs capability and internal environment. It means we required integration of the supply chain process with IT with rigid infrastructure with the skilled executives to drive this innovation. Figure3 explains the supply chain digitization process.

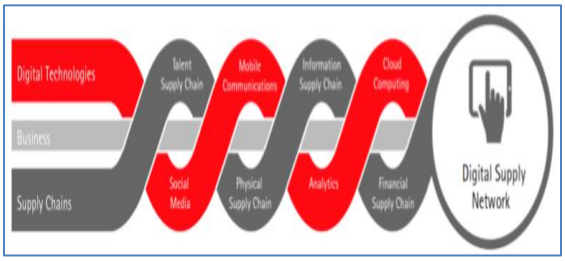

Figure 3: The Supply Chain Digitization [3]

B. SCM 4.0 Improvement Levers

SCM 4.0 will influence all the areas of supply chain management. We structured the key six value enablers as improvement levers that will generate a change in capital cost, manufacturing agility, and service as below [1],

a. Planning: The big data, upgraded analytics, and knowledge work automation are going to drive future SCM. The block chain collects and shares the big data within the supply chain recently [5]. It is a shared ledger management of the data which gives facility of having same data at different stations for usage of the many departments [6]. The Data will be either with an open access or with controlled logins to enter in the network. The data contain information like product mix, lead time of individual products, and allocate this as a block within a continuous block chain which is linking to the same continuous transaction [7]. Predictive data analytics study's many internal

and external issues like weather, sensor data, and current social trends that affect the demand planning with machine learning approaches to fix a precise and granular plan. These technologies are preventing errors in demand forecasting by 30 to 40 percent. Also, this latest mathematics gives the probability of the demand forecast quantity rather than a single number. Completely automated closed-loop demand and supply planning convert planning function into a continuous and flexible process. Closed-loop planning helps to integrate pricing and planning that depends on the stock inventory's, probable demand, and replenishment capability, where prices can be adapted as per changing demand to raise the profit and reduce the inventories.

b. Physical flow: The logistic function is going to upgrade with good connectivity, upgraded data analytics, 3D printing, and better automation. 3-D printing improves inventory control strategies and autonomous vehicles improve productivity in the warehouses. The smart machines with features like voice, touch, and graph driven interfaces give user experience. This helps the warehouse linkage with the production loading work stations with no manual interference. Smart vehicles reduce the operating cost of product handling and lead times reduction.

c. Performance management: The real-time data from internal and external sources drive the KPI in performance management. The performance management process is now able to realize the root causes of non-conformances by automatic calibration or by data collection, big data analyses, and machine learning. The machine will start counteractions automatically based on the root-cause identified, such as triggering a replenishment order or changing safety stocks.

d. Order management: No-touch processing and actual-time proactive planning are the two main types in order management that help to reduce costs by work automation. No-touch processing is the further step to an available-to-promise (ATP) with pre-available master data. Real-time planning makes the supply chain structure up to date and driving to dependable planning data.

e. Collaboration: Supply chain clouds are data centers for vendors, companies, and customer providing an integrated planning option with collaboration. This improves the cost invested and errors involved due to communications by 25 percent on overall logistic efficiency [8]."

f. Supply chain strategy: The micro-segmentation of the supply chain based on customer needs and owns capacity formed in an ever-changing and big data drive customized the supply chain to optimize inventory.

Methodology

A. Pilot Study on SCM 4.0 Implementation

1. Current end to end value stream mapping: We started with the mapping of current end to end value stream map to capture total lead time of the product delivery to the customer from the time he ordered the goods as explained in the Figure 4.

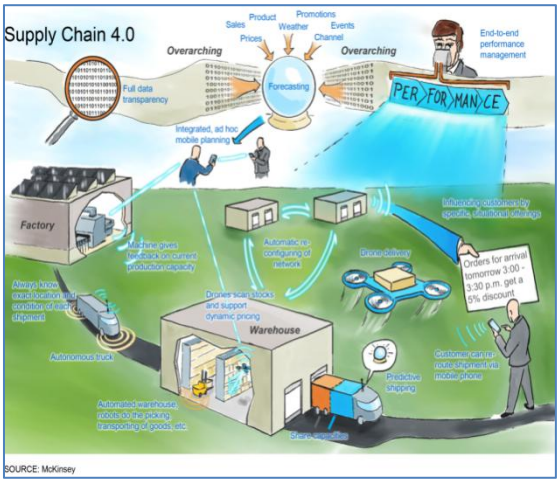

Figure 4: Current Value Stream Map Example [1]

2. Identify the waste: We identified the following main types of digital waste in the value stream,
   a. Data capturing and control: Data collection is paper-based and not regularly updated e.g., vendor lead time master data is entered one time and does not change for years. Also, warehousing receives notifications of the advance shipping but hardly uses this data to control the inbound logistics.
   b. Integrated process optimization: Many organizations have initiated to deploy an integrated process of material planning, but many times data of statistical forecast is overwritten manually by respective planners which have a significantly bad impact on the accuracy of the forecasting.
   c. Physical process execution: Current SCM is many a time executed based on planners gut feeling, but not supported with the real-time data, e.g., to standardize milk run paths in the warehouse. Also, the warehouse is working in one to two hours batch sizes, but not executes the new real-time orders and continuously changing routings.
   d. Low service level or sales: Low service level is due to high lead times, wrong

product stocks, and an unreliable products delivery.

e. Supply chain costs: Logistic, storage, and the network setup cost can be reduced by up to 30 percent by deploying clean sheet advance calculations with minimum touch locations and travel distance. The remaining cost saving can be achieved by supporting dynamic routing approach, transport offloading, autonomous vehicles, and 3D printing.
f. Supply chain planning: Advanced system automates the 80 to 90 percent of planning tasks with good quality. The S&OP will be executed with weekly frequency and real-time that will drive the system automatically rather than planner manual intervention.
g. Inventory: The safety stock is maintained in the current system. The other main inventory driving mechanism is the raw material replenishment lead time. Also, high transport lead time, e.g., from the USA to Asia.
h. Logistic: We need a smart vehicle with container which is capable to know material content details inside it and its current location and past history. This will improve the traceability of the material within short lead time [9].

C. Some Problems for SCM 4.0 Deployment

We find out some problems for SCM 4.0 deployment while studying the concept as mentioned below,

a. Training needs and skilled talent: SCM 4.0 application and sustenance require skilled talent and training to all the stakeholders.
b. Senior leadership involvement: Senior leadership involvement required from start to end for budget approval, decision making, and follow up over timeline of the project.
c. Change management: The change from manual to automated activity requires good change management that covers shop floor training, timely completion of allocated tasks, and sustenance.
d. Small and medium business needs: Small and medium businesses may adapt with tailor-made SCM 4.0 as per their requirement.
e. Visualization of integrated actual and digital supply chain value stream and identifying precise waste is difficult and skillful work [10].

Conclusion

SCM 4.0 model is the integration of IoT, AI, and big data analytics by deploying sensors, networks, automation, and data analysis tools in every process for improvement in consumer satisfaction. The Supply chain efficiency can be increased by up-gradation with new technology and eliminating the waste in the process. SCM 4.0 results in a faster, granular, precise, flexible, efficient, and digitized process. The key six value SCM 4.0 enablers as improvement levers that will generate a change in capital cost, manufacturing agility, and service are planning, physical flow, performance management, order management, collaboration, and strategy. Further, Pilot study on SCM 4.0 implementation with current state mapping of value chain identified the wastage like manual data capturing, manual planning based on gut filling, low service levels, and high inventory that can be prevented or eliminated by the effective SCM 4.0 application. SCM 4.0 deployment also face some problems like training needs and skilled talent, senior leadership involvement, change management, and small and medium business needs tailor-made solutions.

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A case study on the DMAIC Six Sigma application to prevent injuries in the manufacturing industry

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Abstract: Ever growing rivalry and non-standard customer requirements triggered a continuous improvement need at goods manufacturing. The injury at workstations to the operators increases the actual lead time of the delivery to the final customer. This paper works on the DMAIC Six Sigma applications to reduce the injury due to burr formation while hammering in the tractor transmission manufacturing. We applied hypothesis testing, DOE, and Z test ANOVA to check the two variables relation with each other and effects of improvement actions over the process at the workstations. We applied cause and effect diagram and matrix, and FMEA that given 15 probable input variables X for the improvement. We applied the improvement actions over these X's and verified the process capability that found Ok. Finally, we reduced total injury from 2 to 0 no's/month against the target of the 0 incidents and RPN reduced from 343 to 96.

Keywords: DMAIC; Six Sigma; process capability; ANOVA; FMEA.

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1 Introduction

1.1 Six Sigma approach need

Ever growing rivalry and non-standard customer requirements triggered a continuous improvement need in goods and services. The injury at workstations to the operators increase the actual lead time of the delivery to the final customer and cost (Slack et al.,

2010). During 1986–2001 Motorola extricate 800 billion rupees [Eckes, 2001; Hendricks and Kelbaugh, (1998), pp.48–53] by the application of Six Sigma technique. Similarly, 3M, GE, and Honeywell also received a big cost savings in their operations by the application of Six Sigma technique [GE Annual Report, 2002; Honeywell Annual Report, 2002; Arndt, (2004), pp.62–74; 3M Annual Report, 2003]. Six Sigma is the most effective and efficient among the techniques like Business reengineering, TQM, and Lean [Bailey et al., (2001), pp.1–3]. Hence, a business gets main gain of lead time reduction, cost-saving, and defects prevention (Stamatis, 2004; Breyfogle III et al., 2001; Pyzdek and Keller, 2010; Dale et al., 2007). DMAIC is a tool used for improvement in the manufacturing process by application of the Six Sigma [Garza-Reyes et al., (2010), pp.92–100]. We used DMAIC jointly with other tools such as the Fishbone diagram, Pareto analysis, FMEA, DOE, and ANOVA for the application of this empirical study for injury reduction in the selected workstation.

1.2 Definition

One may define Six Sigma (6σ) as a combination of many tools for continuous improvement in the given manufacturing process. In the year 1986, an American engineer Bill Smith had started it at Motorola [Tennant, (2001), p.6]. GE under leadership of Jack Welch, in 1995 prepared Six Sigma as their main business strategy. A six sigma supposed to produce a 3.4 DPMO that is defects per million opportunities (Stamatis, 2004; Knowledgehut, 2020). The manufacturing process performance and its variance are Six Sigma key explanations (Brue and Howes, 2006). Six Sigma is an organisation strategy to go for lower cost and continuous improvement for every kind of process.

2 Literature review

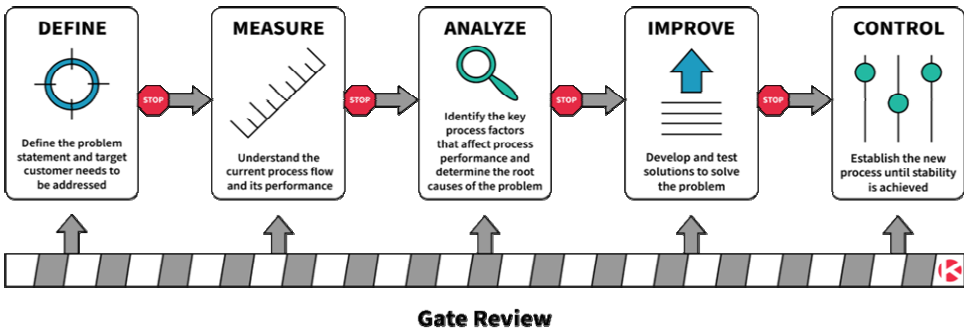
2.1 DMAIC significance

DMAIC is equivalent to PDCA technique of Deming's (1993). The DMAIC guides with a step by step approach for problem-solving (Bezerra et al., 2010). Thus, DMAIC allows the systematic and standard execution guide by working on standardised problem-solving process [Hammer and Goding, (2001), pp.58–63]. DMAIC is centred on the collection of the data, brainstorming on collected data and improvement action plan over it (Pyzdek, 2003). DMAIC's allows an actual fact and data based decision-making instead of the previous experience [Garza-Reyes et al., (2010), pp.92–100; Drmahey, 2018]. This can be also used in the process problem solving at purchase, human resource, and logistics along with manufacturing.

2.2 DMAIC step by step guide

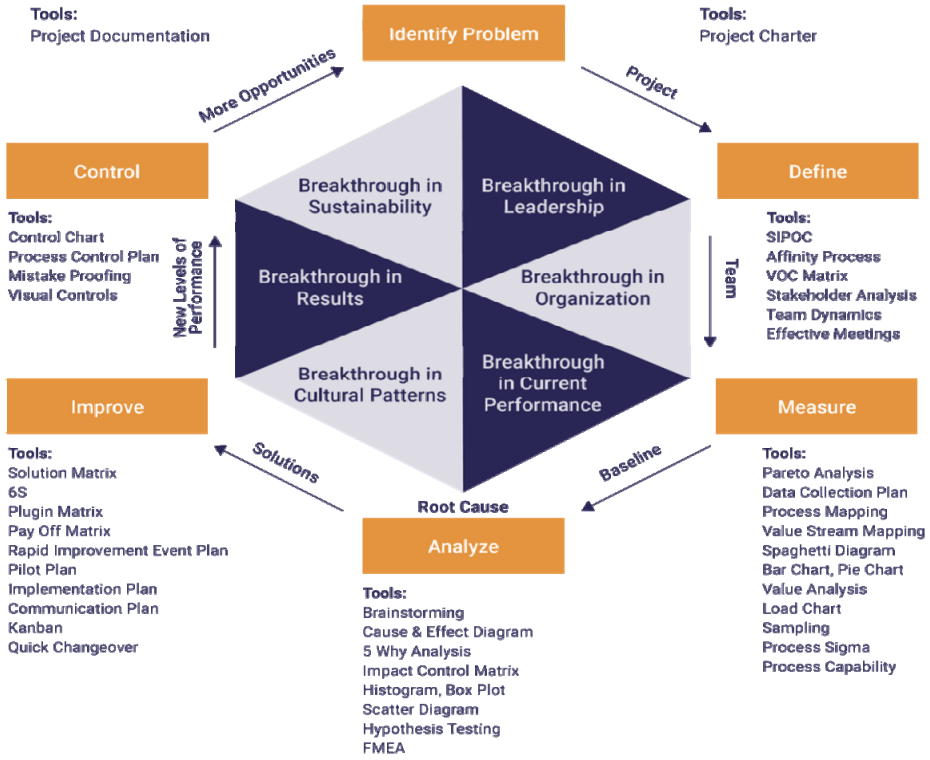
DMAIC technique is detail five stages define, measure, analyse, improve, and control (Tanner, 2020; Anderson, 2019] guide for problem solving and continuous improvements (Dale et al., 2007; Villanovau, 2020). The DMAIC in brief explained in Figure 1.

Figure 1 DMAIC technique (see online version for colours)



Source: Kanbanzone (2020)

Figure 2 DMAIC Six Sigma tools (see online version for colours)



Source: Defeo (2020)

1 *Define*: Define is the first step and it define the cross-functional team's responsibility with the fix timelines, project scope, and targets triggering the customer needs [Gijo et al., (2011), pp.1221–1234].

2 *Measure*: Measure is the second step that ticks the measurement methods we are going to use for the selected manufacturing process to be improved (Omachonu and Ross, 2004) and check the current performance of the process (Stamatis, 2004).

3 *Analyse*: Analysis is the third step determines the problems causes (Omachonu and Ross, 2004), problem why-why analysis, comparing with each other, and defining improvement chances (Adams et al., 2003).

4 *Improve*: Improve is the fourth step use and experiment the statistical methods to check possible improvements to prevent problems in the process (Omachonu and Ross, 2004; Sage Automation, 2017).

5 *Control*: Control is the fifth stage to sustain the improvement done (Omachonu and Ross, 2004) and controlling of the actual performance of the process (Corley, 2019).

Following Figure 2 explains the important tools used at each phase of the DMAIC.

3 Methodology

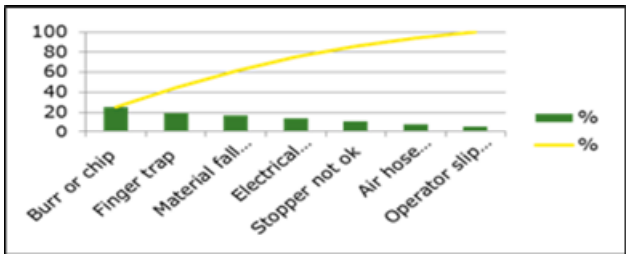
3.1 DMAIC Six Sigma application an empirical study

We have performed an empirical study of DMAIC six sigma applications at the tractor transmission manufacturing process as explained below in step by step manner.

3.2 Define

We plotted a Pareto chart for the all injury types' tractor transmission manufacturing for FY19-20 to understand the main injury occurred in the manufacturing process as shown in the Pareto Chart1 in Figure 3.

Figure 3 Pareto chart 1: total injury types contribution at the transmission in August–May 2020 (see online version for colours)



From the Pareto chart, we collected the top seven injury types which are contributing to 82% of the total injury in the transmission manufacturing process (Creately, 2020). We tracked these top seven injury's in the transmission manufacturing process as below:

1 burr and chip injury

2 finger trap injury

3 material fall on floor or slippage injury

4 electrical shock injury

5 stoppers not Ok injury

6 air hose leakage injury

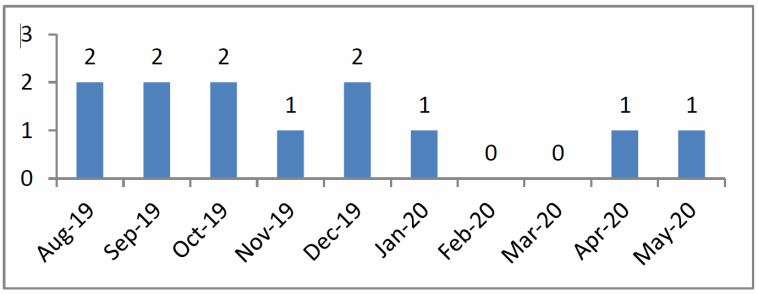
7 oil on floor or slippage injury.

We set our main scope to burr injury incidence reduction at the transmission tractor manufacturing by six sigma application from the above Pareto chart data. Further, we started the DMAIC Six Sigma with the in-process injury data collection (TQMI, 2017) in the year FY19-20 as explained in the Table 1.

Table 1 Tractor transmissions burr and chip injury contribution in FY19-20 (see online version for colours)

Which	business metric is not meeting target?	FAC, near miss, unsafe condition
Where	is the problem occurring?	Transmission assembly
When	was the problem first observed?	August 2019
Who	is affected by the problem?	Transmission Assembly employee safety
How much	is the business metric affected?	Burr and Chip injury happened 9 in FY 19, and 6 from November–May 2020
Problem statement		1. Transmission assembly using 21 hammer for assembly of roll pin for alignment, serial number punching, and crimping. 2. Two hard and brittle metal contact with uneven force creating chip or burr formation. 3. High speed burr from brittle hammer material causing deep penetration from clothes and skin puncture injury after heating with operator body. 4. This resulted in severe injury's to operators causing treatment at outside hospital.

Burr and chip injury at transmission assembly



3.2.1 Objective

We formed the following objective statement to answer the above listed injury incidents,

1 To identify the main injury incidents or issues in a tractor transmission production process and prevent it by the DMAIC Six Sigma application.

2 To reduce the risk priority number (RPN) in the hazard identification and risk assessment sheet HIRA of the tractor transmission manufacturing process.

Further, we prepared a project charter based on the above data to prevent these injuries. Project charter is a consolidation of the project scope, targets, and every cross functional team member's role with the fixed timeline (Pande et al., 2000). The detail project charter is mentioned in Table 2.

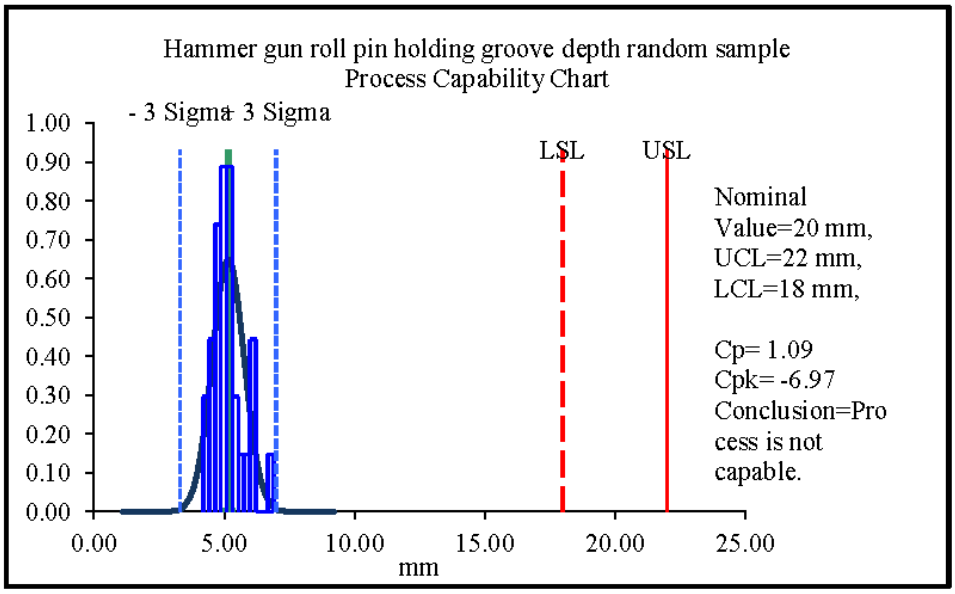
Table 2 Six Sigma project charter

Goal statement		*Reducing burr or chip injury to operator body by hammer elimination in transmission assembly*				
METRICS	*Type*	*Description*	*UOM*	*Current*	*Goal*	*% change*
	Business	Eliminating burr or chip injury to operator body	No	2/Month	0/Month	100
	Primary	Hammer elimination in transmission assembly	No	21	6	72
	Primary	HIRA RPN value reduction	No	343	96	66

3.3 Measure

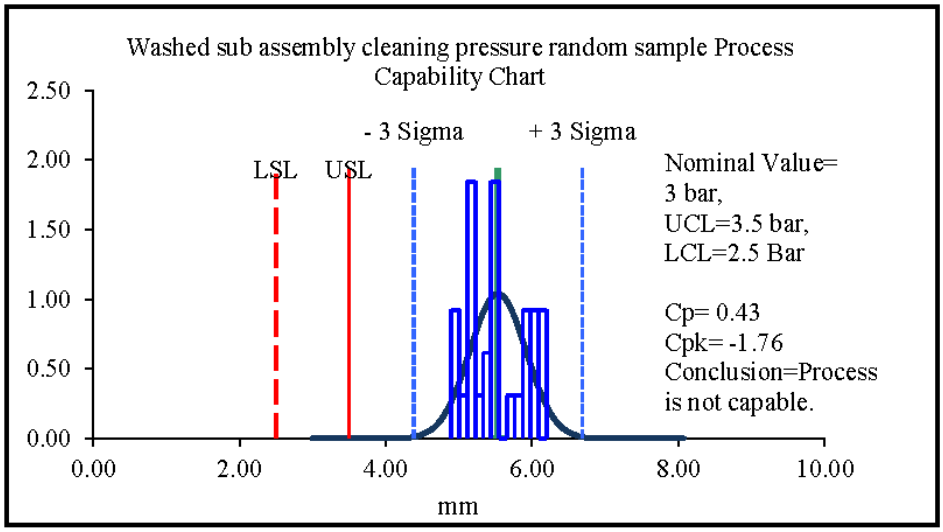
The measure is an actual fact based data collection stage to define baselines for selected process performance (Vcomply Editorial, 2017). These actual baselines compared current as well as with the after performance to check whether the actions are resulting in the improvement. We performed a process capability check to verify the process variation in the hammer gun roll pin holding groove depth as mentioned in Figure 4.

Figure 4 Process capability chart for hammer gun roll pin holding groove depth (see online version for colours)



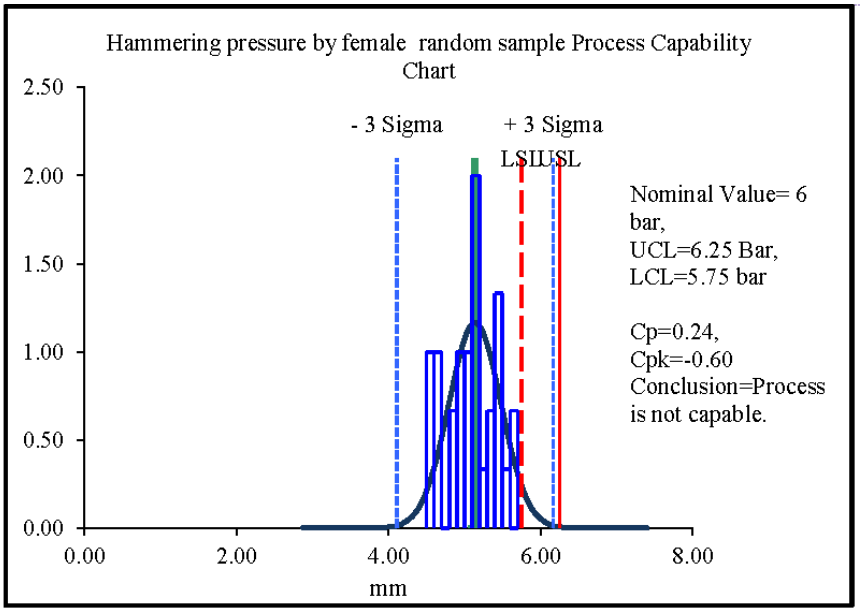
Next, we done process capability check for the washed sub assembly cleaning pressure as explained in Figure 5.

Figure 5 Process capability chart for washed sub assembly cleaning pressure (see online version for colours)



Finally, we performed process capability check for the hammering pressure by female as explained in Figure 6.

Figure 6 Process capability chart for hammering pressure by female (see online version for colours)

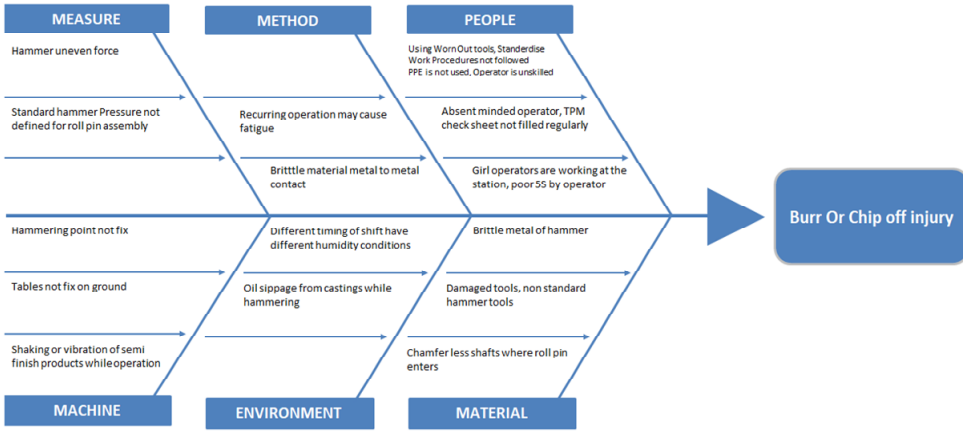


Process capability check study above explained that all the process capabilities are > 1.33 and need a significant improvement.

3.4 Analyse

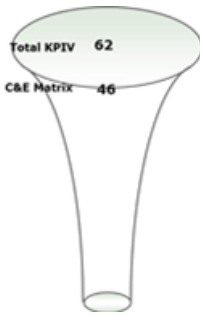
We performed cross functional team brainstorming with cause-and-effect diagrams, cause-and-effect matrix, and FMEA (Pyzdek, 2003) to verify, validate, and finalise the problem root cause (Henshall, 2017). We found probable root causes that is inputs X after the brainstorming with a cause-and-effect diagram over the burr and chip injury as shown in Figure 7.

Figure 7 Cause and effect diagram brainstorming on problem burr and chip injury (see online version for colours)



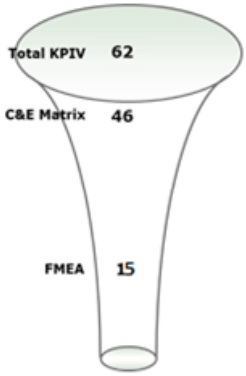
Next, we performed funnelling by cause and effect matrix on all the probable root causes as shown in Figure 8.

Figure 8 C&E probable root causes funnelling (see online version for colours)



We got total 57 probable input variables X and funnelled 46 out of 57 by the C&E matrix to perform FMEA over it. Next, we performed the FMEA to verify the system reliability as shown in Figure 9.

Figure 9 FMEA funneling of the probable root causes of the injuries (see online version for colours)



As explained in the Table 3 we found out 15 probable root causes or input X,

Table 3 Probable root causes or input X

Sr no	*Input variable*	*Effect*
X1	Roll pin holding while hammering	Roll pin slip, hammer slip, high speed burr creation, roll pin bulging.
X2	Two hard metal contact	High speed burr creation, roll pin bulging.
X3	High air pressure while cleaning on washing machine	High speed burr spread.
X4	Burr contact with body	Burr injury to body.
X5	Hole not matching of two components	Roll pin slip, hammer slip, high speed burr creation, roll pin bulging.
X6	Roll pin OD	Roll pin slip, hammer slip, high speed burr creation, roll pin bulging.
X7	Material of hammer wood	Hammer slip.
X8	Brand of hammer	Play in hammer, high wear and tear.
X9	Hammering force variation	Play in hammer results in wrong shot.
X10	Operator fatigue	Manual force variation.
X11	Hammer audit frequency	Hammer wear checking.
X12	TPM audit frequency	Fixtures, Pneumatic guns not Ok.
X13	5S audit frequency	Exact tools are not available.
X14	Operator gender	Hammering force variation.
X15	Operator state of mind	Hammering force variation.

3.5 Improve

The improve stage identify a solution to prevent probable input X (Omachonu and Ross, 2004; 6sigma, 2017). We pointed out, checked, and applied solutions over problems to stop the injury incidence. Stamatis (2004) guides the DOE a statistical tool used in the improve stage to check multiple input X effects (Roy, 2001; Antony and Kaye, 2000).

The DOE improves the performance of the process, reduces variation, and improve cost cutting (Montgomery, 2009). Therefore, we used the DOE on total of two input parameters to check whether the improvement actions are worth. A DOE tool ANOVA used for verifying means differences of more than two populations (Moore et al., 2009). We used the two-way ANOVA for two input factor effect verification (Moore et al., 2009). Figure 10 shows the F test ANOVA for checking hammering pressure variance by hammer gun used by female and male.

Figure 10 ANOVA F test (see online version for colours)

Null Hypothesis (Ho)	Hammering pressure variance by hammer gun, female, male are equal		
Alternate Hypothesis (Ha)	Hammering pressure variance by hammer gun, female, male are different		
Type of Test : F-test/ ANOVA	**Assumptions :**	**Normality**	**Randomness**	**Homogeneity**
		P-value -2.34 E-10	No	No

Statistical Results

One way ANOVA

Hammering Pressure by gun in bar	Hammering Pressure by Female in bar	Hammering Pressure by Male in bar	State Hypothesis	
6	5.2	5.6	H0-Group variance are equal	
6.05	4.7	5.9	H1-Group variance are different	
6.05	5.9	5.2		
6	4.6	6.7	Select Test	
6.05	5.4	7.2	Performing F test for variance	
6	5.6	5.6		
6.05	4.4	5.5	Level of significance=0.05	
5.95	4.9	5.9		
5.9	5.2	5.6	Extract relevant statistic	
5.95	5.6	5.9	VAR(Group A)=	0.002789744
5.94	5.1	6.5	VAR(Group B)=	0.185641026
6.05	4.9	6.2	VAR(Group C)=	0.307564103
6.05	5.2	5.7	Fmax	110.2481618
			dfl	12
			dfs	12
			Fcri	2.686637112
			Pvalue	2.344741E-10
			Decision	
			Since Fmax>Fcri (Pvalue<0.05), Accept H1	

Conclusion- There is a significant variation in hammering pressure by male, female, hammer gun analysis

From Figure 10, we concluded that there is a significant variation in hammering pressure by male, female, and hammer gun.

We further used the two-way ANOVA for two input factor effect verification (Moore et al., 2009). Figure 11 shows the F test ANOVA for checking gender effect on hammering pressure. From this study, we concluded that gender effects hammering pressure.

From Figure 11, we deployed following two key improvements at the manufacturing process:

1 Hammer is replaced by hammer gun to achieve constant pressure of hammering for preventing burr or chip off.

2 Deployment of boys only at hammer and girls or boys at hammer gun usage points.

We further carried out the after FMEA of the injury incidence at the transmission manufacturing process and got the below results as shown in Figure 12 where we identified 13 parameters checked by statistical test to validate the improvement actions results.

Figure 11 ANOVA Z test (see online version for colours)

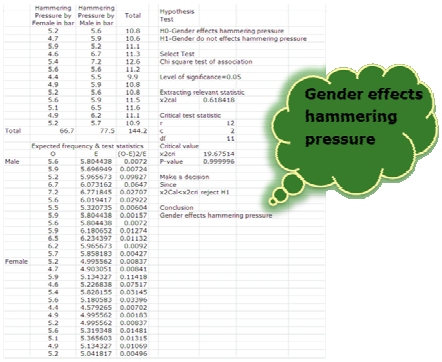
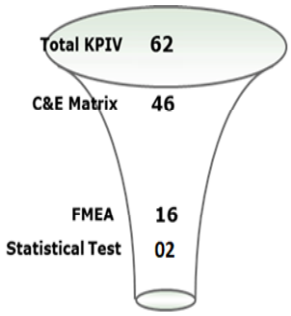
Null Hypothesis (Ho)	Gender effects hammering pressure			
Alternate Hypothesis (Ha)	Gender do not effects hammering pressure			
Type of Test : **Chi square test of association**/ ANOVA	**Assumptions :**	**Normality**	**Randomness**	**Homogeneity**
		P-value -0.99	No	No
Statistical Results				
Conclusion- Gender effects hammering pressure				

Figure 12 Funneling after statistical test (see online version for colours)

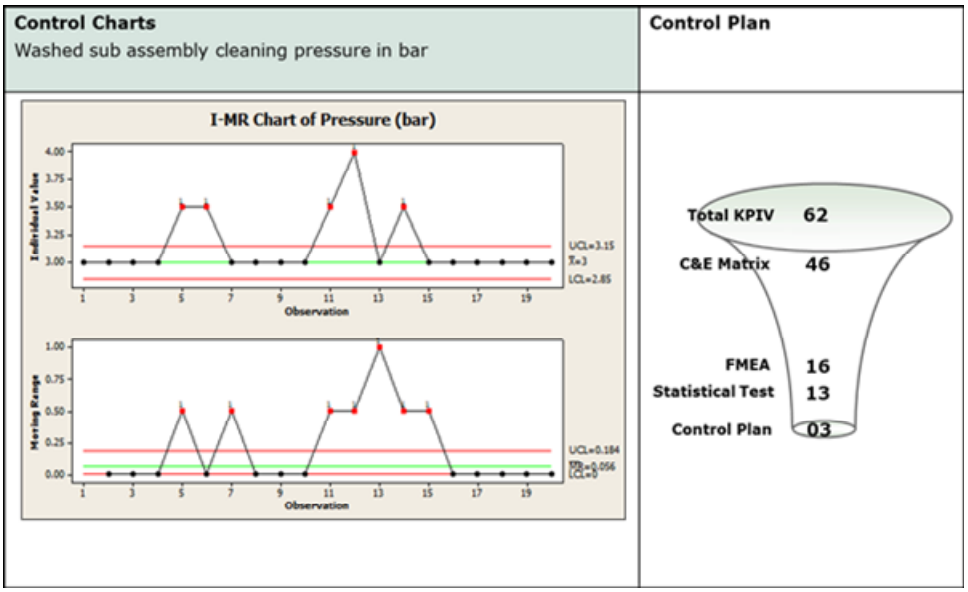


3.6 Control

We verified the sustenance of the improvements in the control stage by verifying the improvements (Rastogi, 2018). We applied the control chart I-MR at the washed sub assembly cleaning pressure as shown in Figure 13.

This helped us to verify the after improvements process stability (Omachonu and Ross, 2004; Stamatis, 2004) and to check process variations.

Figure 13 Control chart I-MR (see online version for colours)



3.7 Results

After deployment of all the improvement actions, we verified the process capability for the three input parameters X as shown in Figure 14, Figure 15, and Figure 16.

Figure 14 Process capability chart for hammer gun roll pin holding groove depth (see online version for colours)

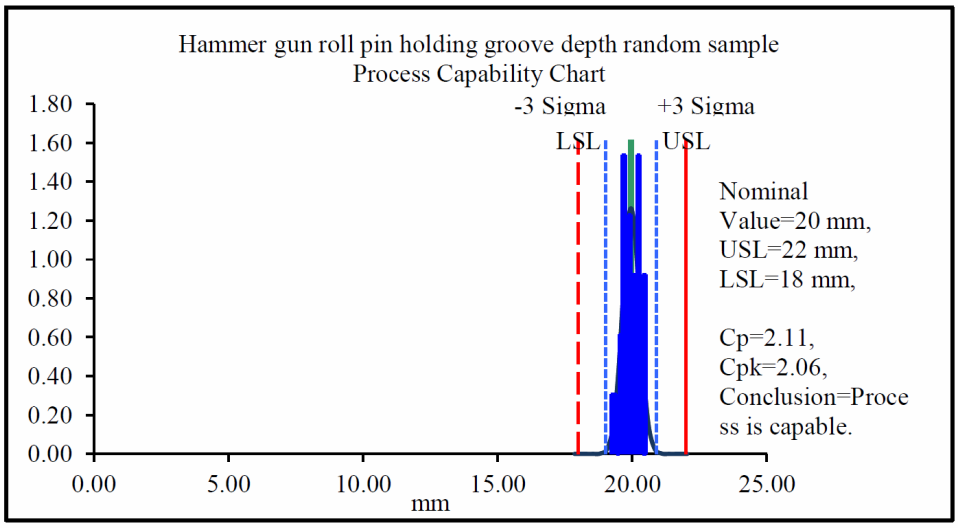


Figure 15 Process capability chart for washed sub assembly cleaning pressure (see online version for colours)

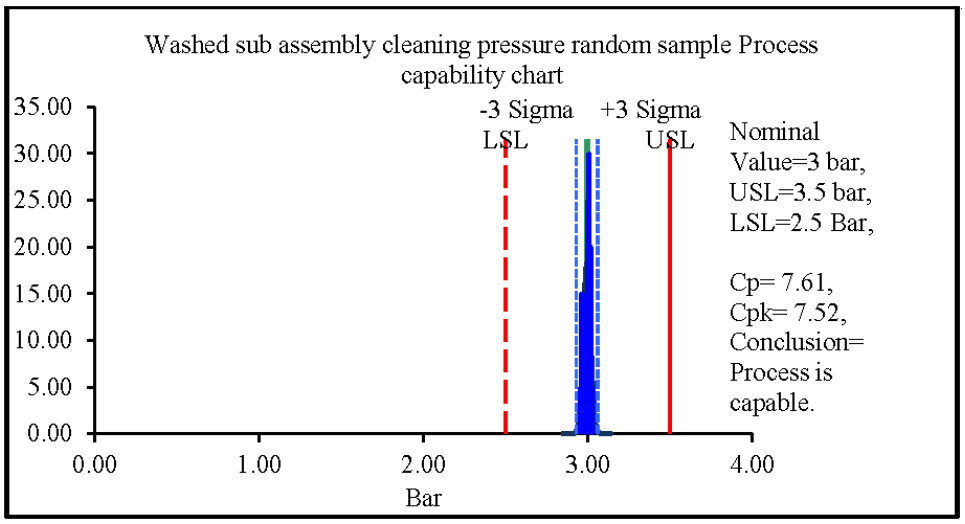
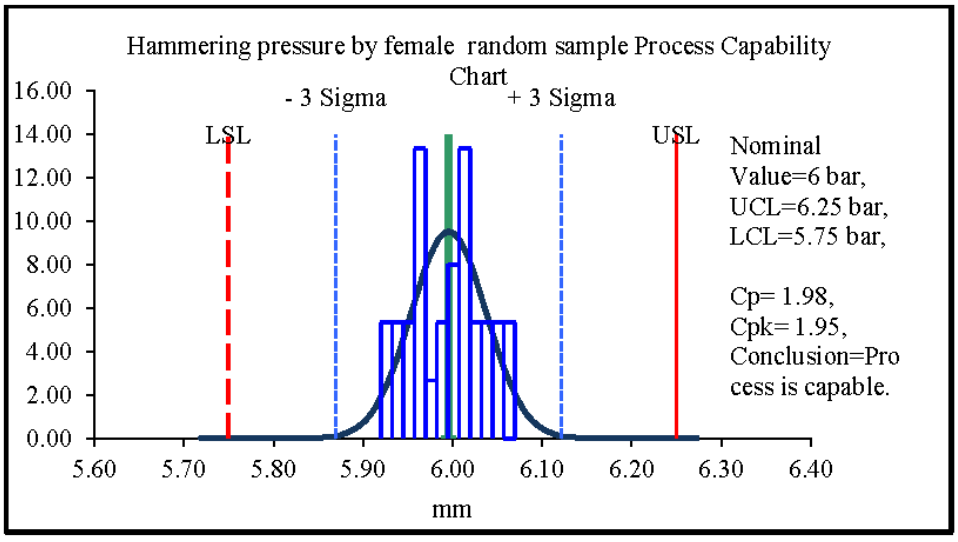


Figure 16 Process capability chart for hammering pressure (see online version for colours)



From Figure 16 process capability study, we concluded that all the improvement actions taken had reduced the injuries at manufacturing process.

Also, we plotted the number of hammer usage and RPN HIRA value reduction in Figure 17.

Figure 17 The number of hammer usage and RPN HIRA value reduction (see online version for colours)

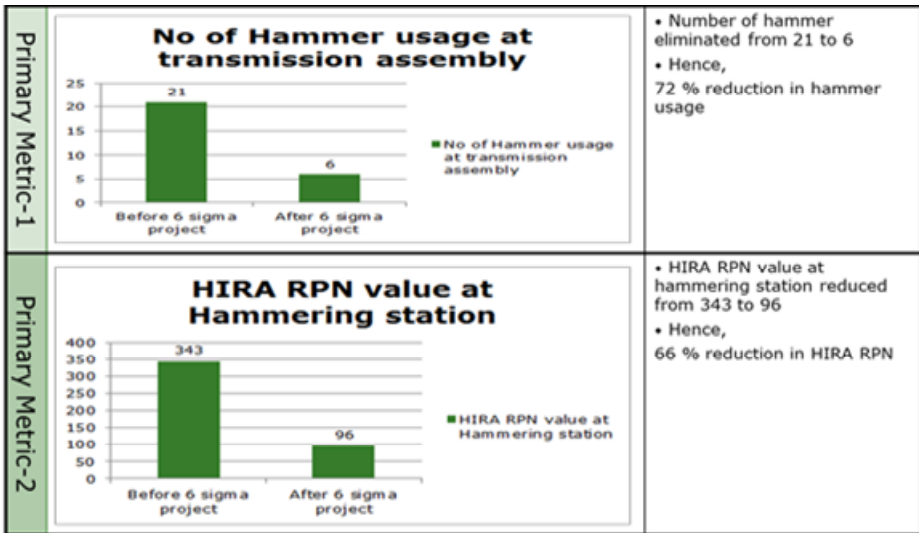
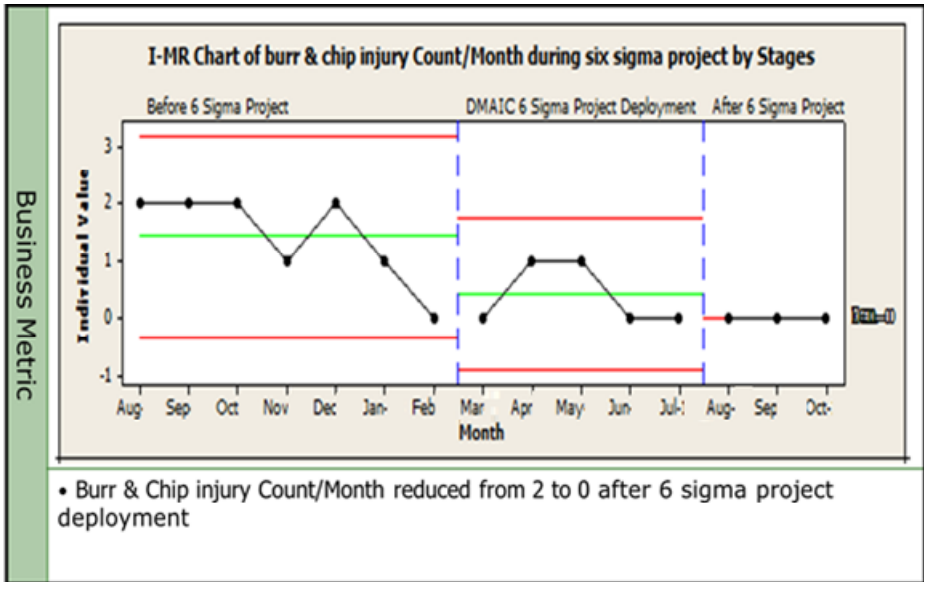


Figure 18 Burr and chip injury reduced from 2 to 0 per month (see online version for colours)



We concluded the final results of the DMAIC six sigma project application as below,

1 We reduced total number of hammers from 21 to 06 on manufacturing assembly line.

2 We reduced RPN of HIRA from 343 to 96 at hammering work station.

3 Burr and chip injury reduced from 2 to 0 per month.

4 Conclusions

The research papers unique contribution application of the DMAIC six sigma tools to verify the probable root causes of injury incidents, improvements over it, and tracking the improvement actions sustenance. We deployed the hypothesis testing, DOE, and ANOVA tools to check the two variables co relations and effects of the improvement actions. We found out the top seven injuries contributing 82% of the total injuries. We applied cause and effect diagram with the cross functional team, cause and effect matrix, and FMEA to find out the 15 probable input variables X. We applied the improvement actions over these input X variables and verified the process capability after improvement actions implementation which is found Ok. Finally, we reduced total burr and chip injury from 2 to 0 per month, hammer application points reduced from 21 to 06 numbers locations, and hammer workstation RPN of HIRA reduced from 343 to 96 as per our project charter objectives. We applied the theory of DMAIC six sigma techniques to reduce the overall safety incidence at manufacturing industry that may guide the managers to improve their workplace safety.

This research has limitations of parallel implementation of same actions at the other manufacturing industry. The managers may understand this case study and find the actions appropriate at their work place in future.

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A Study of need of Artificial Intelligence in Project Management Practices with emphasis on Risk Management and Analysis for efficient execution of Projects

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Abstract

Projects are new beginnings in many ways. Whether it is the launch of a new car or development of new software, product, it needs planning, design, execution, and monitoring before the final product is delivered.

Project management is the science and art of sequencing and stringing all these activities together into a coherent whole to ensure that the final delivery meets the desired specifications. Every complex project comes with its own problems and challenges, and good project management practices help overcome them.

Project management is like juggling three balls (cost, time, quality) simultaneously as it involves maintaining a fine balance between delivering on time, within budget while ensuring quality.

Project Management is associated with varied perspectives of Risk identification, Risk analysis, risk management and aspects of management, comprising legal concerns, project management, Technology management, supplier management, cost management etc. All these aspects are all indispensable elements for success of projects.

In the R&D projects, Project and Risk Management has become a topic of frequent discussion in recent time. Although it is agreed both in theory and in practice that the Risk Management is essential, it is still a challenge to identify the issues associated with identification of internal and external Risks, such as motivation, benefits and costs, selection process and implementation.

This research aims to analyse the knowledge level of the project managers in the Project management process and project risks management and investigated of results and conclusions drawn from the analyses to be used for further research. It also aims the reason for formulation of Artificial Intelligence based framework into Project Management Practices with emphasis on Risk Management and Analysis for efficient execution of R&D Projects

Keywords: - Risk Management, Project Management, Technology management, supplier management, cost management, budget, Artificial Intelligence

1.0 Introduction

The worldwide industry is often characterised by major delays in development and delivery of large R&D programmes. Suppliers often suffer financial losses and reputational damage as a result of underestimating project risks.

This research investigates the knowledge level of project and risk management practices of the project managers and application of risk management principles and behaviour required for project teams for execution of projects.

Risks in R&D activities in various industry are an important topic today, considering the fierce competition coinciding with globalization. Getting the R&D task done within cost and time schedule is an increasingly common way for firms to survive in the business considering the right mix of internal and external risks. The current problem is not only of identifying a suitable risk, but more important is how to do risk analysis and mitigation to reduce the overall negative impact on the project.

Programmes such as the aerospace/IT industry initiative have created several opportunities to participate in high-profile programmes. There are, however, several project-specific risks that should be taken into account when exploring new business opportunities, R&D activities or continuing to do business in this environment. A lack of understanding of these specific risks often leads to project failure with resultant overspending, late deliveries and loss of credibility as a supplier.

Although a lot of research has been done on risk management in general and also on the R&D programmes, this investigation will provide insight into the specific knowledge levels associated with projects and the results of the investigation could be useful to upcoming projects of industries.

Various R&D projects are very nature complex endeavours that usually involve a high level of risk and uncertainty. It is often said about R&D projects: "Risk cannot be avoided, but must be managed."

The root causes average knowledge level of project risk management in industry need to be identified and investigated and results and conclusions drawn from the analyses can used to make recommendations and actions for execution of R&D projects.

This research paper will be extremely useful for project managers and project team members as it may enable to:-

- Understand the process requirements of project risk management
- Supply guidelines for the risk identification and analysis

- Identify ways for risk mitigation
- Identify the need of AI into Project Management Practices especially for Risk Management

2.0 Problem Statement

Various new R&D projects towards development of critical sensors, new technologies, systems used are being initiated on large scale. However during project design, implementation phases, how much important is given to project management, Risk analysis and management is a key question, hence study of same is important to understand the basic knowledge of project management and risk management.

3.0 Objectives

- To study the relevant literature on project management, risk and project risk management with specific emphasis on the application of risk management
- To investigate the knowledge levels of project teams working at R&D industry regarding the application of project risk management principles and processes.
- To investigate the opinions of project team members regarding the quality of project risk management as applied in R&D projects
- To investigate the attitudes of project team members regarding the application of project risk management in R&D projects
- To identify areas for improvement in project risk management in R&D projects

4.0 Hypothesis

The motivation for this research is based on the hypothesis that there is significant scope for improvement in project risk management.

5.0 Purpose of the research

The main purpose of this research was to determine the knowledge levels of project managers in project management and project risk management in R&D projects.

The following components were analysed with respect to Project Managers

- Knowledge and experience of project managers with respect to project management and risk management practices
- Level of compliance with risk management principles and procedures

- Attitudes of project teams at industry regarding project management and risk management practices

6.0 Need for research in this field

The knowledge level of the project managers in the Project management process and project risks management need to be identified and investigated and results and conclusions drawn from the analyses to be used as a basis for recommendations on how to improve the project management and risk management process in R&D projects.

7.0 Research design procedure

The research procedure included a study of the relevant literature to obtain a better understanding of the theory and application of risk management principles in projects.

Quantitative research methods: Quantitative research methods involve either identifying the characteristics of an observed phenomenon or exploring possible correlations among two or more phenomena. Descriptive research examines a situation as it is. It does not involve changing or modifying the situation under investigation nor is it intended to determine cause and effect relationships.

Qualitative research methods: Qualitative research methods focussed on phenomena that occur in the "real world" in all the complexity. Qualitative researchers recognise that the issue has many dimensions and layers to portray the issue in its multifaceted form.

This research included both qualitative and quantitative research. The research project focused on three target groups, namely: senior management, project and programme managers and project team members.

Quantitative research was conducted in the form of a questionnaire from which the results were statistically analysed using exploratory statistics; the results are represented graphically with the aid of graphs and pie charts.

The qualitative research consisted of personal one-on-one interviews with current project managers, senior managers and other project personnel.

Systematic review, the methodology applied in this research, is one kind of literature review but different from traditional review.

8.0 Deciding on the data requirements

Sample population

The population used for this study consisted of employees from the R&D project environments and was aimed at various sections and management levels.

Sample size

A simple random selection methodology was used in inviting respondents to participate in the survey. The objective was to randomly invite people from the project environment to participate and to ensure a representative response from all organisational levels and various sections. Questionnaires were distributed to randomly selected respondents within the various sections of the R&D centre.

9.0 Survey Questionnaire

Following guidelines were used as design criteria for the development of the survey questionnaire for this study.

- Keep it short.
- Use simple, clear, unambiguous language.
- Check for unwanted assumptions implicit in your questions.
- Check for consistency.
- Keep the respondent's task simple.
- Provide clear instructions.
- Give a rationale for any items whose purpose may be unclear.
- Make the questionnaire attractive and professional looking.

10.0 Preliminary considerations

The following considerations were taken into account before formulating the questions:

- What information is required?
- Who are the target respondents?
- What data collection methods will be used to survey these respondents?
- What analytical methods will be used to interpret the results?

11.0 Structure of the questionnaire

The structure of the questionnaire was aligned with the objectives of the research as indicated below.

- The first section of the questionnaire called for demographic data about the respondent's age, experience, qualifications, membership of professional organisations and experience of project management and project risk management. This section of the questionnaire was aimed at obtaining data to determine whether demographic and experience variables had any influence. A second objective was to determine whether the sample criteria were met w.r.t representation and experience.
- Theoretical questions included in the second section of the questionnaire were aimed at determining the knowledge level of respondents regarding project management.
- The second section of the questionnaire was aimed at determining the respondent's perception(s) of the quality of and compliance with risk management principles. This section included subsections on the following:
    - Project management
    - Project risk management
    - Project risk planning
    - Project risk identification
    - Project risk analysis
    - Project risk prioritisation
    - Project risk monitoring and control
    - Project risk resolution
- General project risk management questions
- Attitudinal questions
- Care was taken to ensure that questions were not constructed in ways that gave clues about preferred or more desirable responses. The pre-test was done after consensus had been reached on the format and content of the survey form.

12.0 Processing received responses

The results of all returned questionnaires were captured in an database. The database was developed in parallel with the survey questionnaire in order to determine whether the responses

would satisfy the data requirements of the research process as well as comply with the format for the presentation of findings and conclusions.

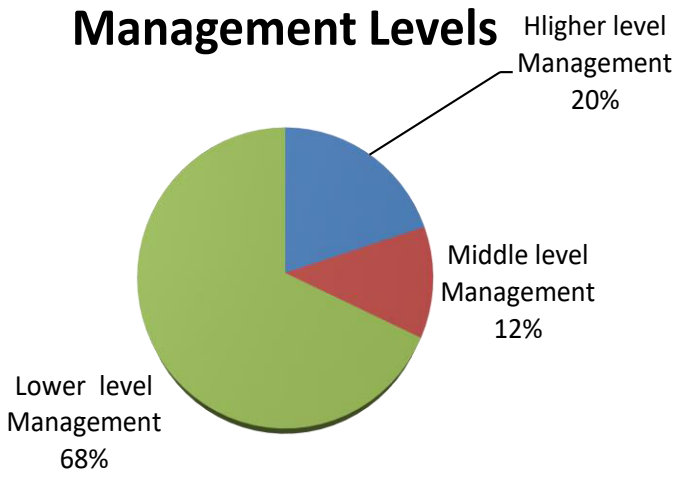
13.0 Statistical analysis of the data

Responses were analysed using the software package. Responses were analysed as per management level.

14.0 Result, Discussion of Results and Findings

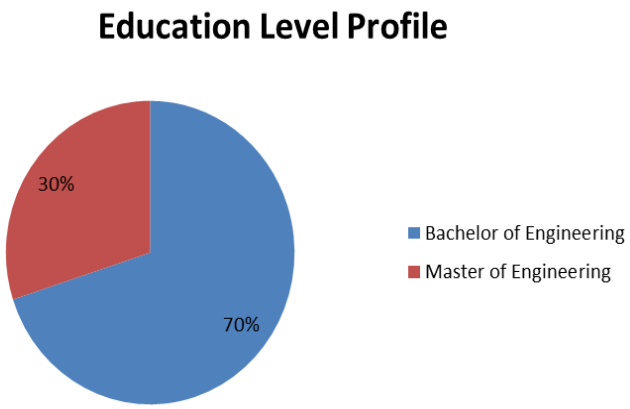
14.1 Respondent Profile

Break Down of Respondents as per Management Level



The respondents were a highly experienced group at various management levels

14.2 Respondent Education Level Profile



The respondents were a group of well-qualified people, most of whom held engineering and other technical qualifications.

14.3 Respondents' membership of professional organisations

Majority of the respondents are currently members of professional bodies and the organisations in their fields.

14.4 Respondent Project and Project Risk Management Training

Most of the respondents have completed formal project management risk and risk management training

14.5 Summary of the results for all project management questions

The overall result for project management knowledge level questions was very good. Higher Level Management, Middle Level Management and Lower Level Management all were having very good project management knowledge.

14.6 Summary of the Project Risk Management questions

The overall result for project risk management knowledge level questions was good. Higher Level Management, Middle Level Management and Lower Level Management all were having good risk management knowledge.

14.7 Summary of Risk Management in R&D Projects

The overall result for project risk management knowledge level questions was found to be average. Higher Level Management, Middle Level Management and Lower Level Management all were having average knowledge in risk in R&D projects.

15.0 Conclusion

Overall findings, analysis and discussions correlate with the research design and satisfy the stated goal, objectives and hypothesis.

16.0 Recommendations

The following recommendations are made for future research:

- A detailed investigation into project risk management process within various R&D centres, industries and global R&D Centres
- Further investigation for the future role of Artificial Intelligence solutions as the natural next step in aiding the organization to manage project and risk management successfully.
- Formulation of Artificial Intelligence based framework into Project Management Practices with emphasis on Risk Management and Analysis for efficient execution of R&D Projects

17.0 References:

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INSTITUTE FOR ENGINEERING RESEARCH AND PUBLICATION IFERP

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Entrepreneurship as a Career Choice in Hospitality Industry

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Abstract- Several career opportunities are available to hospitality graduates in current business environment. In the light of this context, entrepreneurship is also a growing career choice in the hospitality industry. In-depth research and investigation is required to understand the antecedents of entrepreneurial intention. With this thought in mind, this research study aims to (a) study the motivations of hospitality students to become entrepreneurs and (b) review the role of educational institutions in promoting entrepreneurship as a career choice. A total of 98 questionnaire responses were gathered from hospitality students. The same were analysed using percentage method. Results and findings show that there is an inclination towards hospitality entrepreneurship among students with a high desire and passion. The role of institutions is encouraging entrepreneurship behaviour and further mentorship in certain areas is warranted. The study identifies the important factors related to the research problem and offers relevant suggestions and critical points of discussion.

Keywords – Entrepreneurship education, entrepreneurial intention, career choices, hospitality and tourism entrepreneurship

I. INTRODUCTION

Tourism industry contributes to nation's GDP tremendously and is an active catalyst in boosting employment as well as socio-economic welfare of the country. Hospitality and tourism industry is well known for its international growth. In India, tourism industry's share in jobs is 12.95% and to the GDP is 5% (Ministry of Tourism, 2021). This industry actively and passively touches several ancillary industries and has been a growing phenomenon in education world as well. Several world class dedicated hospitality and tourism institutions are popular on a global level that are churning out industry veterans.

On the other hand, number of graduating students every year is a high turnout. There are 1047 degree awarding universities and 41935 colleges in India as per UGC. In 2018, 64.74 lakh students graduated out of these institutions (University Grants Commission, 2019).This makes it important to study and comprehend the career choices that the youth of the nation is making because this will determine the future of the workforce.

The entrepreneurship movement has become a game changer for business as well as education spheres. It has brought about ground breaking modifications and innovations globally. Its promising future scope has made entrepreneurship a key pillar of national policies as well. Entrepreneurship has seeped into education too. While its impacts are still nascent and yet to be fully unlocked, it is necessary to research on its linkage to career choices. In the hospitality sector, certain unsaid career path guidelines are followed however things are changing with the advent of entrepreneurship. There has always been a debate that whether entrepreneurs are made or born and it is interesting to continue it. This study propagates to understand that how sources of

entrepreneurial career choices are a blend of several factors that are tangible and intangible to the individual, coming from their personal, social, economic, political, technological and demographic tangents.

Identification of Research Problem

Tourism and hospitality education has grown robustly in the recent decades. However, several challenges revolve around the hospitality pedagogy that make it difficult to transition graduating students into entrepreneurship. This coupled with other challenges in the landscape, add to the research problem. In most cases, students are trained to become job seekers and not job creators which limits their scope to explore entrepreneurship as an active career choice. This tends to develop a mind set in students to work for others and in organisations as opposed to being self-reliant through self-employment opportunities. This creates a challenge at the placement level also because of the discrepancies in demand and supply levels. Additionally, the current societal and educational setup, tends to view entrepreneurship as a last resort of career choices, which needs to be reviewed. A significant challenge is also posed by the existing hospitality course modules that have limited involvement of entrepreneurship knowledge. The curriculum is rooted to train working in large hospitality organisations and rarely teaches students on how to start their own ventures. India is ranked 47th for entrepreneurial employee activity. A kaleidoscopic view of entrepreneurship is not adequate for students to make a career choice and it needs to be imbibed deeply in the course curriculum. Currently, entrepreneurial education is an addition to the existing core modules. It is added as a supplementary layer or an elective subject, hence it does not get the justice it deserves as an integral module. Most business management education is about running an existing business and not about starting a new venture, which is important to learn, especially in hospitality. This directly impacts the career choices of the students. In fact, core entrepreneurship education is known to have a higher influence for developing entrepreneurs (Pandit et al., 2018).

Entrepreneurship intent among the youth of the country has risen from 20.6% to 33.3% in 2019-20 (Global Entrepreneurship Monitor, 2021), which does indicate a growth. This data is not limited to hospitality industry, hence it is also important to understand the intention favourability for this sector in particular. At the same time, the fear of business failure is at 62% which is an alarming indicator of the risk taking willingness among the individuals. The GEM data shows high regard towards entrepreneurship being a career choice in African region. 42% of European business schools in a study have also made an attempt to move towards an entrepreneurial economy (Sánchez, 2013). There is a pressing need to understand this in the Indian context (Pandit et al., 2018).

As understood that hospitality entrepreneurship is growing and it is essential to research deeper into this context, this article will discuss the perspectives of two stakeholders (students and educational institutions) in making entrepreneurship a career choice in this industry. The following section reviews literature on the related concepts, followed by discussion on the research methodology and primary data results. The last section offers the discussion, concluding remarks and scope for future research in this domain.

The two primary aims and objectives of this study are:

i. To study the motivations of hospitality students to become entrepreneurs.
ii. To review the role of educational institutions in promoting entrepreneurship as a career choice.

II. LITERATURE REVIEW

It is important to understand certain elements of the research topic from an academic perspective to get a deeper understanding of past research in the domain. The motivating factors, antecedents and motives are the primary drivers that can influence a graduating student to choose entrepreneurship as a career and it is important that these are studied in detail. Recent years have seen the developing interest in not only learning how career choice translates to a decision or behaviour but also what factors lead to forming this career choice (Fayolle & Gailly, 2015). It is intriguing to study entrepreneurial intent in student groups because it offers a view on the reasons that instil an inclination towards entrepreneurial behaviour at a nascent stage. Personality traits, attitude and institution environment can be key drivers of this behaviour (Zollo et al., 2017). A few other factors and concepts that are vital to this process are also discussed below.

Entrepreneurial Intention

When reviewing entrepreneurship as a career choice, an important terminology that must be understood, is **entrepreneurial intent**. Intention would refer to the willingness and deliberate efforts that an individual is wanting to invest in a behaviour. The inclination towards a behaviour (Kautonen et al., 2013) and the mental preparedness to pursue an act, i.e. entrepreneurship adds to the intent (Virick et al., 2015). Therefore, use of intention models to study the conversion of planned behaviour is most appropriate in understanding the conscious choice of choosing entrepreneurship. This phenomena is best rooted in the academic concept, the **theory of planned behaviour** by Ajzen. Past research has delved into the concept of entrepreneurial intention as well. In the research article of (Gurel et al., 2010) the role of innovation, risk taking capacity and individual traits as influencing elements in entrepreneurial intention development is discussed.

It can also be critically argued that intentions may or may not turn into behaviour (Kautonen et al., 2015). In the context of this study, it must be understood that if a student has entrepreneurial intentions at the initial periods of his/her hospitality course; then towards the end of it, i.e. by the time of placements, has their initial intention increased, reduced or stayed the same. If at all it has changed, what aspects of the course and university experiences may have led to it, must be studied. The preparedness of an individual to get into entrepreneurship is also influenced by certain aspects and the opportunity and timing of making this decision.

Factors Contributing to Entrepreneurship Behaviour

In context of the **push and pull factors** for entrepreneurship, the multiple factors do not impact individually, rather they work at the same time. At a certain time, a person is regularly and simultaneously impacted by several factors that are internal and external to them, i.e. present in their environment, attitude, self and mind. Hence, their combined impact influences the decision choices. The pull factors tend to be more extrinsic whereas the push motivations are more intrinsic to the individual. Researchers have identified certain pull factors like profitable business idea, lucrative business environment, market opportunity, autonomous working lifestyle and push factors like dissatisfaction in current work, lack of employment opportunities, pressure to work in a specific role, community inspiration etc. (Van Ness et al., 2020; Virick et al., 2015). Some individuals may believe that they will have an improved work life balance by being self-employed in their own venture. Independence and autonomous working can also be the reasons that individuals choose entrepreneurship, however they may have to face hindrances of long hours, business risks, lack of expertise and multiple responsibilities (Andringa et al., 2016).

The **entrepreneurship event model** suggests that a favourable perspective towards a behaviour will make an individual decide in the favour of acting upon it, thereby making it important to ensure that aspiring entrepreneurs have a positive image of the process of entrepreneurship (N. H. Ahmad et al., 2019). This could be done through methods like 'taster' entrepreneurship courses or short term live experiences of start-up operations that allows them to experience their career choice before they act upon it.

Social capital is another factor that drives the enterprising intention since it reduces transaction costs, allows gathering knowledge and acts as a guiding light. This coupled with a creative personality trait can be convincing for entrepreneurship behaviour. It is critical to identify these sources of social capital, which are tangible and intangible. The highest source for a student can be the university he/she attends, primarily because they tend to spend most of their time there and also base their career decisions from their experiences and interactions therein. The **social learning theory** also propagates the role of society in

shaping career choices which is very relevant in the collectivist configuration of India. Another research has theorised on the **social cognitive theory's** aspect in understanding how environmental factors and personal cognitive aspects interact to form entrepreneurial intentions. Their model included intrinsic needs, cognitive beliefs, and demography as personal factors; tourism market, industry and local modifications as environmental factors (Wang et al., 2019). Creative individuals feel they are suitable for innovating business ideas and create novice products for the market. In hospitality domain, there is immense scope for innovation and novelty, which should be used effectively to promote entrepreneurship. Hospitality and tourism industry has fairly low entry barriers, thereby making it easy for entrepreneurs to enter this segment (S. Z. Ahmad & Muhammad Arif, 2016).

A role model also plays a vital role in inspiring an individual to choose entrepreneurship as a career choice. The role model could be anyone, such as a friend, family member, relatives or any other entrepreneur. A budding entrepreneur will be comforted by two sets of networks that can be encouraging in nature, i.e. a moral support network and a professional support network (Hisrich et al., 2017). Bridging social capital is seen as the one where networking is enhanced between different circles and bonding social capital is the strength of the ties with family members and friends, and both are necessary for an individual, especially because social capital is positively associated to entrepreneurial career (Ip et al., 2018).

Education is one of the key antecedents of entrepreneurship choice. Imparting appropriate education can create or discourage entrepreneurs and this linkage has been widely studied in research. As an extension, the role of institutions who provide this education also becomes prime in this landscape of creating entrepreneurs (Turker & Selcuk, 2009). Entrepreneurship education and the overall impression towards entrepreneurship in the university campus contributes to an image formation about it. Guerrero and Urbanos's **entrepreneurship university model** discusses the role of university and factors in its setup contributing to student entrepreneurship. Certain university related factors include entrepreneurship encouragement by institution, institution's attitude towards entrepreneurship, role of teachers and staff, physical infrastructure, financial support, association with start-up industry, extracurricular activities, teaching materials and coaching programs (Mukesh & Rajasekharan Pillai K., 2020). Entrepreneurship education and courses have garnered popularity in recent teaching curriculums and models. Focused courses are becoming a part of higher education. Entrepreneurial education juggles between teaching *about* entrepreneurship (theories, history, concepts, and case studies) and teaching as well as preparing *for* entrepreneurship (live examples, internships, processes to start a venture, feasibility studies etc.).

Career

Da Palma et al., 2018 theorise that a person's work or profession could be viewed by them as a job, in which case financial rewards could be the prime focus; or career wherein the individual feels personally invested and involved and is willing to make efforts to grow and develop themselves in this career path; as a calling is when the individual feels that their work is inseparable from their own self. As far as the career related understanding is concerned, it is interesting to note that career path and growth are usually associated with working in structured organisations and hierarchical systems, thus, also making it complex to view entrepreneurship as a career choice due to the limited scope of an organisational development.

Changes have occurred in the domain of career and career management as well. Hierarchical structures, stability in business environment, mutual benefits to employee and organisation etc., were known to be traits of a career. However, rapid changes have led to a more agile and innovative approach. Stability of employment is uncertain and has given rise to entrepreneurial careers. Job security is one of the key differentiating factors between traditional careers and entrepreneurial careers. Until sometime, career and organisation were seen as synonymous rather than distinct elements of professional growth. Career growth in maximum of two organisations with more emphasis on extrinsic rewards is a **traditional career redux**, which can be attributed to earlier generations. With demographic changes, aspirations in career management have also changed. Family structures, working lifestyles, economic growth, socio-cultural changes, globalisation and organisational restructuring has also contributed to the changes in career models. Career models have evolved to be individual oriented as compared to organisation oriented. The **theory of career choice** suggests that an individual seeks an alignment between self and occupation (Costa et al., 2016). In this light, entrepreneurship and self-employment have become a new career choice. **New Venture Creation** is one of the most significant aspects of entrepreneurship process and inextricably linked to it (Donaldson et al., 2021). The **career construction theory** categorises the career in five stages of growth, exploration,

establishment, management and decline. Entrepreneurial intentions may develop at the first two stages and can be strengthened from thereon.

Having understood these important academic concepts of career, entrepreneurial intention antecedents for both, the research conducts a primary study and offers the results in the forthcoming sections.

III. MATERIALS & METHODS

For this study, the researchers used a combination of primary and secondary data. Different sources of primary and secondary data that were used:

Primary Data

The questionnaire method was used to gather an understanding of entrepreneurial intent and role of institutions in developing the same. A questionnaire was designed with two segments, i.e. first to gather demographic data from the respondents and second to ask questions in relation to entrepreneurial intent, motivation to choose entrepreneurship as a career, entrepreneurship education, role of university etc. Questionnaire method allows reaching multiple respondents at one time. The responses can be analysed and represented in quantitative terms. This method of primary data collection was the most appropriate one in this study and would facilitate in fulfilling the research objectives as well.

Likert scale was used to devise the questionnaire which enables to measure the attitude of respondents for each statement posed to them. This in turn facilitates in empirically understanding and testing the responses. It is an easy to use method of scale measurement and is also very effective in research studies (Kothari, 2004).

The respondent group chosen for the same comprised hospitality undergraduate students who were in their second, third or final year of the course. A total of 98 complete responses were received and processed further for data analysis. The chosen set of respondents is ideal for the research problem as students will be able to opine first-hand information in this regard. The diversity in terms of their academic years would allow getting multiple perspectives on course content, placement aspirations and temporal aspects of entrepreneurial intentions.

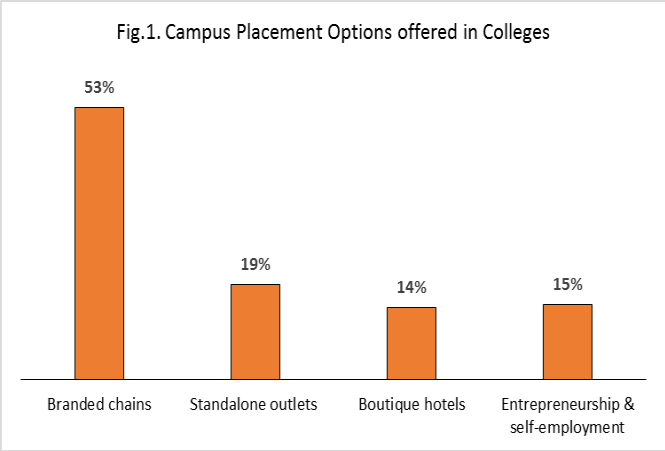
Secondary Data

Secondary data included academic concepts, industry knowledge and practices and statistics which were sourced from journal articles, books, industry reports, global agency reports and government websites.

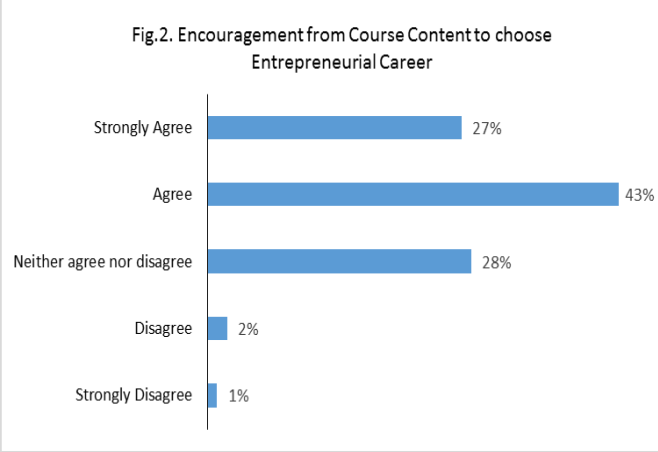
Post the data collection, data was analysed and processed for consistency and completeness. The data was visually represented through graphs and charts and inferences were drawn from this data. Statistical measures were used wherever relevant to validate and completely comprehend the data. Results and findings of the data are discussed in the next segment.

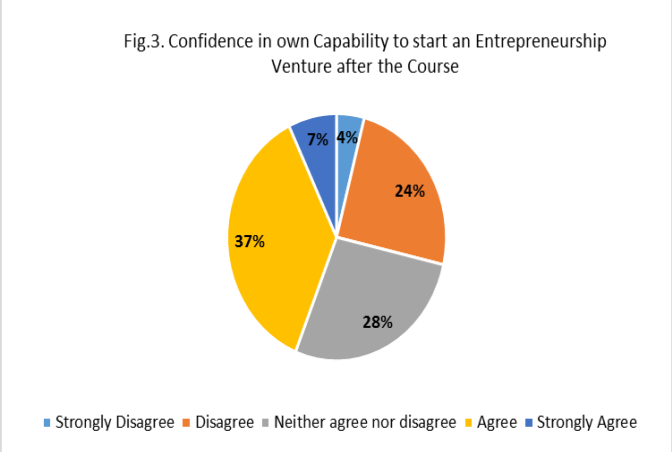
IV. RESULTS & DISCUSSION

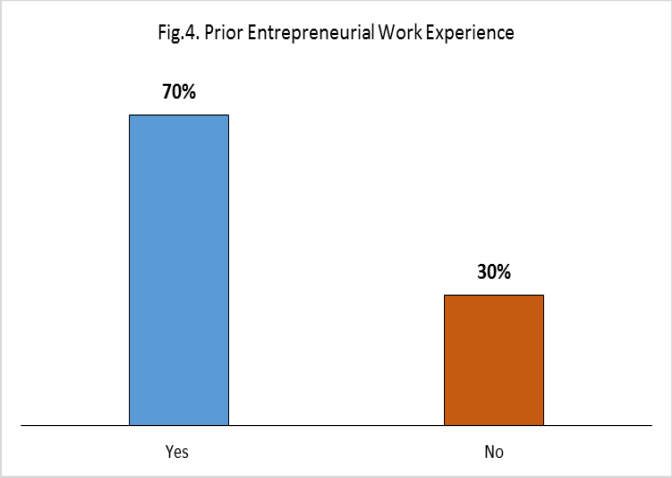
The results and findings of the primary data collection through questionnaire are shown below. Graphs are used to represent the responses to the questions.

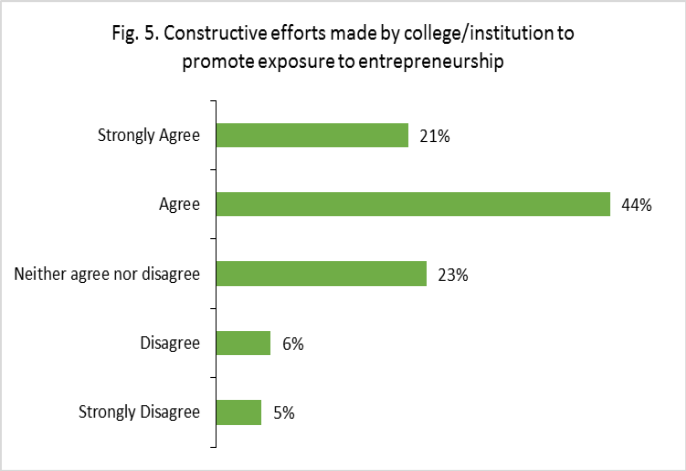


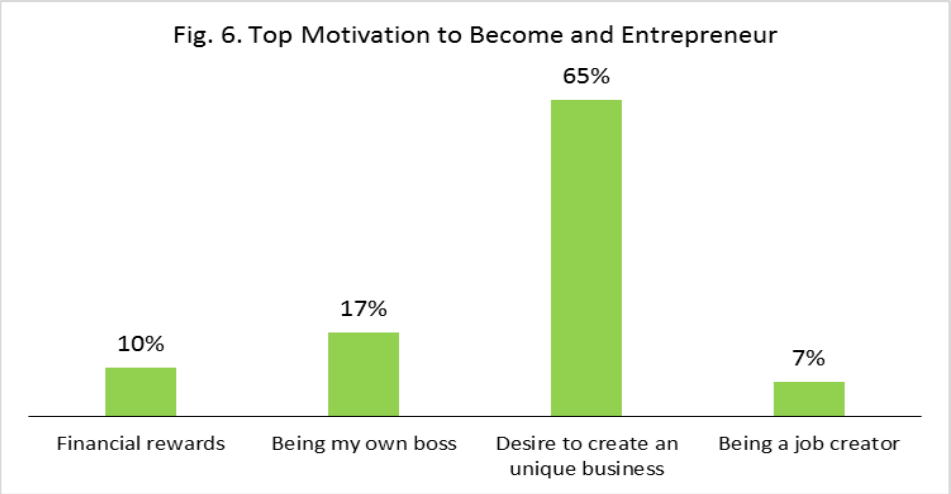
Most Preferred Career Choice	Ranks
Work in a global branded hospitality chain	1
Start an entrepreneurship business of my own	2
Work in a standalone establishment	3
Work in an existing entrepreneurship venture	4
Join the family business	5

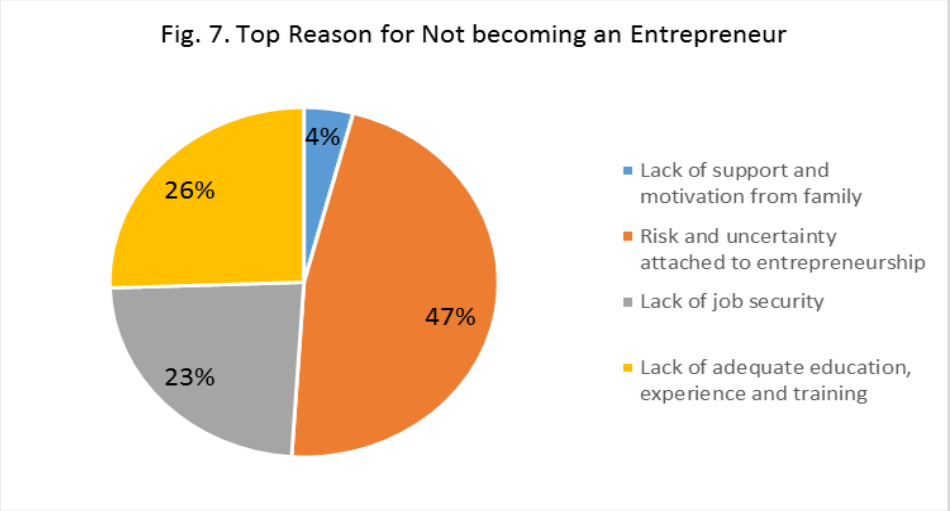


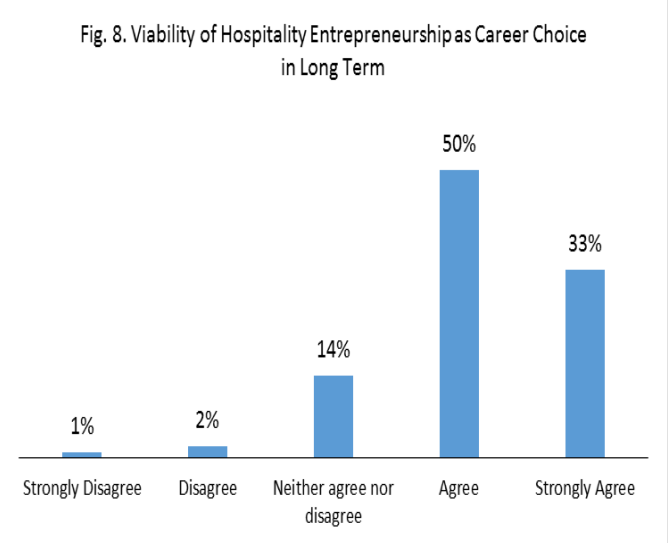












Aspects that can be modified to enhance entrepreneurial attitude	Ranks
Development of personal traits and risk taking capacity	1
Encouraging internship and placement in entrepreneurial ventures	2
Changes in course content and teaching material	3
Shadow training/internship with an individual hospitality entrepreneur	4
Faculty training on delivering entrepreneurship modules	5

The overall findings of the questionnaire indicate that students are willing and aspirational to engage into entrepreneurship careers, however certain roadblocks are recognised. At first, the perspective of entrepreneurship being a very risk-intensive option is still high among students and though business risks cannot be reduced, students can be taught to be more competent to handle risks. Working in global branded chains continues to be seen as a safer and secure employment opportunity. Secondly, the opportunities offered to student at campus placements for entrepreneurial experiences can be made more favourable. Currently, branded chains continue to dominate the campus placement options offered to students, being at 53%. Students feel driven by their course and their passion to create unique business models, however their confidence in doing so is not very strong. This means that there is high drive and passion in the students but facilitating and channelling this passion through constructive measures needs attention.

The desire to create unique businesses is the highest (65%) which suggests that students want to be unique business creators. Contrariwise, being a job creator and financial rewards are not top motivating reasons for these students, thus it can be noted that they are more market-centric in their business operations outlook. They are keen to offer unique products in the market whereas are not as focused on offering jobs. Support and motivation from family is not a challenging and concern area. The family support is well discussed in the literature review and hence the fact that it is not a hindrance for entrepreneurial aspirants, it can act as a motivator.

Concerns of lack of job security and limited training are present. Even though, 70% respondents have had prior training experience, 26% of them are hindered in their motivation to create a venture due to this.

83% of the respondents are in agreement of hospitality entrepreneurship being a promising career choice in the long run. This is a positive indication and shows the stickiness of the students towards entrepreneurship career choice.

Students are encouraged by their course content. To build an entrepreneurial attitude, respondents believe that enhancing risk taking capacity and personality cultivation is most necessary which is in line with the requirement of providing entrepreneurship specific training.

In the study, the prime antecedents that have an influence on the entrepreneurial intent for hospitality students is reviewed and understood. Multidisciplinary approach of understanding theories from other academic fields has enhanced this investigation. The following model in Figure 9 represents the factors that motivate and shape the intention of a hospitality student to choose entrepreneurship as a career choice.

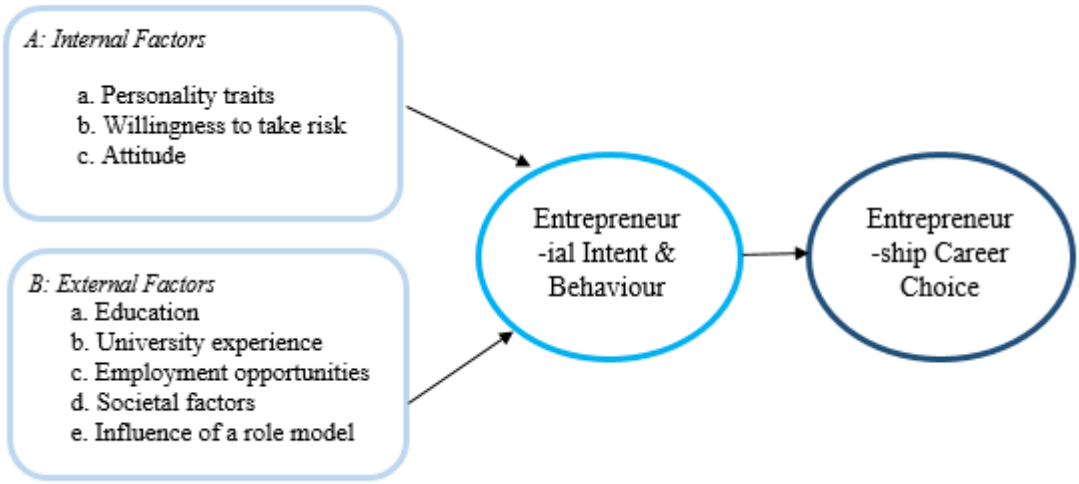


Fig. 9. Factors Shaping Entrepreneurial Intention and Career Choice

It can be noted that the factors are grouped under two categories, A and B. Factors in group A are those factors that are intrinsic/internal to the individual themselves. The basic intent and inclination to choose entrepreneurship is itself a key antecedent of it being a career choice. Personality traits include the individual qualities, skills and interpersonal behaviour of the individual. Attitude would comprise the attitude of the student towards hospitality entrepreneurship. Several other factors play a role in moulding the attitude and personality traits as well, which are currently not discussed in the scope of the research.

Entrepreneurs need to take calculated risks in personal and business level decisions and this is something that needs to be taught (Kuratko, 2005). Even though risk taking capacity is a personal trait, there are ways in which the educational course can modify the perspective on risk handling and management. Very few courses entail managing and handling risks. At first, the idea of portraying organisational jobs as more secure ones needs to change because that is the very first step in making students accepting of risks in their career. Once they are confident to take risks, they will be able to cascade this trait to their venture too. Hospitality industry is characterised by the dynamic and situation-handling trait, once individuals are adept at handling that, they will be able to walk towards a path of handling greater responsibilities. The primary data responses also suggests that the uncertain nature of entrepreneurship business may discourage students.

Those factors that are clubbed in the group B are the ones that are present in the larger external environment, such as university / college / institution / society / community / business environment etc. These factors will have an extrinsic impact on shaping the entrepreneurial inclination.

While it comes to aspects of education, it must be understood that entrepreneurship and business management education are not one and the same. Entrepreneurship education must comprehensively and robustly include business entry procedures and then move on to its survival and growth. Along with this, personal skill building of decision making, negotiation, leadership, innovation and management are also significant. Even higher level education needs to view this distinction between business and entrepreneurship education. More PhD scholars specialising in the latter need to be encouraged. Research and knowledge transfer about entrepreneurship needs facilitation. While many respondents have agreed that their education encourages them to start an entrepreneurship course, several aspects of real field work are not covered in the curriculum. This is supported by the primary data where students indicate lack of confidence through prior training and entrepreneurial experience and the need to develop a personal entrepreneurial attitude.
Moreover, when exposing students to existing entrepreneurs, one must also get a chance to learn about failures, mistakes, challenges and ground reality apart from the success stories because that is the appropriate idea of showing the good and the bad side of the career.
Universities must offer a variety of career options, including exposure to placement opportunities that allow development of an entrepreneurial mind-set. Prior experience of working in a start-up venture is also a catalyst to entrepreneurial behaviour. More harmony can be encouraged between entrepreneurship potential and entrepreneurial training and education so as to develop entrepreneurship among those students who are inclined to take it up as a career. This gap must be bridged by policy makers and institutional bodies of education.
Factors in the social circle and community are discussed in detail in the previous segments of the study. These suggest that career choices are influenced by multilateral forces and not simply a unidimensional or two-dimensional association. Networks would include family, friends, college friends, faculty and even professional circles.

While these are all significant factors in their own distinct impact, the combined influence is what ultimately plays a role in entrepreneurial career choice. Many other factors will be present in the group A and group B categories, however, in the context of the study these are the relevant ones for the particular research. It can be remarked that several factors are directly or indirectly linked to the image of entrepreneurship as a career. The educational course and university's role in shaping this image is prime and when this image is seen in a favourable manner, a lot of challenges revolving around entrepreneurship behaviour can be taken care of. Other stakeholders can also be included in the attempt to boost entrepreneurial spirit among hospitality students.

V.CONCLUSION

This study has provided a comprehensive understanding of the entrepreneurship education landscape in hospitality graduates. Entrepreneurship as a promising career choice as also expressed in the GEM India report where perception towards it as a good career was 53% (Shukla et al., 2018), and this validates the need to continuously research and understand it as a key aspect in industry and academia. While certain aspects are favourable to promote entrepreneurship as a career choice, some factors in this domain need to be worked upon.

This study has touched upon important theoretical concepts of entrepreneurial intention models, entrepreneurship theories and career theories. The model discussed in the previous section gives a kaleidoscopic view of the antecedents of the entrepreneurial intention and behaviour for hospitality students. While this research has extended and contributed to the existing knowledge and literature of career choices and hospitality entrepreneurship, several practical implications can also be offered. Certain measures can provoke a change in perspective towards hospitality entrepreneurship and encourage graduating students to make it a justified career choice. While some colleges are already incorporating these modifications, as evident from the questionnaire responses, an overall change is required. A few recommendations are discussed herein. Business start-up projects and practical experience or internship courses at entrepreneurial ventures can be incorporated in the curriculum. Hospitality specific innovation cells can be commenced in hospitality institutions which may offer pre and post venture commencement support to aspiring entrepreneurs. Performance measurement of entrepreneurship pedagogy can be formulated which can include innovative KPIs and trackers such as number of ventures supported by college in a year, number of students becoming entrepreneurs in a year, number of alumni venture shutdowns and reasons for it, total hours of entrepreneurial training (theory and practical), data on faculty training for entrepreneurship etc. This can enable in identifying the success factors and development areas for each college.

Like any research, this study is not devoid of its limitations. The research methodology has utilised only a questionnaire method of primary data collection, however other methods such as focused group discussion or surveys can be used. The understanding and results are only in the context of hospitality entrepreneurship. Future studies can build upon the results and analysis of this study. The role of faculty in entrepreneurship career choice behaviour can be explored in detail. The role of networks (professional and social) can be further researched to understand their direct influence on motivating a student to become an entrepreneur. Another intriguing tangent for future research would be the temporal effect of entrepreneurship as a career choice and understanding whether it is a short term or long term decision for the student. This study has been significant to incite conversations in this prospering field of hospitality industry and hopes to convince future researchers to continue this dialogue.

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APPENDIX

Entrepreneurship as a Career Choice in Hospitality Industry Questionnaire

Dear Respondent,

As part of my research work, I am conducting a survey that investigates aspects related to **Entrepreneurship as a Career Choice in Hospitality Industry.**
Owing to your experience, I am excited to connect with you to gather some information for this research work. I will be thankful to you for your active participation in the completion of this questionnaire. The information acquired from you in this completely filled questionnaire will be kept confidential.

I thank you for your honest and sincere participation in this regard. If you have any query or problem pertaining to the questionnaire please contact me at samirmulaokar@gmail.com or my contact number +91 9975877902.

Name	
Age	
Educational Qualification and degree name	
Educational Institution	
Any prior entrepreneurship experience? (yes/no)	

1. What campus placement options are offered in your college?
(please tick the appropriate options)

- ☐ Branded chains
- ☐ Standalone outlets
- ☐ Boutique hotels
- ☐ Entrepreneurship & self-employment
- ☐ None of the above

2. Request you to rank your most preferred career choice post your course.
(please rank from 1 to 5, where 1= least preferred, 5= most preferred)

Work in a global branded hospitality chain ___
Work in a standalone establishment ___
Start an entrepreneurship business of my own ___
Work in an existing entrepreneurship venture ___
Join the family business ___

3. ***My course content and education has encouraged me to choose entrepreneurship as a career option.*** **Do you:**
- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

4. ***I am confident of my capability to start an entrepreneurship venture immediately after my course.*** **Do you:**
- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

5. Do you have any experience of working in an entrepreneurship venture (internship/training/part-time/full-time etc.)?
- Yes
- No

6. ***Constructive efforts were made by college/institution to promote exposure to entrepreneurship (through live projects, interaction with successful entrepreneurs, internship etc.)*** **Do you:**
- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

7. ***What would be your top most motivation to become an entrepreneur?***
- Financial rewards
- Being my own boss
- Desire to create an unique business
- Being a job creator

8. ***What would be the top most reason for NOT becoming an entrepreneur?***
- Lack of support and motivation from family
- Risk and uncertainty attached to entrepreneurship
- Lack of job security
- Lack of adequate education, experience and training

9. ***Hospitality entrepreneurship is a viable career choice in the long run.*** **Do you:**
- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

10. Rank the following aspects that can be modified to enhance entrepreneurial attitude.
(rank from 1 to 5, 1=least desirable and 5=most desirable)

Faculty training on delivering entrepreneurship modules ____
Changes in course content and teaching material ____
Encouraging internship and placement in entrepreneurial ventures ____
Development of personal traits and risk taking capacity ____
Shadow training/internship with an individual hospitality entrepreneur ____

Date: _____

I hope you have **completely** filled and answered the above questions. Thank you for your time and support in this research process.

DIGITAL LENDING IN INDIA – THE WAY FORWARD AND CHALLENGES

Satyajit Deb
Research Scholar, Sandip University

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Lending is simply the act of giving money on credit to another person called the Borrower against some pre-decided interest in return. This is universal concept of banking which has got organized in last few decades. The services are catered to Retail well as Institutional customers and changes according to the Economic Structures in different countries. The lending process starts with bringing a borrower onboard then collecting information about the borrower, then validation with the help of various documents deciding what is the amount of credit or loan should be approved to the borrower on the precise interest rates. This entire process if get on various digital platforms through paperless process and with the help of electronic means will be called as digital lending.

Statement of the Problem

In the traditional banking and other formal financial system, lending happens through offline. The entire process of lending in the traditional system is, right from identifying prospective borrower to sanctioning of the loan or credit, carried out manually which is time consuming process and tiresome for the borrowers. The banks use traditional credit scores such as CIBIL credit score to determine the credit worthiness of the borrowers. The traditional credit scores have certain limitations and they do not consider the facts presented by the borrowers. Further, the bankers provide loans only to those people who can access the banks by having bank accounts and to those customers who have ―Good Credit Score. As a result, the individuals and the businesses do not have access to the banks irrespective of larger number of financial inclusion initiatives of the Government of India and those who are short of convincing credit scores become financially excluded. Thus, the traditional banking system makes the individuals and the businesses financially excluded and it has cumbersome and time consuming lending process. These gaps are now filled by digital lending. Digital lending is vey speedy in nature and loans are approved in comparatively lower time period by using technology and alternative credit scores at affordable rate of interest. Some digital lenders sanction the credit in a minute after submitting the required documents and the digital lenders provide variety of credit to meet diversified needs of the individuals and the businesses. Digital lending has revolutionized the lending function and it has emerged as alternative to the bank credit.

How it Works?

As entire procedure of digital lending is online and with the help of electronic media there shall be a huge bulk of data related with the transactions and records made by the borrowers and lenders. Technology plays very important role in setting up the network of digital lenders. Technology also brings in various private players as **'fintechs'** in the market. These people are not just technologically sound but uses more advanced models of Data Analytics and social media along with it. Over the last few years, Financial Technology (FinTech) has emerged as game changer in the financial segment. Financial Technology is basically fusion of finance and technology to provide financial solutions. Digital lending is also known as alternative lending. Alternative lending refers to digital platforms

that provide low-cost loans, which are simple to obtain for the large unaddressed market segment. Alternative lending is a growing industry for digital lending aimed at different borrowing needs, including consumer loans, Small Medium Enterprises loans, working capital loans, and payday loans among others. It serves as a relatively less volatile asset class for retail and institutional investors. The industry primarily consists of digital lending platforms and enablers who facilitate such platforms, such as alternate credit scorers and white label services. These platforms connect lenders, seeking higher returns than banks currently offer, with customers seeking fast, short-term loans. Digital lending has a larger opportunity in India and the total retail loan which could be distributed digitally in next five years – till 2023- would be over $1 trillion (Boston Consulting Group, 2018).

Conceptual Framework of Digital Lending

There is a paradigm shift in the field of lending. Lending is undergoing a fundamental transformation from traditional 3-6-3 formula to 3-1-0 formula. 3-6-3 formula is more prevalent in the traditional banking which means ―raise deposit at 3 percent, lend at 6 percent and play golf after 3 PM. But, FinTech powered Digital lending firms practice the new global formula 3-1-0 which refers ―3 minutes to decide, 1 minute to transfer the money and 0 human touch (Boston Consulting Group, 2018). The key digital lending models in India are captured in the table below:

Domain	**Key components**
P2P lending	Digital marketplaces that connect borrowers (both individuals and organisations) with lenders, allowing quick access to low-cost loans at affordable costs
Invoice financing	Short-term working capital credit to MSMEs, based on their unpaid customer invoices, to meet MSMEs' short-term liquidity requirements
Crowd funding	Digital platforms that enable investees to raise external credit from a large group of investors, by allowing investees to exhibit their business cases, funding requirement and market potential
Pay later loans	Lenders that disburse instant, small-ticket sized loans with the 'buy now and pay later' model for meeting customers' purchases
Mobile lending	Lenders that offer mobile loans to customers by assessing their creditworthiness by leveraging mobile phone data such as call patterns and mobile e-money usage
Digital mortgage	Lenders that facilitate mortgage purchases through end-to-end digitisation of the traditional mortgage loan process, from the application stage to disbursement, through digital channels in order to reduce the high turnaround times prevalent in the existing traditional model
PoS lending	A partnership model with FS lenders where these players finance online shoppers' purchases by utilising both conventional data like bank statements and unconventional data like online transaction history.
Supply chain financing	Marketplaces that tie up with direct lending NBFCs to target merchants selling their goods and services online, by leveraging the huge amount of merchant data residing on these channels.

Digital lending is the process of offering loans that are applied for, disbursed, and managed through digital channels, in which lenders use digitized data to inform credit decisions and build intelligent customer engagement. Digital lending takes many shapes and forms – from automating small pieces, to a fully digital lending process, from acquisition to renewal (ACCION, 2018). Digital lending isn't just doing the same thing better, but rather creating something new. It implies an end-to-end process of developing and delivering data-driven financial products that are applied for, disbursed, and managed through digital channels (ACCION, 2018 Annual Report). Thus, Digital lending is a lending process which provides speedy and smart credits to the borrowers using internet, technology, artificial intelligence, big data analytics and alternative credit scoring algorithms. There are three core components of digital lending which include use of digital channels, use of digitized data and focus on customer experience and engagement (ACCION, 2018). The digital lending ecosystem is complex and evolving. Around the world, digital lending models are characterized by distinct market structures, regulatory environments, and customer needs. Some players offer end-to-end digital solutions, while others focus on a specific component of the lending process and leverage partnerships to supplement their models.

Working Mechanism of Digital Lending

Digital lending is rapidly growing sector in financial service industry all over the world and in India. The contributors of such a growth are usage of internet, technological advancements and big data, digital ecosystem, innovative models, time saving and customer friendly approach.

a. Usage of internet

This is a digital era. Behavioural pattern of people across the world has become ever changing. Indian population is extensively using online transactions in these days which are fuelled by e-commerce websites, digital push of government, cashless economy and so on. In 2014, only 7% of urban people in India engaged in online purchases and in 2018, this percentage has increased to 30% (Boston Consulting Group, 2018).

b. Technological advancements and big data

Technological advancements like artificial intelligence, black chain technology, cloud computing, big data and analytics have remodelled the way the businesses are undertaken today. These technologies brought new Financial Technology companies in to existence. One of such Financial Technology companies is Digital Lending companies.

c. Digital ecosystem

Along with customers' behaviour, it is very essential to have favourable digital ecosystem for the development of digital lending. India has pioneered in creating conducive ecosystem for development of FinTechs and digital transactions. Digital lending has grown significantly as a result of digital ecosystem through various initiatives like Aadhar, Unified Payment Interface (UPI), Bharat Bill Payment System, cashless economy push and Goods and Service Tax (GST).

d. Innovative Models

FinTech companies revolutionized the financial service industry in general and the lending sector in particular through innovative business models like point of sales based lending, invoice discounting

exchanges, bank and FinTech partnership like capital float, market place lending and bank led digital models.

e. Time saving and customer friendly approach

Availing loans through digital way is not cumber some and tedious. But, In fact, digital lending is very simple and smart lending process. It has advantages in terms of time, cost and approach. Digital loans are processed and disbursed using the following mechanism;

Advantages of Digital Lending

1) ***Costs:*** Digital way of lending save a lot of cost over the manpower as well as the fixed asset by any banking or financial institution and also upon the transactions which are made on the daily basis or recorded by manual procedure.

2) ***Technology and Data Processing:*** In today's world technology is very cheap and the data processing services provided all over world are the talk of the town. Therefore it becomes easy to handle many customers at different locations at a time.

3) ***Speed:*** Collection of borrowers information its validation and disbursement of loan becomes easy and in pace that a loan applicant can get this loan instantly in a day or two. Some FinTechs claiming to provide loan within an hour as per the information provided by the borrower.

4) ***Multilevel Network:*** Digital Lending performs various processes on diverse levels where lending institutions with different organizations and channels get associated at one place, which ultimately brings a huge network of Institution growing together.

5) ***Borrower Satisfaction:*** the customer who gets associated with such technological advancement and efficient organization get a good support from their side and feels satisfied over the services provided to him in such short period of time.

Disadvantages of Digital Lending

The world of digital lending is still a new frontier with unfamiliar and untamed landscapes. As such, it comes as no surprise that there are also a few obstacles that arise in this exciting but unexplored territory – we touch on a handful of them below.

1) Reduced human-to-human interaction : By eliminating the human factor through much of the lending process, digital platforms are enhancing customer experience through accessibility, accuracy, and speed. But, the lack of human interaction in the process can hinder the customer experience in other ways.

When it comes to explaining the particular circumstances of a small business or finding solutions to problems that the automated system has not yet encountered or perfected, the availability of human interaction can be an invaluable asset. Online lending platforms are still working to strike that balance between automation and the human touch.

2) Heavy reliance on technology & internet access : While more metropolitan areas face less of a hurdle in this specific aspect, a customer's access to the internet plays a pivotal role in their interaction with

digital lending platforms. A local power outage or a technical issue with the system can 'virtually' (pun intended) incapacitate a customer's ability to use a digital platform.

3) Over-indebtedness : The ease with which borrowers can now get a loan can also be seen as a disadvantage in the long run. Since automation plays such an essential part in online lending platforms, many customers who will be approved for a loan will ultimately have a very difficult time paying it back. This ties back to the way that advanced algorithms learn and adjust themselves over time but can, unfortunately, make mistakes in the short term.

4) Huge interest Rate : One disadvantage that one may have to deal with when it comes to online loans is interest rates. Online business loans are known to have higher interest rates, especially when compared to traditional loans.

Growth of Digital Lending in India

In the beginning of internet boom, millennial, male and metro residents were the users of internet in India (Boston Consulting Group, 2018). But, this scenario has gone and all kind of people across India use internet today. According to research work of Boston Consulting Group on consumer behaviour across purchase journey, 50% of loan seekers with internet access buy their loans online. Further, the research says that growth of digital infrastructure in India and readiness of the Indian consumers will drive the growth of digital lending exponentially. It is estimated that the total value of digital lending in India will exceed $1 trillion over the next five years (Boston Consulting Group, 2018). Small Medium Enterprise loans and personal loans are the leading digital loans of the customers followed by home loans. Technology is now allowing financial services providers to increase financial inclusion in India. The cell phone has become a differentiator, as is having an Aadhaar number. The number of Indians having either a cell phone or an Aadhaar card is now one billion. Armed with one or both of these two enablers, India's unbanked can now hope to access the benefits of the formal financial system. Although digital lending makes remarkable impact in the space of lending in India, there are certain constraints for growth of digital lending.

Importance of Know Your Customer

Although the phrase "know your customer" may seem insignificant to most people, it has a very important meaning in the business world. The process of knowing your customer, otherwise referred to as KYC, is what businesses do in order to verify the identity of their clients either before or during the time that they start doing business with them.

It is increasingly common for banking institutions, non banking institutions, credit companies, and insurance agencies to require that their customers provide them with detailed information in order to ensure that they are not involved with corruption, bribery, or money laundering. With issues pertaining to corruption, terrorist financing, and money laundering becoming so prevalent, KYC policies have now evolved into an important tool to combat illegal transactions in the international finance field. KYC allows companies to protect themselves by ensuring that they are doing business legally and with legitimate entities, and it also protects the individuals who might otherwise be harmed by financial crime.

In terms of the provisions of Prevention of Money-Laundering Act, 2002 and the Prevention of Money-Laundering (Maintenance of Records) Rules, 2005, as amended from time to time by the Government of India as notified by the Government of India, Regulated Entities (REs) are required to follow certain customer identification procedures while undertaking a transaction either by establishing an account-based relationship or otherwise and monitor their transactions. REs shall take steps to implement the provisions of the aforementioned Act and Rules, including operational instructions issued by Reserve Bank of India.

The KYC policy is a mandatory framework for banks and financial institutions used for the customer identification process. Banks usually frame their KYC policies incorporating the following four key elements:

(i) Customer Acceptance Policy
(ii) Customer Identification Procedures (data collection, identification, verification, politically exposed person/sanctions lists check) aka Customer Identification Program (CIP)
(iii) Risk assessment and management (due diligence, part of the KYC process)
(iv) Ongoing monitoring and record-keeping

Financial institutions generally begin their KYC procedures by simply collecting basic data and information about their customers, ideally using electronic identity verification. Pieces of information such as names, birthdays, and addresses can be very useful when determining whether or not an individual is involved in a financial crime. Once this basic data is collected, financial institutes compare it to lists of individuals that are known for corruption, on a list of sanctions, suspected of being involved with a crime, or at a high risk of partaking in bribery or money laundering. Financial institutions also look at lists of Politically Exposed Persons, or PEPs. From there, they then quantifies how much of a risk their client appears to be and how likely they are to become involved in corrupt or illegal activity. Once this calculation has been made, the bank can make a theoretical outline of what that client's account should look like in the near future. Once the expected trajectory of the account is in place, the bank can then consistently monitor the client's account activity and make sure that nothing appears to be out of place or suspicious.

Digital KYC - the New Normal

Covid-19 changed the way humans and businesses behaved, and some of the transformations forced by the pandemic may become the new normal. The nation-wide lockdown and social distancing norms imposed sudden restrictions. Business enterprises had to find a new way to operate. If a customer in a small town needed a loan, where would he go? Similarly, how would lenders find new borrowers since footfalls had reduced?

This is the sweet spot that fintech companies have rushed to fill in, armed with the following guidelines of RBI on KYC issued with a view to leveraging the digital channels for Customer Identification Process (CIP) by Regulated Entities:

a) "Digital KYC" as capturing live photo of the customer and officially valid document or the proof of possession of Aadhaar, where offline verification cannot be carried out, along with the

latitude and longitude of the location where such live photo is being taken by an authorised officer of the Reporting Entity (RE).

b) "Equivalent e-document" as an electronic equivalent of a document, issued by the issuing authority of such document with its valid digital signature including documents issued to the digital locker account of the customer as per Rule 9 of the Information Technology (Preservation and Retention of Information by Intermediaries Providing Digital Locker Facilities) Rules, 2016.

c) Video based Customer Identification Process (V-CIP) is a consent based alternate method of establishing the customer's identity, for customer onboarding. The official of the RE performing the V-CIP records video as well as capture photograph of the customer present for identification and obtain the identification information. Live location of the customer (Geotagging) is captured to ensure that customer is physically present in India

Fintech companies came out with several innovations that have made account opening a breeze. Today a loan account can be opened and activated with minimum human intervention in under fifteen minutes. The digital lending landscape has also evolved dramatically. Today's customer sitting in his town or village can apply for a loan using a digital platform, upload his identification documents and other details and get his loan sanctioned quite easily. The mountain of paperwork and the endless trips to the lender has become obsolescent. The lender is finally able to reach the underserved areas of the country.

With the systems in place, Digital India is ready to move on to digital lending as the new normal. According to MEDICI India FinTech Report 2020, India's lending start ups can function as alternate credit platforms owing to the Aadhaar verification, eKYC, and unified payments interface (UPI) platforms. These ensure rapid background checks, credit scores, and faster loans to the urban, rural, and underserved populations. An incentivized adoption of regulatory sandboxes and central initiatives like the CKYC / Account Aggregator would fast track the process. This could create new value in end-user experiences and primary operations for the Banking and Financial Services industry.

Traditional financial institutions have never expressed a desire to serve risky, low-income consumers in smaller towns and villages. This underserved segment is being tapped by digital lenders who are leveraging the latest technology, lower costs, and alternative credit assessment models to bridge the demand gap and build a wider customer base.

As digitization becomes the new normal, both at the banking institutions-level as well as at the customer-level, digital lending will be based on trust and transparency of data. This will allow India to make giant meaningful strides towards becoming a more mature economy with broader participation of its citizens in the financial sector.

Recent Developments and Actions of Regulatory Authorities

India now has 2,147 fintech startups and almost 500 of them focussed on digital lending. The Reserve Bank of India in a circular dated June 24, 2020, reiterated to banks and NBFCs to disclose names of digital lending platforms engaged as agents on the website while lending platforms were required to disclose upfront the name of the lending institution on whose behalf they are lending. Further, a press release was also issued on December 23, 2020, cautioning people against unauthorised digital lending platforms with an appeal to verify the antecedents of the service provider. The warning is timely as a few bad outliers can undermine the significance of digital lending. It is estimated that the credit demand

from MSMEs and consumers would be more than $1 trillion by 2023, a third of it is likely to be lent digitally.

While penetration of digital methods in the financial sector is a welcome development, the benefits and certain downside risks are often interwoven in such endeavours. A balanced approach needs to be followed so that the regulatory framework supports innovation while ensuring data security, privacy, confidentiality and consumer protection. Recent spurt and popularity of online lending platforms/ mobile lending apps ('digital lending') has raised certain serious concerns which have wider systemic implications. Against this backdrop, the Central Bank has set up a Working Group (WG) to study all aspects of digital lending activities in the regulated financial sector as well as by unregulated players so that an appropriate regulatory approach can be put in place.

The government of India has also come down heavily on lending or loan apps offering instant credit over the internet. The Ministry of Electronics and Information Technology (MeitY) had received a request from the Ministry of Home Affairs for blocking 27 loan lending apps and after due process, MeitY blocked those 27 apps under Section 69A of the Information Technology Act, 2000. The information was shared by MoS Finance Ministry Anurag Singh Thakur in the Lok Sabha earlier this week. However, the names of the blocked loan apps weren't shared in his reply. The information was shared by the MoS in response to a question on whether the government, large technology companies, and regulated digital lenders are jointly looking for a crackdown on fraud Chinese lending apps operating in India.

Concerns of Digital Lending/Recommendations

Countries across the globe have taken different approaches to regulate consumer lending and digital lending platforms. They have addressed prudential regulation concerns of these credit institutions along with consumer protection being the top priority under their respective framework and legislations. However, these lending platforms need to be looked at through the current governing regulatory framework from an Indian perspective.

The typical credit intermediation could be performed by way of; peer to peer (P2P) lending model, notary model (bank-based) guaranteed return model, balance sheet model, and others. P2P lending platforms are heavily regulated and hence are not of primary concern herein. Online digital lending platforms engaged in consumer lending are of significance as they affect investor's and borrowers' interests and series of legal complexions arise owing to their agency lending models. Therefore careful anatomy of these models is important for investors and consumer protection in India.

Should digital lending be regulated?

Under the current system, only banks, NBFCs, and money lenders can undertake lending activities. The regulated banks and NBFCs also undertake online consumer lending either through their website/platforms or through third-party lending platforms. These unregulated third-party digital lending platforms count on their sophisticated credit underwriting analytics software and engage in consumer lending services. Under the simplest version of the bank-based lending model, the fintech lending platform offers loan matching services but the loan is originated in books of a partnering bank or NBFC. Thus the platform serves as an agent that brings lenders (Financial institutions) and borrowers (customers) together. Therefore RBI has mandated fintech platforms has to abide by certain roles and responsibilities of Direct Selling Agent (DSA) as under Fair Practice Code 'FPC' and partner

banks/NBFCs have to ensure Guidelines on Managing Risks and Code of Conduct in Outsourcing of Financial Service ('outsourcing code'). In the simplest of bank-based models, the banks bear the credit risk of the borrowers and the platform earns their revenues by way of fees and service charges on the transaction. Since banks and NBFCs are prudentially regulated and have to comply with Basel capital norms, there are not real systemic concerns.

However, the situation alters materially when such a third-party lending platform adopts balance sheet lending or guaranteed return models. In the former, the servicer platform retains part of the credit risk on its book and could also give some sort of loss support in form of a guarantee to its originating partner NBFC or bank. While in the latter case it a pure guarantee where the third-party lending platform contractually promises returns on funds lent through their platforms. There is a devil in detailed scrutiny of these business models. We have earlier highlighted the regulatory issues in detail around fintech practices and app-based lending in our write up titled 'Lender's piggybacking: NBFCs lending on Fintech platforms' guarantees'.

From the prudential regulation perspective in hindsight, banks, and NBFCs originating through these third-party lending platforms are not aware of the overall exposure of the platforms to the banking system. Hence there is a presence of counterparty default risk of the platform itself from the perspective of originating banks and NBFCs. In a real sense, there is a kind of tri-party arrangement where funds flow from 'originator' (regulated bank/NBFC) to the 'platform' (digital service provider) and ultimately to the 'borrower'(Customer). The unregulated platform assumes the credit risk of the borrower, and the originating bank (or NBFC) assumes the risk of the unregulated lending platform.

Curbing unregulated lending

In the balance sheet and guaranteed return models, an undercapitalized entity takes credit risk. In the balance sheet model, the lending platform is directly taking the credit risk and may or may not have to get itself registered as NBFC with RBI. The registration requirement as an NBFC emanates if the financial assets and financial income of the platform is more than 50 % of its total asset and income of such business ('principal business criteria'). While in the guaranteed return model there is a form of synthetic lending and there is absolutely no legal requirement for the lending platform to get themselves registered as NBFC. The online lending platform in the guaranteed return model serves as a loan facilitator from origination to credit absorption. There is a regulatory arbitrage in this activity. Since technically this activity is not covered under the "financial activity" and the spread earned in not "financial income" therefore there is no requirement for these entities to get registered as NBFCs.

Any sort of guarantee or loss support provided by the third-party lending platform to its partner bank/NBFC is a synthetic exposure. In synthetic lending, the digital lending platform is taking a risk on the underlying borrower without actually taking direct credit risk. Additionally, there are financial reporting issues and conflict of interest or misalignment of incentives, i.e. the entities do not have to abide by IND AS and can show these guarantees as contingent liabilities. On the contrary, they charge heavy interest rates from customers to earn a higher spread. Hence synthetic lending provides all the incentives for these third-party lending platforms to enter into risky lending which leads to the generation of sub-prime assets. The originating banks and NBFCs have to abide by minimum capital requirements and other regulatory norms. Hence the sub-prime generation of consumer credit loans is supplemented by heavy returns offered to the banks. It is argued that the guaranteed returns function as a Credit Default Swap 'CDS' which is not regulated as CDS. Thus the online lending platform escapes

the regulatory purview and it is shown in the latter part this leads to poor credit discipline in consumer lending and consumer protection is often put on the back burner.

From the prudential regulation perspective restricting banks/NBFCs from undertaking any sort of guaranteed return or loss support protection, can curb the underlying emergence of systemic risk from counterparty default. While a legal stipulation to the effect that NBFCs/Banks lending through the third-party unregulated platform, to strictly lend independently i.e. on a non-risk sharing basis of the credit risk. Counter intuitively, the unregulated online lending platforms have to seek registration as an NBFC if they want to have direct exposure to the underlying borrower, subject to fulfilment of 'principal business criteria'. Such a governing framework will reduce the incentives for banks and NBFCs to exploit excessive risk-taking through this regulatory arbitrage opportunity.

Ensuring Fairness and Consumer Protection

There are serious concerns of fair dealing and consumer protection aspects that have arisen lately from digital online lending platforms. The loans outsourced by Banks and NBFCs over digital lending platforms have to adhere to the FPC and Outsourcing code.

The fairness in a loan transaction calls for transparent disclosure to the borrower all information about fees/charges payable for processing the loan application, disbursed, pre-payment options and charges, the penalty for delayed repayments, and such other information at the time of disbursal of the loan. Such information should also be displayed on the website of the banks for all categories of loan products. It may be mentioned that levying such charges subsequently without disclosing the same to the borrower is an unfair practice.

Such a legal requirement gives rise to the age-old question of consumer law, yet the most debatable aspect. That mere disclosure to the borrower of the loan terms in an agreement even though the customer did not understand the underlying obligations is a fair contract (?) It is argued that let alone the disclosures of obligations in digital lending transactions, customers are not even aware of their remedies. Under the current RBI regulatory framework, they have the remedy to approach grievance redressal authorities of the originating bank/NBFC or may approach the banking ombudsman. However, things become even more peculiar in cases where loans are being sourced or processed through third-party digital platforms. The customers in the majority of the cases are unaware of the fact that the ultimate originator of the loan is a bank/NBFC. The only remedy for such a customer is to seek refuge under the Consumer Protection Act 2019 by way of proving the loan agreement is the one as 'unfair contract'.

*"2(46) "**unfair contract**" means a contract between a manufacturer or trader or service provider on one hand, and a consumer on the other, **having such terms which cause significant change in the rights of such consumer**, including the following, namely:— (i) requiring manifestly excessive security deposits to be given by a consumer for the performance of contractual obligations; or (ii) **imposing any penalty on the consumer, for the breach of contract thereof which is wholly disproportionate to the loss occurred due to such breach to the other party to the contract**; or (iii) **refusing to accept early repayment of debts on payment of applicable penalty**; or (iv) entitling a party to the contract to terminate such contract unilaterally, without reasonable cause; or (v) permitting or has the effect of permitting one party to assign the contract to the detriment of the other party who is a consumer, without his consent; or (vi) **imposing on the consumer any unreasonable charge, obligation or condition which puts such consumer to disadvantage;**"*

It is pertinent to note that neither the scope of consumer financial agreements is regulated in India, nor are the third-party digital lending platforms required to obtain authorisation from RBI. There are instances of high-interest rates and exorbitant fees charged by the online consumer lending platforms which are unfair and detrimental to customers' interests. The current legislative framework provides that the NBFCs shall furnish a copy of the loan agreement as understood by the borrower along with a copy of each of all enclosures quoted in the loan agreement to all the borrowers at the time of sanction/disbursement of loans. However, like the persisting problem in the EU 2008/48/EC directive, even FPC is not well placed to govern digital lending agreements and disclosures. Taking a queue from the problems recognised by the EU parliamentary committee report. There is no consumer benefit in an increasingly digital environment, especially in situations where there are fast and smooth credit-granting processes. The pre-contractual information on the disclosure of annualised interest rate and capping of the total cost to a customer in consumer credit loans is central to consumer protection.

The UK legislation has been pro-active in addressing the underlying unfair contractual concerns, by fixation of maximum daily interest rates and maximum default fees with an overall cost cap of 100% that could be charged in short-term high-interest rates loan agreements. It is argued that in this Laissez-faire world the financial services business models which are based on imposing an unreasonable charge, obligations that could put consumers to disadvantage should anyways be curbed. Therefore a legal certainty in this regard would save vulnerable customers to seek the consumer court's remedy in case of usurious and unfair lending.

The master circular on loan and advances provide for disclosure of the details of recovery agency firms/companies to the borrower by the originating bank/NBFC. Further, there is a requirement for such recovery agent to disclose to the borrower about the antecedents of the bank/NBFC they are recovering for. However, this condition is barely even followed or adhered to and the vulnerable consumers are exposed to all sorts of threats and forceful tactics. As one could appreciate in jurisdictions of the US, UK, Australia discussed above, consumer lending and ancillary services are under the purview of concerned regulators. From the customer protection perspective, at least some sort of authorization or registration requirement with the RBI to keep the check and balances system in place is important for consumer protection. The loan recovery business is sensitive hence there is a need for a proper guiding framework and/or registration requirement of the agents acting as recovery agents on behalf of banks/NBFCs. The mere registration requirement and revocation of same in case of unprofessional activities will serve as a stick to check their consumer dealing practices.

The financial services intermediaries (other than Banks/NBFCs) providing services like credit broking, debt adjusting, debt collection, debt counselling, credit information, debt administration, credit referencing to be licensed by the regulator. The banks/NBFCs dealing with the licensed market intermediaries would go much farther in the successful implementation of FPC and addressing consumer protection concerns from the current system.

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REVIEW ARTICLE

Industry 4.0 latest Trends and it's Application

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ABSTRACT:
The manufacturing world had undergone four separate industrial revolts. Industry 4.0 is a most recent chapter in the Industrial revolt story that pivoted mainly on manufacturing automation, live data capturing, smart machines, and internet connectivity with key objectives of productivity rise, optimization of available working hours, and increased organization competitiveness. This research paper studies the industry 4.0 through the survey of available literature in a sequential manner that started with understanding the development of the manufacturing industry from industry 1.0 to industry 4.0, the nine key foundation blocks of the industry 4.0, the cyber-physical systems, the Smart factory concept, industry 4.0 application strategy guide step by step, Industry 4.0 benefits, risk, and challenges. We applied the Industry 4.0 concept step by step as a pilot project as per the Industry 4.0 application strategy guide at the bus bar trunking production factory with the target of delivering the demand of customers within committed or shorter lead time from the bus bar manufacturing shop and discussed the outcomes briefly. We concluded that Industry 4.0 helps to improve operator work-life, overall productivity, and to reduce the operating cost of production drastically in mass manufacturing processes. Industry 4.0 is also a boon in today's changing work culture after the CORONA pandemic through its core concepts of digitization, paperless work, networking, and maximum internet usage. It also guides to adopt automation and smart machines that are communicating in real-time with its customer. We also observed that its application is costly in terms of investment to deploy for small or middle scale manufacturing plants, but they shall implement partly to get the benefit from it.

KEYWORDS: Industry 4.0, Smart Factory, Digitization, Manufacturing automation, Internet of Things.

1. INTRODUCTION:
1.1. Background:
The German word "Industrie 4.0" came from a German government's high technology-oriented project which is promoting the computer base production. This word was revived in the year 2011 at the Hannover event. The manufacturing world had undergone four separate industrial revolts. The first industrial revolt had consisted of steam-powered machine operations, the second industrial revolt involved the electricity-powered mass manufacturing assembly lines, the third revolt updated the industry with computer and manufacturing automation integrations, and the industry 4.0 is a most recent chapter in the industrial revolt story that pivoted mainly on manufacturing automation, live data capturing, smart machines, and internet connectivity with key objectives of productivity rise, optimization of available working hours, improvement in the customer satisfaction, and increased organizations competitiveness (bcg, 2020). Industry 4.0 also frequently called smart production that integrates every work station or process of operation with digitization, machine study, and data mining to prepare a detailed explicable and interconnected system for organizations that improve operations and supply chain efficiency (Epicor, 2020).

1.2 Definition:

Industry 4.0 officially can be defined as "nomenclature for the recent technology of manufacturing automation and data-based communication that includes smart machine systems, cloud database, the internet networking, and cognitive data analysis to build the smart manufacturing industry" (I-scoop, 2020). However, some people consider industry 4.0 as only a marketing hype strategy practiced in production management that trying to seek our notice (Bernard Marr, 2018).

1.3. OBJECTIVES:

a. To understand the detailed Industry 4.0 application process.
b. To apply the Industry 4.0 to a pilot work area in a manufacturing process and analyze the outcomes.

2. Literature Review:

2.1. Development of Manufacturing Industry from 1.0 to 4.0:

The Manufacturing industry got developed in four separate revolutionary phases across the world. The development of manufacturing industry from 1.0 to 4.0 phases is explained below:

a. Industry 1.0: The first revolution in the manufacturing industry had come off in the early 1800s. Human or animal labor got replaced by steam power-based mechanisms or machines during this period.
b. Industry 2.0: The second revolution in the manufacturing industry had come off in the early part of the 20th century; the steam power got replaced by electricity-driven work in manufacturing factories. The machine's efficiency and mobility both improved with the use of electricity. Mass production-oriented manufacturing assembly lines had introduced during this phase.
c. Industry 3.0: The third revolution in the manufacturing industry had come off in the late 1950s; in this phase, the electricity triggered machines are updated with the electronic and further computer-based technology in the manufacturing industry, also the mechanical and analog technology used in the machines slowly got replaced by automation and digitization.
d. Industry 4.0: The fourth revolution in the manufacturing industry had come off in the past few decades; Industry 4.0 is based on more advanced digitization and communication via the Internet of Things (IoT), real-time data control, and the smart machines. Industry 4.0 joins actual with digital and ensures better communication and control between complete value chains (epicor, 2020).

2.2. Foundation blocks of the Industry 4.0:

There are nine key foundation blocks in the implementation journey of Industry 4.0; many of them had been used by the manufacturing industry but collectively they are capable of changing the production bar by fully integrating, automating, and converting them into the optimized flow of production. We shall see this one by one as below (bcg, 2020):

a. Big data and analytics: In the industry 4.0 scope, capturing and analyzing the manufacturing data from different locations, machines, and people will help to take actual time decision making. For Example, Infineon a semiconductor manufacturing industry reduced their rejection at the final chip testing work station by data captured at earlier wafer stage in the manufacturing process, thus Company identified the product failure in the early stage by real-time data study.
b. Autonomous Robots: Robots of today's time are self-driven, they interact with other robots and work safely in a given work environment. For example, ABB is going to launch both an armed robots named YuMi which is capable of assembling the products on assembly lines along with human operators.
c. Simulation: Earlier simulation extensively used in the virtual product or process design phase, but Industry 4.0 started its use in the actual operation which allows actual data integration with virtual data that help workers to set the plan of next changeover of product in queue results in a major reduction of the changeover time by 80 percent.
d. Horizontal and vertical system Integration: Industry 4.0 integrates Customer, Supplier, the different departments in the industry, and industries with one-goal of optimization. Horizontal integration is the digitization of the full value stream interconnects and transfers the data with suppliers, customers, and factory. Vertical integration is an integration of the IT process at a different hierarchical production level**.** These hierarchical levels can be a field that is *interconnected with the manufacturing by sensors,* the machine managing level, or actual manufacturing process level that should be controlled, *further, the* production planning, quality control, and so on *and* order capturing and processing, the complete manufacturing planning.
e. The Industrial Internet of Things: Industrial Internet of things helps the machine, sensors, and devices to communicate with each other and with centralized servers to decentralize the decision-making process that allows actual-time replies to the manufacturing issues. For example, Bosch applied this concept in its valve manufacturing facility where products are recognized by RFID and its work station to know which production step should be done next for different specification products on the same line at the same time.
f. Cyber-Security: As the internet-based data usage and its integration with manufacturing lines are increasing the data handling creates an issue of theft or data

fishing. Cyber-security is a Good solution to answer these problems.

g. The Cloud: The data count is increasing after the addition of the real-time manufacturing data; this problem needs data storage locations that are clouds and its efficiency in terms of reaction time and data storage capacity.
h. Additive Manufacturing: Additive manufacturing such as process of the 3D printing will be commonly deployed to produce pilot batches of tailor-made products that give benefits like less weight, less inventory, and reduced material handling while manufacturing.
i. Augmented Reality: This system supports warehouse part identifying, machine repair, and maintenance information passing on the mobile. Real-time data sharing of such issues helps in quick decision making. For example, augmented reality glasses display machine repair standard operating procedures at the location.

2.3. Cyber-Physical Systems (CPS):

Cyber-Physical Systems integrates the actual and virtual systems to build an interconnected or networked manufacturing process in which devices, machines, and servers communicate with each other artificially. It allocates the foundation for the internet of things; further integrates embedded software-based systems and user interface into a digitized network that easily communicates with each other, modern mobile phones are perfect examples of this concept.

2.4. The Smart Factory:

Cyber-physical systems application in the actual production gives birth to the smart factory as shown in the below figure.

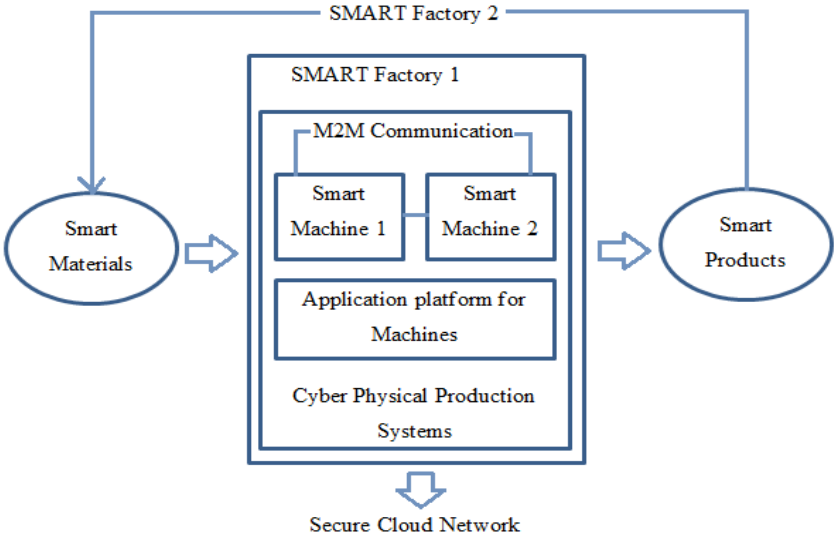

Figure 1: The Smart factory Structure (Secure Cloud data Based Network)

Flexible secure cloud data-based network of the cyber-physical systems made possible the complete automation in the production system in the industry. Flexible data network helps to optimize the production flow to the great extent that helps to reduce cost and time consumption in the manufacturing process (I-scoop, 2020).

2.5. Industry 4.0 application strategy

Industry 4.0 applications strategy is shown step by step in the figure below (bcg, 2020),

Figure 2: Industry 4.0 application strategy step by step

Let us understand the Industry 4.0 application strategy step by step as below,

a. Map out the company's industry 4.0 strategies: Plot the current digital level of the company and make a plan for the next five years. Decide the actions which shall create more value to the company and integrate it with overall all organization business strategy.
b. Develop a new pilot project: Start industry 4.0 applications in a selected product manufacturing line as a pilot project that will help to understand the concept to the entire team member and evaluate the benefit of implementation to the business. This will also help to gain funding from the top management to implement the strategy in other areas of manufacturing.
c. Understand and present the gap or requirements of resource: Map the complete process in the company with the experience of the pilot project implementation and identify the gaps and probable opportunity for digitization application. Industry 4.0 success depends upon the digitization skill of the participating members and their interest; this creates a need of attracting interested and skill full team for the project implementation.
d. Big Data analysis: Big Data communicated by the machine, device, and people should be directly linked to real-time decision making of improving the product quality and manufacturing speed.
e. Change into a digital company: Industry 4.0 concept best utilization needs a complete application to whole stakeholders in a company. Enforce the digital culture or "tone from the top" to ensure every person think digitally.
f. Develop an ecosystem view: Real business growth starts with mapping the consumer behavior and adapting this within the suppliers, consumers, and business partners.

2.6. Industry 4.0 application Benefits

a. It makes local businesses more competitive to deal with global competition like amazon who already best performing in optimizing their resources, transport, and supply chain management.
b. As Industry 4.0 is a comparatively new concept hires a new talent and builds a young workforce who raises efficiency, teamwork, proactive and predictive data analysis, and involves workers, supervisors, and managers to utilize actual-time data to make better decisions to respond probable problems before they create any major failure.

2.7. Industry 4.0 application challenges and risks

The main challenges in an Industry 4.0 application are (epicor, 2020),

a. Definition of exact implementation strategy: Industry 4.0 champion should develop clears implementation strategies to define all the required resources and timelines.
b. Executing successful pilot Projects: Pilot Project is going to build trust in the top management who are going to allocate the fund for complete project execution, hence pilot project success is very crucial.
c. Culture of Company.
d. Skilled manpower acquisition for adapting the digitization change quickly.

The main risk in an Industry 4.0 application is,

a. Cyber-security and privacy as the data phishing of the Industrial Internet of Things going to create problems in big data capturing and analysis. Data security is also a concern as product drawing, design, and specification security is important.
b. The endless and very important human risk of future of work availability, job availability, and financial crisis built up based on these aspects.

3. Pilot Project application:

3.1. Overview:

The Legrand facility at Ambad, MIDC of Nasik city is a manufacturing bus bar trunking system commonly used at high rise buildings, Malls, industrial construction, and Hospitals to transfer 630 to 5000-ampere current from transformer to the respective floors. The customer expects this make to order product delivery at the actual site usually within three weeks after order confirmation. We decided to adopt the Industry 4.0 concept to deliver this demand within committed or shorter lead time from the bus bar manufacturing shop as per the Industry 4.0 application strategy guide.

3.2. Pilot project application step by step:

a. Mapping of current bus bar manufacturing process: Bus bar manufacturing involves bus bar and insulating material cutting as per customer requirement, wrapping of insulating material over bus bar, and arranging four bus bar in RYBN shape, assembling it in the casing enclosure, further 100% high voltage testing of this bus bar and manual data-keeping, application of finish good stickers to the bus bar assembled if high voltage test found Ok and shifting it to final packaging, further dispatch of the packed material to the respective customer within three weeks commitment.
b. Selection of the pilot project area: We analyzed the possibility of the industry 4.0 application at the High voltage testing, sticker pasting, and production declaration area and selected it as a pilot project area.
c. Process Gap or Opportunity identification: We further studied this process in detail and found out the opportunities where we shall apply the digitization as below,

1. High voltage testing data is manually entered in the logbook by the operator.

2. Finish good sticker is given by the supervisor to the operator manually.
3. Production declaration of bus bar assembly is done in the ERP system after high voltage ok approval from the operator in the logbook at the day end by supervisor.

d. Resource allocation: We decided following digitization actions on the above gaps,

1. High voltage data will be stored in the testing machine once the operator enters the product detail.
2. We shall deploy the Finish good sticker printer near to high voltage testing machine and link it directly to the testing machine, Printer will only send print if testing is found Ok.
3. We further decided to add barcode of respective product item code on the finish good sticker and we shall deploy the scanner to scan it. The scanner will be directly linked to the ERP system and once the operator scans the barcode the real-time production declaration will happen.

All these actions will require the printer, scanner, interconnection of these devices through the Internet of Things, and training session to the operators for this system usage, we sent this entire requirement for management approval and deployed it at the workstation accordingly.

e. Big Data analysis: After the planned process improvement we started receiving the real-time data of High voltage testing and production declaration which improved the traceability, proof, and timeline details of product manufactured even after the dispatch.

f. Complete Digitization: Through this pilot application of industry 4.0 we got confidence in our ability to adapt the change to the digitization and its benefit, hence further decided to extend its scope to other workstations.

g. Ecosystem View: We also explained this improvement to our suppliers, customers, and all the workmen that helped to involve all the stakeholders to create a holistic view of the complete value stream.

3.3. Pilot Project benefits realized

We realized following list of the benefits after actual implementation of the Industry 4.0,

1. Our high voltage testing data is directly saved from the machine to cloud which is very authentic and available in real-time to every stakeholder.
2. This data improved the trust of the customer as this is a 100 percent compliance test for all the products and traceability even after years as the product has a 17 years warranty span.
3. Finish good stickers direct linkage with the high voltage machine resulted in the error-proofing of sticker mismatch.
4. Finish good barcode introduction and real-time production declaration by mere scanning of it resulted in the elimination of supervisor work/improvement in productivity of manual production declaration in the ERP at the end of every day.

4. CONCLUSION:

We concluded that Industry 4.0 helps to improve operator work-life, overall productivity, and to reduce the operating cost of production drastically in mass manufacturing processes. Industry 4.0 is also a boon in today's changing work culture after the CORONA pandemic through its core concepts of digitization, paperless work, networking, and maximum internet usage. It also guides to adopt automation and smart machines that are communicating in real-time with its customer.

From our Pilot project study, we concluded that Industry 4.0 increases the transparency, trust, and traceability of the finish product data as well as improves the supervisor efficiency. It also does the error-proofing of the mismatch of product stickers which improves the product quality and eliminates customer complain.

We also observed that its application is costly in terms of investment to deploy for small or middle scale manufacturing plants, but they shall implement partly to get the benefit from it.

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ARTIFICIAL INTELLIGENCE IN PROJECT MANAGEMENT: SWOT ANALYSIS

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ABSTRACT

Every multifaceted project has its unique problems and challenges which can be overcome by good project management practices. Juggling three pillars of project management simultaneously which involves maintaining perfect balance between time, budget constraint while ensuring quality is a challenging task. At times, it is found that time and cost over-runs remain a widespread pain area in various types of projects. Project Management practices are currently being meticulously used in all kind of industries including educational institutes. The use of AI approaches in project management can be a way to improve the project management lifecycle's ability to deal with unpredictability. Artificial Intelligence has effectively produced a more comprehensive and competent means of completing the many project management functions, and there is no question that it will entirely alter project management in the next years. The goal of this research study is to determine the Strength, Weakness, Opportunities and Threats [SWOT] of AI techniques in project management. The research will aid industries in determining the best use of AI for project management that will meet the needs of all project stakeholders involved in project execution.

Keywords: *Artificial Intelligence, Machine learning, Project Management, SWOT.*

Introduction

A project is a unique temporary task being performed with specific goals in mind that is quantified in terms of predefined parameters. A project is usually considered to be a success if it meets within the objectives of the acceptance criteria including time and budget. The application of standard techniques, methods, knowledge, skills and prior experience to meet the project objectives is known as project management. Project management is akin to juggling three balls at once since it necessitates striking a delicate balance between delivering on time, on budget, and with high quality. Overruns in both public and private projects continue to be a source of frustration. AI in Project Management is an approach that can manage several tasks without requiring a large number of resources. It does not necessitate any additional resources or expenditures. The duties can be completed automatically by utilising artificial intelligence. AI also aids in project decision-making and recognising the talents and skills of team members which are part of project.

In recent years, Artificial Intelligence (AI) has become one of the most thoroughly investigated and developed technologies. Artificially intelligent systems have quickly made their way into real-world applications, from smart personal assistants to self-driving cars, and they continue to do so at an exponential rate. Almost every career is being reimagined as AI systems, robots, and cognitive tools become more sophisticated, offering new opportunities.

Project managers must be ready to adapt to future advancements in order to keep up with the times. Purposeful AI will aid project managers in adding value at various stages of the project lifecycle. Machine learning in the project management environment aids project managers in forecasting stakeholder behaviour, income, and risks using historical data and organisational expertise. The ability of an organisation to gather the right data at numerous phases of a project and a knowledge management policy to capture the expertise and experience of its staff are both critical to the successful installation and reliability of a project management AI platform. All these developments bolster project managers' abilities.

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The research work aims at identifying the exact functions that can be done using AI required by the companies for managing the project management activities.

Problem Statement

Large-scale, complicated project management is entering an era of extraordinary complexity, one that demands more attention and investigation.

Expert judgement and parametric utilities are used to manage and monitor projects. Projects are the instruments via which organizations put their plans into well-defined action. Project success figures, on the other hand, remain exceptionally low. This is a troubling condition with considerable economic implications, hence new frameworks for project success rate prediction are to be derived to evaluate project success or uncover vital success elements. Artificial Intelligence frameworks can be used in several of these required tools. Most of the companies/project managers lack in the knowledge of progression of AI framework for their organization thus resulting to project failures at large.

The following major questions are addressed in this research.

- What are the gaps in existing project management frameworks
- Importance of Artificial Intelligence framework in project management knowledge areas for project success
- Evolution of application of AI in project management for project success
- What are the associated challenges for implementation of AI framework in Project Management

Research Objective

To study and analyse the major Strengths, Weaknesses, Opportunities and Threats [SWOT] of Artificial Intelligence framework in Project Management

Research Methodology

Analysis of literature sources concerning the SWOT analysis of usage of Artificial Intelligence in Project Management

Qualitative research method has been used in current research for carrying out SWOT analysis of usage of Artificial Intelligence in Project Management.

Qualitative method of research is adopted so that analysis of motivations, opinions and reasons become possible.

Research Analysis and Findings

- The Strengths, Weaknesses, Opportunities, and Threats (SWOT) technique is used to evaluate new projects and activities. SWOT analysis is a useful tool for assessing progress, developing strategies, and making future decisions.
- SWOT analysis may assist in identifying critical aspects such as competitive advantages and future development prospects while also bracing the organisation for impending dangers.
- Under the scrutiny of artificial intelligence systems, the SWOT matrix can be used in project management as a function to explore future opportunities and threats.
- Various Literature were studied to carry out SWOT Analysis. For each Strength, Weakness, Opportunities and Threats, 10 points has been compiled and enumerated below.

Strength Analysis

- **Data Preparation**

  AI is perfect for processing vast amounts of data and information.

- **Lower the Project's Costs**

  For some industries, AI may be able to help lower project costs.

- **Project Management for Technical Projects**

The various tasks required in managing and conducting a project are referred to as technical project management. The areas that are mostly served by the AI systems that are currently available are simple to identify. Intelligent project management teammates, software programmes, and machine learning algorithms assist project managers in daily tasks by analysing status and supporting data-driven experiences and forecasts based on a database built from past projects.

- **Business and Strategic Management**

To investigate, judge (based on both rules and sentiments), or make different or better company decisions, strategic and trade management skills are required. AI can assist in the design of parameters, the identification of interdependencies, and the determination of trade results. The better AI can assist the project manager, the more complex the basic models are, and the more precise and information streams are available.

- **Leadership**

This domain encompasses a variety of interpersonal skills such as guiding, driving, and encouraging people from various backgrounds. The AI frameworks that are currently available can help with candidate selection by showing a short list or positioning based on a defined set of requirements and designs, but they are still unable to take

- **Increasing Productivity**

Instead of wasting hours of people on trivial, recurring activities, AI will allow us to manage massive projects more efficiently than before.

- **Management of Assets**

We can use these technologies to manage all of our digital assets. I also enable us to manage versions without requiring additional effort. Previously, we used a variety of technologies to manage all of this, which necessitated a variety of skill sets.

- **Risk Reduction**

Overall, it reduces risk and keeps the project on schedule. We receive notifications as soon as any disparities appear, and we have a mechanism to audit the system and correct the problems. It reduces the chances of a project failing. If there are any complications with the project, we will be aware of them ahead of time.

- **Avenues Available**

Rapid advancement of AI technology in project management, engineers will be in greater demand to develop, research and test AI based systems.

- **Skills Requirements**

The demands of an AI based environment will require an educational system which provides industries with talent that is ready to add relevant value.

Weakness

- **Influence**

In a variety of ways, the project manager might persuade the team to complete the task. He takes on the position of a leader. If you use influence correctly, you may persuade the entire team to work toward a common goal. Without a doubt, when the entire team works together, we achieve superior deliverables and a successful project. These may lack with AI based project management.

- **Negotiation**

AI tools will be useful for follow up and reminders, but at times you may need to have talks to better appreciate the issues or learn about the project's positive aspects. You will be able to make changes in the future if you have a regular touch point.

- **Inspiration**

Good leaders inspire their teams to complete their tasks. It's a human trait; individuals want to see the broad picture or outcome of the work they're doing. You've already won half the battle if your team is dedicated to achieving a common goal.

- **Fill in the Missing Information**

When you start a project, there are always some unknowns; the PM fills in the gaps, and as the project progresses, we discover new tasks or solutions. The PM's job is to constantly seeking for answers while the rest of the team is focused on their own assignment.

- **Human Touch**

When working with humans, we cannot overlook the importance of human contact. Humans are a social species. We desire to collaborate with one another. A skilled project manager will assist the team connect and identify solutions to problems, as well as bring the entire team together for a celebration after the project is completed.

- **Assisting with AI powered PM tool**

We may require a skilled PM to build the PM tool for the first time in order to handle projects on it. To achieve the best results, you must provide the system with the correct information. We may require a technical person to build the system, but the PM will be in control of the system and will be accountable for providing the information needed to build the system prior to the launch of the project.

- **Big Data**

Data cleansing and processing takes a long time, and assuring data integrity takes much longer.

- **Regulations and Standards**
  - Ambiguous ethical standards
  - Uncharted legal/liability and regulatory issues, as well as standards
  - Uncertainty about existing regulations' compliance
  - In highly regulated businesses, the risks of algorithmic explainability and compliance
  - There aren't any industry-specific best practises available.
- **Criteria for Qualifications**

The needs of a techno environment, particularly in AI, will necessitate an educational system that provides industries with required resources that will immediately add value.

- **Adaptability**
  - As previous procedures become obsolete at a faster rate to keep up with technological breakthroughs, adaptability will be an essential characteristic.
  - Having trouble acquiring and developing talent.
  - AI initiatives competing with other projects in the firm Safety aspects of AI systems
  - Cultural stumbling blocks to AI adoption

Opportunities

- **Integration**

AI automation technologies have made it possible to connect multiple platform tools for project reporting and progress tracking. It can look into resource allocations, task status and issue alerts if any risk occurs utilising these tools. It also allows us to send notifications to the appropriate stake holders to reduce risk. Project Management tools can also be linked to the source controls thus allowing for real-time tracking Project status.

- **Documentation**

Project management necessitates extensive documentation. AI tools aid in the creation of document templates, the collection of data from diverse systems, and the recording of successful initiatives. It also keeps some recurring documentation on hand for when it's needed.

- **Reporting**

Tools for project management can check the current progress of the task on the fly, making reporting simple. We don't have to waste time creating reports because they appear in the report as soon as we finish our activity. We can also tailor reports to meet your specific requirements.

- **Forecasting**

AI tools can be used for forecasting, budgeting, risk management and resource allocation. It also allows to utilise resources to their full potential. It all adds up to company growth and profit sharing in the end.

- **Analytical Prediction**

Using AI techniques, we can develop future models based on past learnings. When it comes to leveraging AI, data is king. Data aids in the development of appropriate models. The more, the better. So, as we work on ongoing projects, these AI based tools are collecting all required data in order to build the tool smarter and assist us in making judgments for the project life cycle. It will allow us to propose project strategies based on our previous initiatives using data backup.

- **Budgeting**

These tools can be used for project budgeting and forecasting. Tools also aids in keeping projects within budget and highlighting any potential spending hazards. AI based tools can track the entire project budget, which will aid for proper auditing.

- **Notifications and Reminders**

Notifications and reminders can be set based on project criteria which will aid PM's to ease the distress of multiple follow up and tasks which requires attention.

- **Allocation of Resources**

Using the PM tool, we may allocate resources and personnel to the project. It will keep you from having to deal with multiple allocations. We may also use these technologies to track resources and discover the correct competence based on previous initiatives.

- **Workflow and Approvals**

Within AI-enabled technologies, workflow and approvals for project activity are simple to handle. It also provided approval notifications and reminders and Communication channel that are less error-prone and speedier.

- **Digital PMO**

Within AI-enabled technologies, Digital PMO can be created to help all new projects to get the required data from organisation project repositories.

Threats

- **Reduction in Employment**

Often people imagine that due to artificial intelligence usage rise in employment losses may occur.

- **Human Control Efficacy**

Engineers believe that AI will become so intelligent that no humans will be required for execution of the projects which appears to be a distant concern.

- **Lack of Comprehension**

Engineers aren't sure how AI anticipated outcomes have been calculated. This not only presents confidence challenges but also poses legal and accountability concerns.

- **Complementing Technological Advancements**

Data analytics is rapidly evolving, making it challenging to stay up with technological breakthroughs and the benefits they bring.

- **Management of Resources**

Many businesses simply lack the IT infrastructure and knowledge required to successfully use big data.

- **Conclusions that are incorrect**

AI Data: Unprepared Due to bias in algorithms, data, or the teams in charge of administering multiple projects, incorrect conclusions may be reached.

- **Cost Implications**

Top managements are cautious to invest in new AI based systems since they have already spent considerably in old software systems.

- **Management of Risk**

AI is not without its drawbacks. Algorithms are being built to simulate human behaviour as close as feasible. As a result, algorithms may induct human bias. While AI is useful for unorganised data, mandatory classification, forecasting and predictions but not suitable for grasping the "why" particularly when several external factors are stakeholders.

- **Ethical Concerns**

Many ethical difficulties are to be adopted by AI, which necessitates comprehensive due persistence and impact evaluation.

- **Early Developmental Stages**

Project Management AI Applications are still in the early stages of development and need to be improved on a regular basis.

Conclusion

AI can help with the administration and execution of various processes that are frequently repeated.

Project managers are diverted from dealing with strategic issues by such duties. However, using AI in the project management is a relatively new endeavour associated with some risks. It's important to remember that even the trained AI algorithms in project management systems can't ensure that they'll run smoothly, so staff should keep an eye on the data that AI consumes on a frequent basis to avoid outcomes that are skewed.

Main conclusion from the reviewed papers is that inclusion of AI with project management practices has proven to be beneficial for increasing success of the project. Although AI technologies lack sensitive and reasoning capabilities but at the same time it holds powerful tools for investigating and forecasting project management success or failure.

However, there are certain challenges such as high skills, maintenance, high cost which needs to be look upon before implementing AI in any organisation. To conclude, AI can be seen as an optimistic opportunity in project management as it aids various project management activities for project success and AI tools will be really aid for the project manager to monitor and control the project.

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ARTIFICIAL INTELLIGENCE IN PROJECT MANAGEMENT: A LITERATURE REVIEW

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ABSTRACT

Artificial Intelligence (AI) is emerging as most researched and developed technologies and the popularity of artificial intelligence (AI) techniques will only continue to rise in coming years. Project management is like managing three balls simultaneously i.e. time, budget and quality and the problem of time and cost over-runs remains a common pain area in various types of projects. Applications in the project management practices are currently growing, both in academic research and in industry onto the connection of AI methods in project management to improve uncertainty during execution of the projects. Artificial Intelligence may completely transform the Project Management in coming years and has effectively created a more comprehensive and competent way of fulfilling the various project management functions. This paper brings out the literature review of 10 papers to understand the changes that can be brought by the use of Artificial Intelligence in the various functions of Project Management.

Keywords: *Artificial Intelligence, Machine learning, Project Management.*

Introduction

A project is a unique activity which is undertaken to achieve required objectives defined in terms of outputs, outcomes or benefits. A project is deemed to be a success if the required objectives according to acceptance criteria, agreed time-scale and budget are achieved.

Project management is the systematic application of the processes, knowledge, skills and gained experience to meet the project objectives.

AI application in Project Management is a system that can apply to the different projects without many resources.

Artificial Intelligence (AI) is the most deeply researched and emerging technologies in recent years. like smart personal assistants , self-driving vehicles etc. Artificially intelligent systems have made impact into real world applications and will continue to do so with an exponential speed.

As AI systems, robots and cognitive tools are becoming more sophisticated with every job being reinvented followed by the augmented workforce. These fast moving developments are leading to a enormous change in the working culture due to expectations arising from the future workforce.

At present lot of hype, concerns around AI are being created like how AI can impact the workforce, whether re-skilling or workforce transition is required. Developments of the project managers are also a matter of great concern to adopt the AI future.

No doubt that AI will help the project managers to add required value in various phases during execution of the complex projects within all sectors.

Machine learning usage in project management landscape will aid the project managers to forecast Stakeholder behaviours, cost and risks based on past data of the organization.

Implementation and maturity of a project management with AI platform successfully solely depends on organization ability to capture rrequired data at various stages of the project and its methods to capture the experience of its workforce.

With the boom of AI applications during execution of the projects, reinforcement of the project managers in coming days in the field of the project management has to be revisit as their span of activities and work along with computers and algorithms will exponentially increased.

Literature Review

In order to carry out this literature review search was carried out to find different approaches and utilisation of artificial intelligence in project management. The keywords used for this search have been: "AI in Project Management", Project Management", "Artificial Intelligence" etc.

Based on the search results, 10 papers was selected for review and conclusions from the papers / authors view has been summarized.

(Johnsonbabu, 2017) in his paper brought out that Artificial intelligent will help project managers to increase value addition in project by optimizing their effort in maximizing project success and freeing up from repetitive operational activities. Project manager would be able to work towards establishing Project goals, improve product quality, Optimize cost, align seamlessly with Project team, vendor pools, and geographical locations. However Human intuition, feelings, ideas, emotions and passion cannot be replaced by AI, thus a project manager will be needed in future. Project manager in the near future need to adopt in this paradigm shift of understanding and using the cognitive intelligence to their advantage.

(Munir, 2019) in his paper concluded that this is the era of technological advancements and more of the technological advancements have been made within every field that has changed the lives of individuals. Now-a-days, the big data and data science are very common terms. Both of these involve the use of AI, so basically AI provides the backend. Artificial intelligence is basically a device that helps to make some perception related to the environment and it assists in taking such actions that can lead to the attainment of actual goals. The artificial intelligence is now used within various fields. Its applications are not confined to only one particular field. However, within the field of project management, there is broader use of AI. The Project management AI is basically a system that helps in doing the administration of different projects. It helps to handle various projects and through using the available resources. Project management AI helps in fostering a safer environment. Along with it, the use of project management AI is done for developing an eco-system that basically helps in doing the management of knowledge. AI provides greater assistance to project managers in different ways. It helps in doing different tasks using different tools available for the project managers like Chatbots, Strategjos, ZiveBox, Rescoper, ClickUp, Clarizen and Polydone.

Chatbots help in identifying urgent tasks and the tasks that needs to be done currently and such other things. Straegios helps in developing agile models.

Zivebox helps in identifying that in what particular time period, the task will get completed.

The tool Rescoper helps the project managers to handle the tedious management parts. It also gives system alerts to the project managers and identify for if the project will be done within the given deadline or not.

Clickup tool helps in predicting the total number of team members appropriate for the given project. Polyden tool helps in managing the time and budget of projects.

The tool Clarizen allows easier sharing and tracking of data.

The project managers have got more support, accuracy, insight and strategy by making the use of AI for projects. Moreover, it has also increased the productivity of project managers at

individual levels. As the AI tools have assisted the project managers to become more emotionally intelligence, creative and to eliminate information bias. However, there are also some of the risks associated with it, as because of the incremented use of AI within the field of project management, there will be a time where there will be no need of project managers and machines will replace it. In the future research, these risks will be analysed.

(Alneyadi & Ali, 2014) brought out that most of Information Technology (IT) projects do not succeed and reach their objectives and this is due to the challenging nature of IT project management. IT project management suffers from high complexity, uncertainty and non-linearity. This research of author is concerned about the uncertainty of time management, the complexity of cost management and the non-linearity that is increasing in time and cost management at times when multiple projects are executed. To overcome these issues, this research proposed to use of Artificial Intelligence (AI) because of its ability to handle complex non-linear problems. Two AI techniques are the focus of new methodology. These techniques were Fuzzy Inference and Artificial Neural Network to cover time and cost management.

(A. BUTT, 2018) has made conclusion that the results from the mixed-method research approach allowed the identification of the project management areas like Project Planning, Resource Management, Budgeting, Quality Management and Change Management which hold the most potential for AI system support. Additionally through his research, author also identified the key issues like Manual & Repetitive Tasks, Constant Tracking & Changes, Prioritizing Between Multiple Tasks & Projects, Inefficient Internal Systems & Process Flows which project managers face frequently.

Author also brought out through his findings that there are several areas of opportunities within project management where AI systems could be developed to support project managers. An existing project management AI solution for risk analysis and risk management were also found and can ultimately be used to strengthen the business case in support for the development and use of AI in other project management elements.

Several key insights about the views and knowledge of project managers regarding AI systems were also established during the course of this study. One significant finding is that the project managers in this study have a highly positive inclination towards using AI systems in their daily work. The business demand, therefore, is quite high. Another finding relates to the lack of awareness concerning AI systems within the project management community which could significantly inhibit the systematic AI utilization for this specific function in the future. It is crucial for organizations to tackle this by educating project managers about AI as well as by employing AI scientists who can drive the organization's technological strategies to ensure positive growth in the upcoming digital era for project management.

In order for organizations to successfully implement AI-based solutions and ensure efficient human-machine collaboration in the future, it is vital to develop and implement strategies specifically designed for enabling the digitalization of workplaces. The existing project management AI solutions in this regard form a good starting point for building scalable models for the future. The future workplace will inevitably involve humans and machines working side by side and the survival of organizations relies on embracing this heavily changing environment as early as possible to manage it effectively.

(Magaña Martínez & Fernandez-Rodriguez, 2015) brought out that the possibility of project

success prediction or identifying critical success factors in advance is a field of research where researchers have been working intensively for project management purposes. Initially approaches were based on statistical models which were not able to answer to project Management requirements. In artificial intelligence authors have found that AI algorithms and tools deal better with project uncertainty and in the complex environments.

Author brought out that algorithms like Neural Networks, Fuzzy Cognitive Maps, Genetic Algorithms, Bayesian Model, K-Means Clustering etc are better for Critical success factors and Project success prediction:

(Bob, 2019) has touched upon some of the considerations and implications from accelerating deployment of AI in project industries, especially engineering and construction. Some of the considerations highlighted in the paper are:-

- Accuracy and qquality of results
- Emerging legal and liability issues
- Impact assessment of ethical AI issues
- Non seen biases
- Quality and limits of training data
- Lack of verifiability
- Diagnosis of errors
- Access to sufficient data including relevant dark data
- Uncertainty around compliance with existing regulations developed pre-AI
- Data integrity
- Adequacy of interoperability
- Assumption tracking and linkage to AI use cases
- Constraint awareness and tracking as it relates to the AI we deploy
- Insight into AI optimization parameters

(S. Elrajoubi, 2019) in his paper concluded that big data has involved in the use of AI, so AI provides the backend. Artificial intelligence is a tool which aids for perception pertaining to the project environment and helps in taking decisions that can help for achieving the specific goals. AI applications are not applicable to one specific field; however within the area of project management use of AI is extensive. AI in Project management is a system that helps in the management of various projects and helps to tackle different projects using the available resources. Project management AI helps in bringing up a safer environment. In addition to the use of project management AI is used for developing a platform that helps in the management of knowledge in different industry sectors. AI provides aid to all project managers in various tasks using different material to make daily tasks easier and effective.

Project managers nowadays have more assistance, insight, accuracy and strategy in project management which has increased the productivity of them at various capacities as the AI tools have helped them to be more creative and emotionally intelligent. However one myth is emerging that increased usage of the AI in the field of project management that computers and machines may replace humans in the coming years.

Notwithstanding all factors, AI will play important role for success of the project maintaining the company's competitiveness and increase financial targets. With increase in the efficiency of the project team due to AI tools, Project managers should update themselves with AI technologies to apply it in their daily activities work.

The SWOT matrix can be applied to project management as a function to investigate the potential opportunities and threats for the future under the microscope of artificial intelligence systems.

(M. U. S. Kunnathur, 2020) brought out in his thesis that even with all the limitations, basic methodology (for future) and advantage of AI will be:

- Collecting real project data
- The data will be organized (structured like a database)
- Python will generally used
- If there are lots of data or more accuracy is needed, then using a cloud service such as Amazon Web Services will be better
- The computer will analyse all the data and will finds patterns which will help to make a more accurate prediction
- In AI the machine basically will learn from its mistake so if the prediction is wrong, it will only get more accurate in the future.
- Will reduce delays due to human error
- AI in project management will not replace humans. The project managers will be important, however it can be a powerful tool for a project manager which can increase productivity

(Adel Belharet, 2020) have brought out that Artificial Iintelligence has a extensive range of business applications, however Impact of same is is being seen in project activities. In his report, author has share findings to aid in understanding the impacts of Artificial Intelligence during projects execution which will reshape project management in the coming days based on AI learning's.

It has also brought out the details of the findings on impacts of AI on the PMO. A brief summary of the various categories of emerging PMO models are brought out stressing on potential impacts of AI. Project Management Office has to amalgamate into function concerned with change, strategy, product evolution and organizational governance as smart machines will assume and absorb functioning of PMO. This trend can be extrapolated as being a start of the massive digital transformation that project management professionals may face in the coming years.

(El Khatib & Al Falasi, 2021) brought out that AI is playing a vital role in the data management and arriving at the key decisions. The AI had played a key role in the UAE particularly in project management in the area of managing and collecting data due to high accuracy of data as one of the major attributes. AI has made positive impact on the quality decision as AI had significantly manage enormous data than any other previous source used by organizations. Citing the AI as complicated subject, few organizations are hesitant to use AI. Lack of leadership and interpersonal skills is one of the key reasons within the organizations to implement AI for project managementt. Most of the organizations has overcome this hurdle and are being shifting towards AI model for the organization growth and to sustain competitiveness.

Conclusion

Main conclusion from the reviewed papers is that inclusion of AI with project management practices has proven to be beneficial for increasing success of the project. Although AI technologies lack emotional and cognitive capabilities but at the same time it possesses powerful tools for analysing and predicting project management success or fate.

However there are certain challenges such as high skills, maintenance, high cost which needs to be look upon before implementing AI in any organisation. To conclude, AI can be seen as a

optimistic opportunity in project management as it aids various project management activities for project success and AI tools will be really helpful for the project manager to control and monitor the project.

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Artificial Intelligence in Project Management: Study and Analysis with perception of Project Managers and Executors

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Abstract

AI in Project Management is a process of system that can execute different projects simultaneously without many multiple resources thus saving time and cost. With the power of artificial intelligence, the tasks of projects can be executed automatically within time and cost schedule. AI enables to take decisions pertaining to the projects and helps in managing the skills and capabilities of team members which are part of the project.

In this paper, Percentage analysis, Five point-scaling technique and Average score analysis has been attempted considering Project Manager/executors perception of DPSUs with respect to usage of Artificial Intelligence in project management.

Keywords: - Artificial Intelligence, Machine Learning, Project Management, SWOT Analysis, Percentage analysis, Average score analysis, Five point-scaling technique

1. Introduction

Project management for an organization is a tool to achieve excellence in performance catering employee satisfaction to the highest level. To harness the maximum potential of an organization its manpower and the resources, Project Management Practices are being followed systematically in various Defence Public Sector Units. DPSUs are well aware that effective Project Management System (PMS) brings the real value to the firm in terms of Time, Cost and

Quality of the projects.

AI in Project Management is a process of system that can execute different projects simultaneously without many multiple resources thus saving time and cost. With the power of artificial intelligence, the tasks of projects can be executed automatically within time and cost schedule. AI enables to take decisions pertaining to the projects and helps in managing the skills and capabilities of team members which are part of the project.

In this paper an attempt has been made to analyse the DPSU executives knowledge of Project Management, Artificial Intelligence and Usage of Artificial Intelligence in Project Management. On line questionnaire comprising of personal factors, experience factors, Project Management, Artificial Intelligence and Usage of Artificial Intelligence in Project Management were utilised to obtained the inputs from the Project Managers and Executors of DPSUs. The collected data were depicted in various forms in the suitable tables and following tools were employed in tune with the objectives of the study.

- Percentage analysis
- Five point-scaling technique
- Average score analysis

2. Analysis Methods

The percentage analysis is an important tool to identify the distribution of the respondents for various category which facilitates comparison. Appropriate figures are also drawn for selected tables in improving the understanding of the readers.

Scaling technique is mainly employed to convert the qualitative information into a quantitative one. In this study a five-point scaling technique also known as Likert scaling is engaged to assess the depth of agreeability of various category of respondents on the different aspects relating to Project Management System and SWOT analysis of AI in project Management within DPSUs. Average score is calculated to assess the level of opinion / agreeability of the various category of respondents on the different aspects relating to project management practices of DPSUs.

3. Data Analysis and Findings

3.1 Profile of Respondents

3.1.1 Designation

The Management level wise distribution of respondents is selected for the study. The level considered are lower, middle and upper level Management. The Figure 1 presents a pictorial representation on the bifurcation of the respondents based on Management Level.

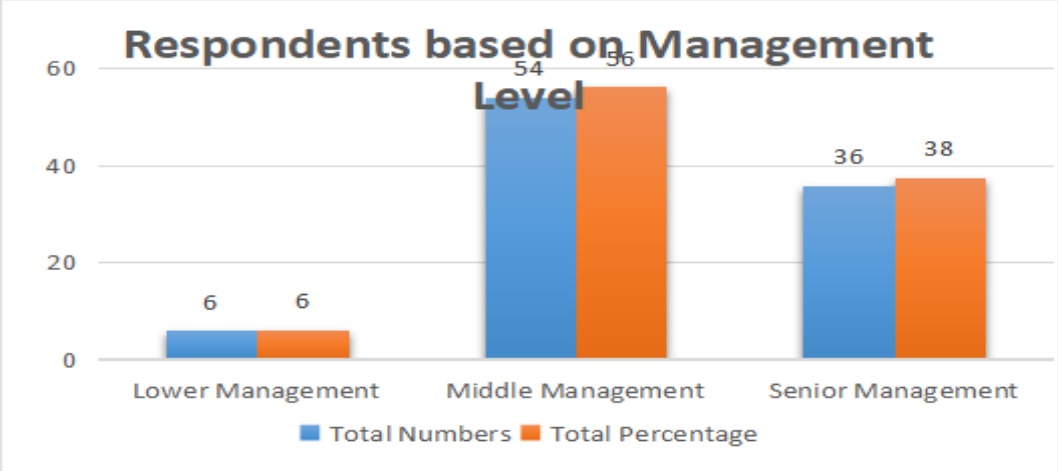

Figure 1 Bifurcation of respondents based on Management Level

It is found from Figure 1 that 6 (6%) of the respondents are Lower Management Level, 54 (56%) of the respondents are Middle Management Level and 36 (38%) are Senior Management Level.

It is concluded that maximum (56%) of the respondents are from Middle Management Level.

3.1.2 Experience

Figure 2 is a pictorial representation on the distribution of respondents with their work experience.

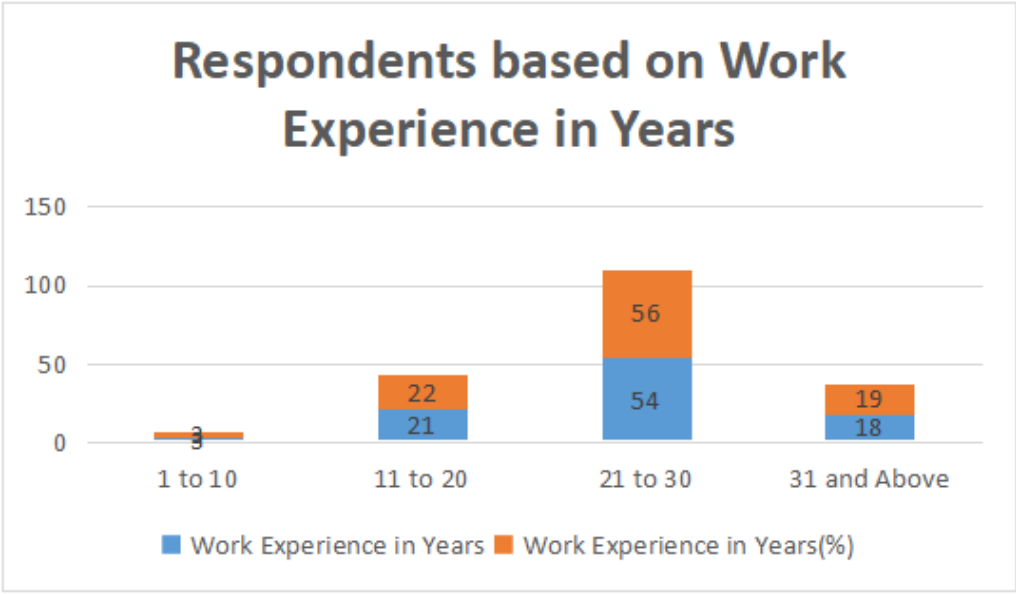

Figure 2 Work experiences of the respondents

It is found from Figure 2 that 3 (3%) of the respondents have an experience upto 10 years, 21 (22%) upto 20 years, 54 (56%) have an experience upto 30 years and 18 (19%) respondents have an experience above 30 years.

It is concluded that the majority of the respondents (56%) have more than 20 years of experience.

3.1.3 Educational Profile

Figure 3 shown below is a pictorial representation of the distribution of respondents based on their work experience.

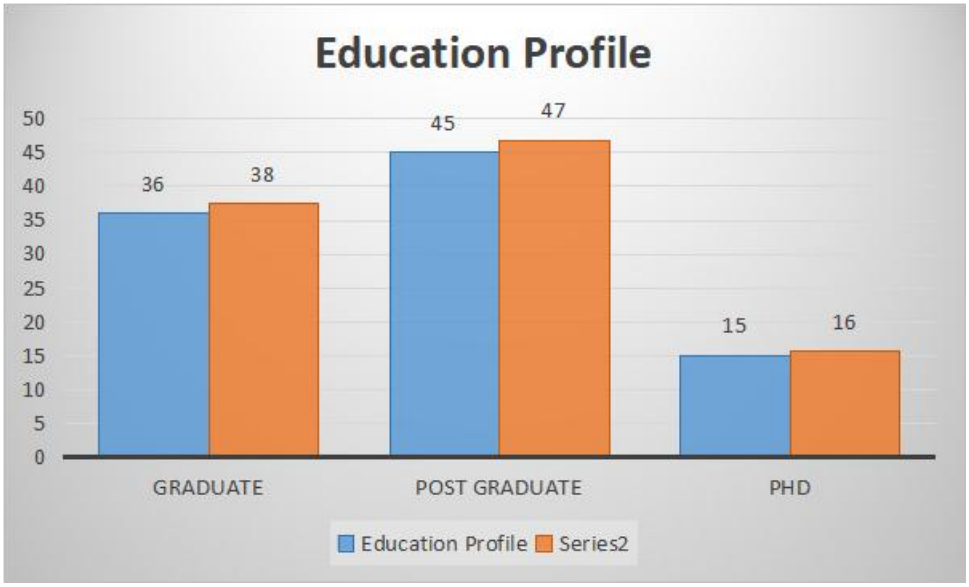

Figure 3 Education Profile

It is found from Figure 3 that 36 (38%) of the respondents are Graduate, 45 (47%) are Post Graduate and 15 (16%) are PHD education profile

It is concluded that the majority of the respondents (47%) are of Post Graduate education profile.

3.2 Project Management Knowledge

3.2.1 Project Management Knowledge – Percentage Analysis

The Table 1 examine the project management knowledge and practices being followed by Project executors / Managers working in Defence Public Sector Units

The insight about the project management knowledge like project definition, cost estimation of project, Risk and Risk management, cost overrun, stakeholder management were identified w.r.t DPSU and compared with personal profile.

Table 1 Project Management Knowledge

S.No.	Variables	Strongly Agree	Agree	Undecided	Disagre	Strongl
1	Project Management is need of hour for Project Success	72(75)	21(22)	0(0)	0(0)	3(3)
2	Project is defined as a temporary endeavour undertaken to create a unique product, service or result	42(44)	42(44)	6(6)	3(3)	3(3)
3	While estimating the project cost ant duration, past project data (estimates, risks, assumptions etc) of similar projects executed in the Organization is often refereed.	30(31)	66(69)	0(0)	0(0)	0(0)
4	Operations are different than Projects i.e Operation is Ongoing and Repetitive	33(34)	48(50)	15(16)	0(0)	0(0)
5	Best Definition of Risk in Project is event which will impact project positively or negatively	36(38)	39(41)	0(0)	15(16)	6(6)
6	Risk Management are planned to Increase the Probability of positive event and decrease the Probability of negative event	51(53)	42(44)	3(3)	0(0)	0(0)
7	Cost overrun is major risk in execution of DPSU Projects	27(28)	39(41)	18(19)	9(9)	3(3)
8	Stakeholder Management is a key for project success	39(41)	57(59)	0(0)	0(0)	0(0)

[Note: Values in () are in percentage]

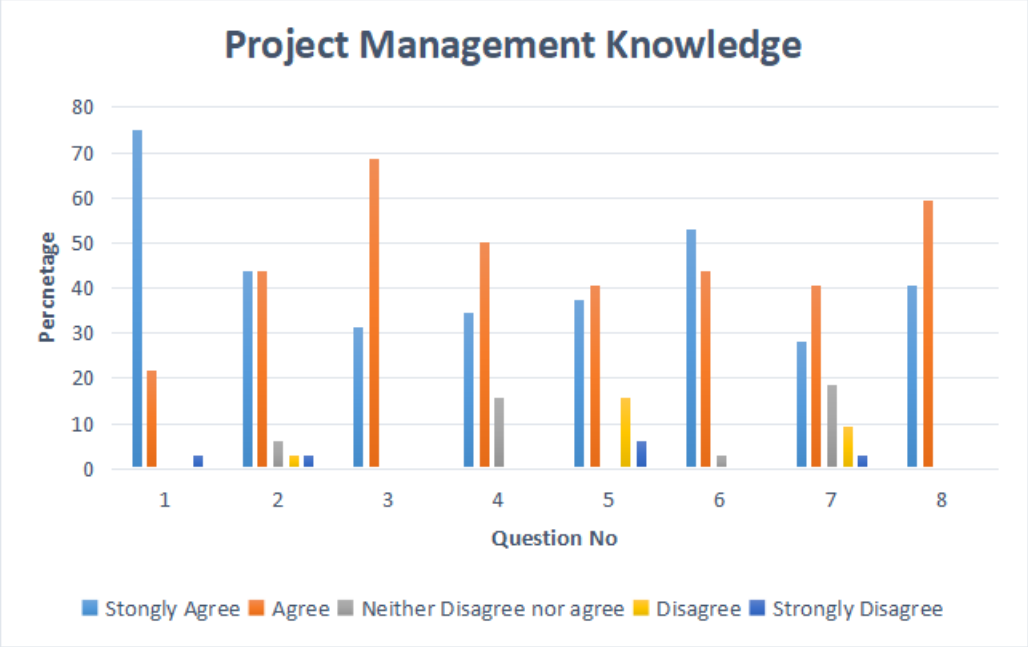

Figure 4 Project Management Knowledge – Percentage Analysis

Following findings emerged from Table 1 and Figure-4

1. Majority of the respondents 72 (75%) have strongly agreed, and 21(22%) ofthem have agreed, on the requirement of Project Management for Project Success.
2. 42 (44%) of the respondents strongly agreed and 42(44%) agreed that Project is as a temporary endeavour undertaken to create a unique product or service or result.
3. 30 (31%) of the respondents strongly agreed and 66(69%) agreed that while estimating the project cost ant duration, past project data (estimates, risks, assumptions etc) of similar projects executed in the Organization is often refereed.
4. 33 (34%) of the respondents strongly agreed and 48(50%) agreed that Operations are different than Projects i.e Operation is Ongoing and Repetitive.
5. 36 (38%) of the respondents strongly agreed and 39(41%) agreed that Best Definition of Risk in Project is event which will impact project positively or negatively.
6. 51 (53%) of the respondents strongly agreed and 42(44%) agreed that Risk Management are planned to Increase the Probability of positive event and decrease the Probability of negative event.
7. 27 (28%) of the respondents strongly agreed and 39(41%) agreed that Cost overrun is major risk in execution of DPSU Projects event.
8. 39 (41%) of the respondents strongly agreed and 57(59%) agreed that Stakeholder Management is a key for project success.

It is concluded that all the respondents are well versed with the Project Management Knowledge and it practices.

3.2.2 Project Management Knowledge – Average Score Analysis

Table-2 is the Average Score Analysis which depicts the view of the respondents based on the Personal Factors like occupational position and number of years of experience of the respondents on the variables relating to Project Management Knowledge through a Five-point Likert Scaling.

Table 2 Personal Factors and Project Management Knowledge

S.No.	Variables	Management Level						
		Lower Management	Middle Manage	Senior Manag	1 to 10	11 to 20	21 to 30	31 and Above
1	Project Management is need of hour for Project Success	4.5	4.8	4.1	4.0	4.7	4.6	4.8
2	Project is defined as a temporary endeavour undertaken to create a unique product, service or result	4.5	4.2	3.7	4.0	4.3	4.1	3.0
3	While estimating the project cost ant duration, past project data (estimates, risks, assumptions etc) of similar projects executed in the Organization is often refereed.	4.5	4.4	4.2	4.0	4.7	4.2	4.2
	Operations are different than Projects i.e Operation is Ongoing and Repetitive	4.5	4.1	3.8	5.0	4.4	3.9	3.2
5	Best Definition of Risk in Project is event which will impact project positively or negatively	5.0	4.0	3.7	5.0	3.9	3.8	4.0
6	Risk Management are planned to Increase the Probability of positive event and decrease the Probability of negative event	5.0	3.6	3.6	5.0	4.7	4.1	3.7

S.No.	Variables	Management Level						
		Lower Management	Middle Manage	Senior Manag	1 to 10	11 to 20	21 to 30	31 and Above
7	Cost overrun is major risk in execution of DPSU Projects	5.0	4.3	3.9	4.0	4.1	3.5	4.2
8	Stakeholder Management is a key for project success	4.5	3.6	3.3	4.0	4.4	4.2	3.7

From Table 2, it is observed that the average analysis is within 3 to 5 and hence can be concluded that all the respondents are well versed with the Project Management Knowledge and it practices.

3.3 Artificial Intelligence Knowledge

3.3.1 Artificial Intelligence Knowledge – Percentage Analysis

The Table 3 explore the understanding of Artificial Intelligence knowledge of Project executors / Managers of Defence Public Sector Units.

The perception about the Artificial knowledge such as Artificial Intelligence definition, Artificial Intelligence applications, Artificial Intelligence algorithms, Artificial Intelligence platform requirements were captured and compared with personal profile.

Table 3 Artificial Intelligence Knowledge

S.No	Variables	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1	Artificial Intelligence (AI) has become one of the most deeply researched and developed technologies in recent years	39(41)	57(59)	0(0)	0(0)	0(0)
2	In AI the machine basically learns from its mistake so if the prediction is wrong, it will only get more accurate in the future.	39(41)	54(56)	3(3)	0(0)	0(0)

S.No	Variables	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
3	The data should be organized (structured like a database) for AI Applications	21(23)	45(48)	9(10)	15(16)	3(3)
4	Various algorithms are used for development of AI Model	24(25)	45(47)	15(16)	12(13)	0(0)
5	AI platform depends on ability organization to capture right data at different stages in a	33(34)	63(66)	0(0)	0(0)	0(0)
6	Artificial Intelligence is about making a machine Intelligent	30(31)	66(69)	0(0)	0(0)	0(0)
7	Ways to achieve AI is Machine Learning and Deep Learning	30(31)	48(50)	9(9)	9(9)	0(0)

[Note: The value in brackets are in percentage]

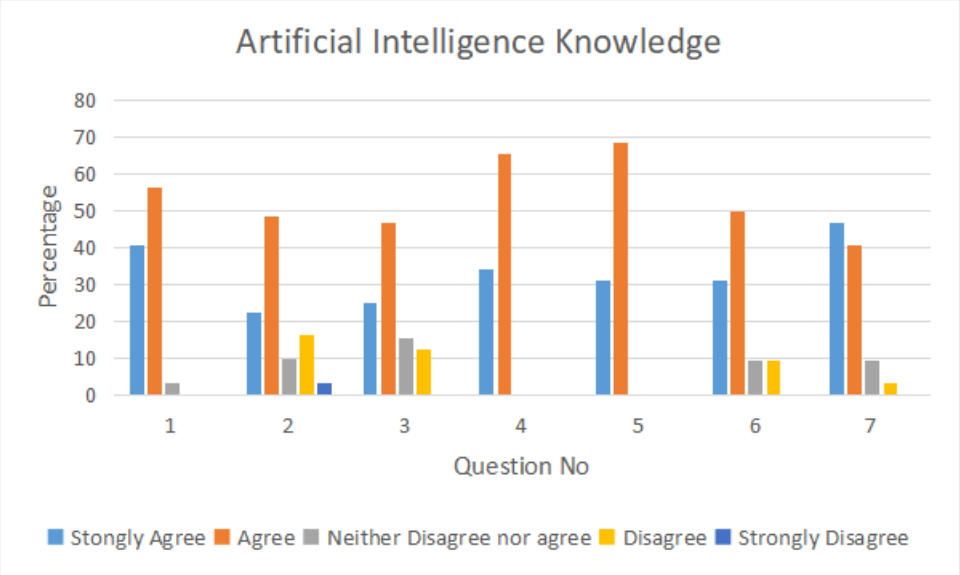

Figure 5 Artificial Intelligence Knowledge – Percentage Analysis

Following findings emerged from Table 3 and Figure-5

1. Majority of the respondents 39 (41%) have strongly agreed, and 57(59%) of them have agreed that Artificial Intelligence (AI) has become one of the most deeply researched and developed technologies in recent years

2. 39 (41%) of the respondents strongly agreed and 54(56%) agreed that in AI the machine basically learns from its mistake so if the prediction is wrong, it will only get more accurate in the future.
3. 21(23%) of the respondents strongly agreed and 45(48%) agreed that the data should be organized (structured like a database) for AI Applications.
4. 24(25%) of the respondents strongly agreed and 45(47%) agreed that various algorithms are used for development of AI model.
5. 33(34%) of the respondents strongly agreed and 63(66%) agreed that AI platform depends on ability organization to capture right data at different stages in a project.
6. 30(31%) of the respondents strongly agreed and 66(69%) agreed that Artificial Intelligence is about making a machine Intelligent.
7. 30(31%) of the respondents strongly agreed and 48(50%) agreed that Ways to achieve AI is Machine Learning and Deep Learning.

It is concluded that all the respondents are well versed with the Artificial Intelligence Knowledge and its applications.

3.3.2 Artificial Intelligence Knowledge – Percentage Analysis

The Average Score Analysis is a tool to measure the opinion of respondents based on the Personal Factors like occupational status and number of years of experience of the respondents akining to Artificial Intelligence Knowledge with Five-point Likert Scaling.

Table-4: Personal Factors and Artificial Intelligence Knowledge

S.No.	Variables	Management Level						
		Lower Management	Middle Manage	Senior Mana	1 to 10	11 to 20	21 to 30	31 and Above
1	Artificial Intelligence (AI) has become one of the most deeply researched and developed technologies in recent years	4.5	4.1	4.2	4.0	4.7	4.3	4.2
2	In AI the machine basically learns from its mistake so if the prediction is wrong, it will only get more accurate in the future.	4.5	4.2	3.9	4.0	4.0	3.0	3.3
3	The data should be organized (structured like a database) for AI Applications	4.5	3.4	2.9	4.0	4.1	3.6	3.8

S.No.	Variables	Management Level						
		Lower Management	Middle Manage	Senior Mana	1 to 10	11 to 20	21 to 30	31 and Above
	Various algorithms are used for development of AI Model	4.5	3.7	3.2	4.0	4.7	4.1	3.3
5	AI platform depends on ability organization to capture right data at different stages in a project	4.5	4.1	3.9	4.0	4.4	4.2	4.4
6	Artificial Intelligence is about making a machine Intelligent	4.5	4.1	3.8	4.0	4.1	3.7	3.7
7	Ways to achieve AI is Machine Learning and Deep Learning	4.5	3.8	3.6	4.0	4.6	4.3	4.2

From Table 4, it is observed that the average analysis is within 3 to 5 and hence can be concluded that all the respondents are well versed with the Artificial Intelligence Knowledge and its applications.

3.4 Artificial Intelligence in Project Management

3.4.1 Artificial Intelligence in Project Management – Percentage Analysis

Table 4 explore the understanding of usage of Artificial Intelligence in Project Management of Project executors / Managers of Defence Public Sector Units.

The specific requirements for AI implementation in Project Management of Project executors/Managers of Defence Public Sector Units were captured and compared with personal profile.

Table 5 Artificial Intelligence in Project Management

		Strongly	Agre	Undec	Disagr	Strong
1	AI in Project Management will help project managers to take smart decisions and effectively manage the triple constraints (Cost, Time , Quality) of project	21(22)	60(63)	6(6)	9(9)	0(0)

2	AI in Project Management will automate mundane tasks and understand key project performance parameters	18(19)	57(59)	21(22)	0(0)	0(0)
3	AI in Project Management will take over basic project management tasks, like reminding team members of pending status updates	33(34)	60(63)	3(3)	0(0)	0(0)
4	AI in Project Management will have to assess proposed project plans based on historical data and past team performances	33(34)	63(66)	0(0)	0(0)	0(0)
5	AI in Project Management will Highlight potential scheduling conflicts	21(22)	63(66)	6(6)	6(6)	0(0)
6	Artificial Intelligence may completely transform the Project Management in coming years	9(9)	78(81)	9(9)	0(0)	0(0)
7	AI based systems are being used in your organisations	21(22)	60(63)	15(16)	0(0)	0(0)

[Note: The value in brackets are in percentage]

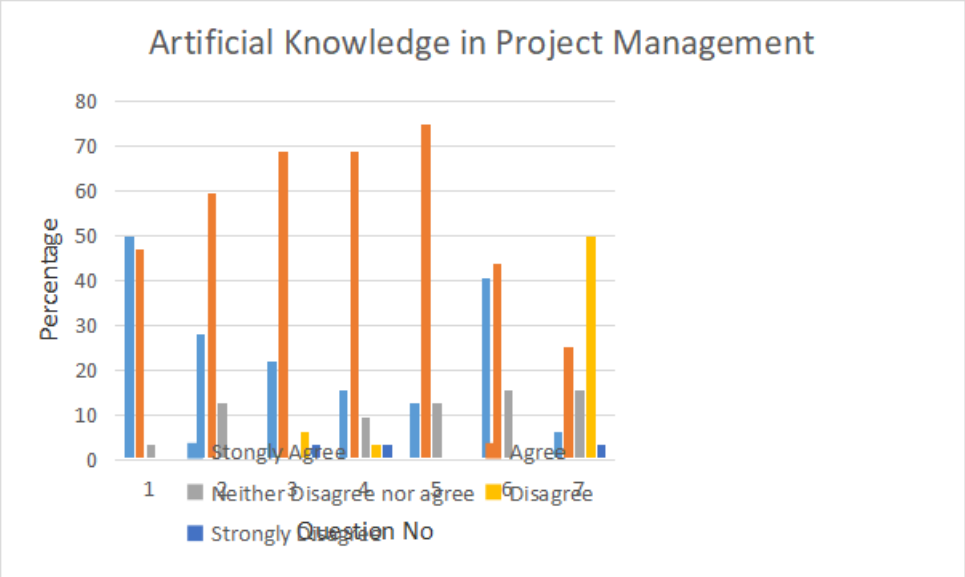

Figure 6: Artificial Intelligence in Project Management Knowledge – Percentage Analysis

Following findings emerged from Table 5 and Figure 6

1. Majority of the respondents 21(22%) strongly agreed, and 60(63%) of them agreed that AI in Project Management will aid project managers and executors for smart decisions aiding effectively management of the triple constraints (Cost, Time, Quality) of project
2. 57 (59%) of the respondents strongly agreed and 21(22%) are neutral that AI in Project Management will automate routine tasks and understand key project performance values.
3. 33(34%) of the respondents strongly agreed and 60(63%) agreed that AI in Project Management will do basic project management tasks, like reminding pending status and status updates to the project team members.
4. 33(34%) of the respondents strongly agreed and 63(66%) agreed that AI in Project Management will have to measure future project plans based on past historical data and \team performances
5. 21(22%) of the respondents strongly agreed and 63(66%) agreed that AI in Project Management will highlight potential scheduling conflicts
6. 9(9%) of the respondents strongly agreed and 78(81%) agreed that Artificial Intelligence may completely transform the Project Management in coming years
7. 21(22%) of the respondents strongly agreed and 60(63%) agreed that AI based systems are being used in your organisations

It is concluded that all the respondents have understanding of specific requirements for AI implementation in Project Management.

3.4.2 Artificial Intelligence in Project Management – Average Score Analysis

The Average Score Analysis aid to measure the views of the respondents based on the Personal Factors like occupational status and total number of years of experience of the respondents on the variables relating to specific requirements of Artificial Intelligence in Project Management with Five-point Likert Scaling.

Table-6 Personal Factors and Artificial Intelligence in Project Management

S.No.	Variables	Management Level						
		Lower Management	Middle Manage	Senior Mana	1 to 10	11 to 20	21 to 30	31 and Above
1	AI in Project Management will help project managers to take smart decisions and effectively manage the triple constraints	4.5	4.0	4.1	4.0	4.7	4.2	3.5

2	AI in Project Management will automate mundane tasks and understand key project performance parameters	4.5	4.2	4.1	4.0	4.4	4.0	4.2
3	AI in Project Management will take over basic project management tasks, like reminding team members of pending status updates	4.5	3.9	3.8	4.0	4.3	3.7	3.2
	AI in Project Management will have to assess proposed project plans based on historical data and	4.5	3.8	3.5	4.0	4.1	3.8	3.8
5	AI in Project Management will Highlight potential scheduling conflicts	4.5	3.7	3.5	4.0	4.0	3.7	3.3
6	Artificial Intelligence may completely transform the Project Management in coming years	4.5	3.6	3.8	4.0	4.3	4.3	3.8
7	AI based systems are being used in your organisations	4.5	4.1	3.7	4.0	2.7	2.7	2.2

From Table 6, it is observed that the average analysis is within 3 to 5 and hence can be concluded that all the respondents are well versed with the Usage of Artificial Intelligence in Project Management.

4. Conclusion

Based on the analysis carried out it is concluded that:

- Project Managers and Executors are well versed with the Project Management and Artificial Intelligence Knowledge and it practices
- Project Managers and Executors have understanding of specific requirements of Artificial Intelligence implementation in Project Management.

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