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CRITICAL INVESTIGATION ON THE CURRENT WORK PRACTICES, ADVANCEMENTS AND FUTURE DIRECTION TOWARDS MANUFACTURING COMPANIES IN ANDHRA PRADESH

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Abstract

It would be quite naive to forego the use of current technology given that it makes it possible to instantly link individuals in different parts of the globe. It is common knowledge that the extensive usage of a variety of electronic devices in the workplace has resulted in significant shifts in the dynamics of all workplaces. The internet, cell phones, emails, and text messages are only some of the forms of electronic communication that are readily available to workers, and they are encouraged to make use of them. The development of new technologies is increasingly being recognised as a "organisational actor" that has the potential to improve an organization's access to competent employees. The nature of labour itself is going to undergo significant transformations as a result of the fourth industrial revolution. Despite the fact that automation will very certainly render certain jobs obsolete, it will almost certainly also render many others obsolete as well. The "nonroutine and cognitive" sector, in which there is a larger demand for abilities that are difficult to automate, is where there is a greater likelihood that new employment will be created.

The term "Industry 4.0" (I4.0) has been the most popular one to use when referring to recent changes in the manner in which factories perform their functions. The research conducted on Industry 4.0 has been concentrated on the more technical components, while the social problems about the fourth industrial revolution have been largely ignored. The goal of this paper is to conduct an investigation of the ways in which Industry 4.0 has affected the labour force. Recently, conversations on a variety of levels, including academic, managerial, and governmental, have moved their attention to Industry 4.0 and sustainability. The fourth industrial revolution, also known as Industry 4.0, has the potential to improve the efficiency of processes, increase environmental sustainability, and reduce waste creation by making more effective use of resources. On the other side, it might result in a greater use of energy as well as the buildup of waste, such as outdated technological equipment.

Keywords: Industry 4.0, Current Work Practices, Sustainability, Chi squareanalysis

Introduction

A rise in productivity and a stronger emphasis on cooperation may all be attributed to the use of technology in the workplace. Despite this, studies have shown that employees are becoming more frustrated as a result of the widespread usage of technology in the workplace. The increased availability brought about by technological advancements may make it more difficult for workers to get in contact with their manager whenever they want to do so. In the workplace,

low productivity and reluctance to embracing new technologies are often the result of disruptions brought on by technology. It would seem that the same tools and technology that were supposed to reduce cognitive stress are really making the problem worse. These specifics highlight the sensation of being overtaken by technological advancements. The excessive use of technology by many causes them to suffer from a condition known as "techno-stress" or "techno-invasion." It's possible that the pervasiveness of technology in both the workplace and the employees' personal lives is to blame for the detrimental impact that technology has on workers' productivity.

In addition to the advances in science that occurred throughout each industrial revolution, there were also significant economic and societal shifts. The fast advancement of technology has caused widespread changes in people's day-to-day activities as well as their places of work. At this very moment, we are in the midst of the fourth industrial revolution, also referred to as Industry 4.0. During the Hannover Trade Fair in 2011, the term "Industry 4.0" was first used. The same year saw the first public presentation of the fundamental concepts underlying I4.0. Their significance has been acknowledged by the German government, which is why it has included them into its "High-Tech Strategy 2020 Action Plan." It has been hypothesised that technologies such as big data, cloud computing, cyber-physical systems (CPSs), the internet of things (IoT), the internet of services (IoS), and 3D printing will exist in the age of I4.0. I4.0's underlying assumption is supported by a wide range of technologies, including embedded systems, sensors, semantic machine-to-machine communication (achieved through ontology engineering and other techniques), cyber-physical systems, and the Internet of Things. Industry 4.0 (I4.0) technologies will make it possible to fully integrate equipment, gadgets, manufacturing facilities, and data storage networks via the use of tools provided by information and communications technology (ICT). This makes it possible to network the factory, which eventually results in the creation of an intelligent environment. The implications of this will be felt all throughout the supply chain, from the point of manufacture to the point of marketing, from outbound logistics to incoming logistics, and from services to outbound services. As a direct consequence of the Fourth Industrial Revolution, both technological advancements and increases in worker productivity may be expected. This study's objective is to evaluate how Influence 4.0 (I4.0) impacts workers in as many different contexts as feasible.

Despite the "disruptive" image of I4.0 technologies, it is anticipated that all users will experience the advantages of these technologies in the form of better productivity, enhanced and more personalised products, a more pleasant workplace, and other such improvements (industrial firms, organisations, consumers, etc.). The only significant challenge seems to be obtaining work that is suited for one's skills. The Boston Consulting Group (BCG), for one, anticipates a considerable growth in the automation of previously manual operations all over the world, with near-complete saturation by the end of the 2020s. This prediction was made by the Boston Consulting Group (BCG).

Literature Review

The anticipation that businesses would quickly become more efficient as a consequence of the industrial revolution makes it important to discuss how the effects of Industry 4.0 would have

on individuals and the jobs that they do. Human capital is the most significant asset that a company has because it enables enterprises to fulfil both the present and future requirements of the market, accomplish their objectives, and obtain a competitive edge. Because of the new ways in which businesses operate in the age of I4.0, the manner by which future workers will be educated and acquire the necessary competences and abilities will also change dramatically. This is because of the new methods in which firms run. Alterations are also possible to be made to human resource management (HRM) and the employment market. When thinking about the issue of an employee's function in a smart factory and the associated modifications that need to be made to workers' professional qualifications and competencies, it appears that the digital abilities of an employee and the process of continuing professional development (CPD) seem to be of particular relevance.

The widespread use of automation, robotics, and digitalization will have significant repercussions, not only on the nature and value of human ability, but also on the nature and value of human employment and professions. These changes are expected to take place over the next few decades. As a consequence of the fast spread of Industry 4.0, personnel in the manufacturing sector will be required to adjust to new jobs and skill sets. As a result of I4.0, many opportunities will present themselves; however, there are also risks that need to be taken into consideration, such as the social and ethical ramifications of adopting I4.0 and the impact that a lack of management structural changes will have on the job market. Both of these ramifications are important to consider. It would seem that the largest difficulty that I4.0 faces is not one that is caused by technology causes, but rather one that is caused by human factors.

It would seem that several nations and sectors are interested in the idea behind Industry 4.0. There are several examples of similar programmes all throughout the globe, including Germany's "Industrie 4.0," China's "Made in China 2025," the United Kingdom's "Smart Factory," the United States' "Advanced Manufacturing Partnership," and a great deal more besides. Several governments and corporations across the world are now investigating the viability of implementing I4.0 on a global scale. However, putting cutting-edge technologies like those brought about by I4.0 into practise may be challenging and difficult in regions or sectors that are economically underdeveloped or that have not made enough progress in terms of technical development.

The concept of Industry 4.0, as presented by Maisiri et al. (2019), is predicated on the advancement of technology and has had far-reaching consequences across all areas of business. Examples of technology that fall under the umbrella of Industry 4.0 include things like the Internet of Things (IoT), artificial intelligence (AI), machine learning, cloud computing, and analytics.

ICT is what sets Industry 4.0 unique from earlier industrial revolutions, according to Chowdhury and Murzi; this is accomplished via automation, an increase in the number of network connections, and improved communication (2020). Collaboration in the workplace and overall productivity both increased as a result. Similar findings were reported by Dalenogare et al. (2018), who discovered that industry 4.0 technologies assisted businesses in operating more effectively and were favourably connected with the anticipated industrial support. According

to Jnior and colleagues, Industry 4.0 improved worker safety in the industrial sectors, decreased the number of accidents that occurred on the job, and boosted creative output (2021). According to Cimini et al., the implementation of Industry 4.0 technologies leads to the creation of new job profiles and raises the bar for the required level of technical knowledge in businesses (2020).

According to Ras et al. (2017), the advent of Industry 4.0 presents a significant obstacle for commercial enterprises. Enhanced capabilities were required in order to keep up with the fast-paced world of today. They demand the ability to think critically and make decisions in a way that is appropriate for an imaginative setting. The disruption that has been generated by technologies such as Industry 4.0 and Education 4.0 has also been investigated by Mohd Adnan et al. (2019). [Citation needed] [Citation needed] The authors claim that in this day and age of industry 4.0, when new technologies are always being introduced, it is essential to continuously enhance one's knowledge and talents in order to maintain one's employment. The authors conducted research on the many ways in which English teachers working in public schools in Malaysia may make use of the resources provided by Education 4.0. The adoption of education 4.0 was met with a number of obstacles, including financial restrictions, a lack of resources, and insufficient guidance.

According to the findings of Brahma and colleagues (2020), the digital workplace presents challenges such as the dispersion of jobs, the separation of team members, and misunderstanding over the value of labour and results. Encouragement from teachers, shared objectives, empathy, and unrestricted access to knowledge were all proposed as viable ways of reducing these problems and maximising the beneficial impacts of a technologically advanced workplace.

Research hypothesis

- There is no statistical association between increasing productivity through technology and enhancing current work practices
- There is no statistical association among upskilling the individuals to adapt to changing business needs and enhancing current work practices& advancements
- There is no statistical associationbetween better collaboration and enhancing current work practices & advancements

Research Methodology and Design

In this piece, the researcherused quantitative methodology to the task of analysing and researching the elements that influence the productivity of employees. For the sake of this study, employee performance will be referred to as the dependent variable, while the many other factors that might have an impact on employee performance will be referred to as the independent variables. "Explaining occurrences by accumulating numerical data that are analysed using different conceptually based methodologies (in particular statistics)" is the goal of this kind of research.

The respondents were chosen through convenience sampling, the sample population are the employees in manufacturing companies in selected cities of Andhra Pradesh, nearly 150 questionnaire were issued and 137 responses were received. The data collected were analysed

using statistical tools like percentage rate analysis, correlation analysisand chi square test.

Data Analysis

Table 1: Percentage rate analysis

Demographic	Particulars	Frequency	Percent
Gender Category	Male	92	67.20
	Female	45	32.80
Age Category	Less than 30 years	37	27.00
	31 - 40 years	52	38.00
	41 - 50 years	17	12.40
	Above 50 years	31	22.60
Typeoffamily	Joint family	59	43.10
	Nuclear family	78	56.90
Currently living in	Metro City	82	59.90
	Non-metro City	55	40.10
Management Cadre	Lower-level management	40	29.20
	Middle level management	82	59.90
	Process Head	15	10.90
Total experience	Less than 3 years	35	25.50
	4 - 8 years	35	25.50
	8 - 12 years	26	19.00
	12 - 16 years	9	6.60
	Above 16 years	32	23.40

According to those statistics, males accounted for 67.20 percent of the population, while women made up 50 percent of the total population. There were 38.00% of the population who were younger than 30 years old, 27.00% of those who were older than 50 years old, and 50.00% of the population who were between the ages of 41 and 50. In addition, 59.90% of people now live in a metropolitan region, while the remaining 40.10% live in a non-metropolitan area; and 56.90% of people belonged to a nuclear family, while the remaining 40.10% belonged to a joint family.The remaining 29.20 percent were either in middle management or lower management, while the remaining 59.90 percent were process heads.

Correlation analysis

Table 2: Correlation analysis

	Increasing Productivity	Upskilling the individuals	Better collaboration	Current work practices and advancements
Increasing Productivity	1	.897	.844	.836
Upskilling the individuals	.897	1	.855	.849
Better collaboration	.844	.855	1	.766
Current work practices and advancements	.836	.849	.766	1

According to Table 2, there is a favourable relationship between modern workplace innovations and increased levels of cooperation (+0.766), as well as a positive relationship between productivity and these innovations (+0.836). Additionally, there is a positive relationship between contemporary workplace innovations and upskilling people (+0.849). As a direct result of this, the positive values of all of the correlation coefficients have grown.

Chi square analysis

Table 3: Cross tabulation between Increasing Productivity and Current work practices and advancements

	Productivity				
Current work practices	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Strongly Disagree	2	5	0	0	0
Disagree	1	10	2	0	0
Neutral	0	0	14	2	4
Agree	0	0	1	9	30
Strongly Agree	0	0	0	12	45
Chi-Square Tests	Value	df	P Coeff		
Pearson Value	207.458a	16	0.00		
Likelihood value	160.835	16	0.00		

From table 3, it is noted that the p coefficient is 0.00 hence alternate hypothesis is accepted hence concluded that there is a statistical association between increasing productivity through technology and enhancing current work practices

Table 4: Cross tabulation between Upskilling the individuals and Current work practices and advancements

	Upskilling the individuals				
Current work practices	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Strongly Disagree	1	6	0	0	0
Disagree	6	5	2	0	0
Neutral	0	0	11	3	6
Agree	0	0	1	9	30
Strongly Agree	0	0	0	2	55
Chi-Square Tests	Value	df	P Coeff		
Pearson Value	211.843a	16	0.00		
Likelihood value	159.453	16	0.00		

From table 4, it is noted that the p coefficient is 0.00 hence alternate hypothesis is accepted hence concluded that there is a statistical association betweenupskilling the individuals to adapt to changing business needs and enhancing current work practices & advancements

Table 5: Cross tabulation between better collaboration and Current work practices and advancements

	Better collaboration				
Current work practices	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Strongly Disagree	3	4	0	0	0
Disagree	5	6	1	1	0
Neutral	0	0	13	1	6
Agree	0	0	1	20	19
Strongly Agree	0	0	2	22	33
Chi-Square Tests	Value	df	P Coeff		
Pearson Value	185.355a	16	0.00		
Likelihood value	143.357	16	0.00		

From table 5, it is noted that the p coefficient is 0.00 hence alternate hypothesis is accepted hence concluded that there is a statistical association betweenbetter collaboration and enhancing current work practices & advancements

Discussion

It is possible that Industry 4.0 will make it simpler for parties involved in the supply chain to communicate data in order to carry out closed-loop supply chain activities. A team of investigators just shown this to be the case (Gu et al., 2018). The closed loop viewpoint has been extended to include the principles of circular economics. Research on the benefits and problems given by Industry 4.0's technical developments in the context of a circular economy is the primary emphasis of these works (Chauhan et al., 2019; Rajput and Singh, 2019). The notion of a circular economy might theoretically and possibly be helped by Industry 4.0, particularly via its capabilities in the area of big data (de Sousa Jabbour et al., 2018a; Jabbour et al., 2019). When an item approaches the end of its useful life, the information that has been obtained via the Internet of Things (IoT), such as how it is being used or where it is situated, may be utilised to simplify the processes of refurbishment or recycling. Other writers investigate how digital product data and additive manufacturing, which allow for more flexible and globally dispersed production, could help smooth the transition to sustainable and circular production (Turner et al., 2019).

Despite the fact that many other levels of analysis have been considered, the majority of research have focused on the interactions that exist inside and between organisations in regards to Industry 4.0 and sustainability. In the long term, cloud computing may be able to assist with the administration of greener practises for the management of infrastructure such as buildings, automobiles, and other kinds of infrastructure (Truong and Dustdar, 2012). Long-term improvements in policymaking may be possible if data obtained via digital monitoring are shared among several stakeholders in a system. For the proper preservation and management of this data, sophisticated procedures are required. There are a variety of technological approaches that might be used to successfully support policy decision making, which is crucial for sustainable governance (Milano et al., 2017). When it comes to bringing the technologies of Industry 4.0 into this administration, artificial intelligence (AI) is another helpful component to include.

Conclusion

The nature of work and the influence that employment has on both persons and organisations has been transformed as a result of Industry 4.0. Literacy in the workplace was necessary for employees to accomplish the objectives of industry 4.0. Within the context of industry 4.0, Farrell et al. (2021) investigated workplace literacy in addition to work practises, organisational structure, and organisational practises. They came to the conclusion that employees in the Fourth Industrial Revolution need to have at least some level of reading competency. in the same way that the conventional system of manual labour has been mechanised, roboticized, and algorithmized as a result of Industry 4.0. According to the findings of recent research, it may be difficult for companies to adjust to the changes that are occurring in the workforce today. They took action by providing workers with opportunities for retraining and financial help for higher education, as well as sponsoring initiatives that taught workers about the developing industry 4.0. (Rangraz& Pareto, 2021).

Through the provision of training, employers may assist their staff members in coping with the

rapid advancement of technology. Training makes individuals more comfortable while they are using technology, which decreases the stress that is associated with using it, enhances efficiency, and eventually adds to increased productivity. Effective training that encourages workers to utilise technology more often is what leads to increased frequency of usage (K. J. Harris et al., 2013). The quantity of data that is made accessible to workers grows, but training helps minimise stress and improves their ability to utilise innovative technologies (K. J. Harris et al., 2015). Workers who have received training may experience reduced stress and more productivity on the job (Tarafdar et al., 2007). Those who lack the necessary skills to make effective use of even the most cutting-edge technologies will continue to struggle. It is possible that teacher education programmes that place a focus on the use of technology in the classroom might be one solution to the issue of students being overexposed to electronic gadgets. Improved IT assistance and training not only increases worker productivity but also reduces stress associated to technology. Training encourages employees to work harder at their occupations, which ultimately results in increased production.

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