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An Empirical Study on Industrial Automation: Its Boon and Bane on Employees

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ABSTRACT

The word Automation gives the meaning ‘self dictating’ or ‘a mechanism move by itself’ that derived from the Greek words Auto and Matos where auto means self while Matos means moving Highly automated product realization is an important means for industry to meet competition from low-cost countries, due to relatively high wage costs observed in world. In a time of rapidly changing technologies and shortening product life cycles, many companies are focusing on automation as a means for competing in a more demanding market. word Automation gives the meaning ‘self dictating’ or ‘a mechanism move by itself’ that derived from the Greek words Auto and Matos where auto means self while Matos means moving However, an increased usage of automation does not necessarily result in increased benefits The manufacturing system itself includes both human and technological resources, as well as, procedures, software and facilities.The manufacturing system itself includes both human and technological resources, as well as, procedures, software and facilities. All dependent on each other in a complex combination Consequently, both advanced technical systems and skilled human workers are necessary for successful manufacturing. Therefore, there appears to be a large potential in the area of manufacturing to find appropriate levels of automation. Thereby the correct level of automation can be achieved for the right manufacturing situation as a way of increasing the system robustness.advantages of

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automation are cost reductions, improvement of efficiency, and enhanced competitiveness and productivity The SPSS software by IBM was used to calculate the descriptive statistics. The sample size was 200. Dependent .

KEYWORDS : automation, industry, human, evolution, technologies.

INTRODUCTION

Automation takes a step further mechanisation that uses a particular machinery mechanism aided human operators for performing a task. Mechanisation is the manual operation of a task using powered machinery that depends on human decision making. On the other hand, automation replaces human involvement with the use of logical programming commands and powerful Industrial Automation is the replacement with computers and machines to that of human thinking. The word Automation gives the meaning ‘self dictating’ or ‘a mechanism move by itself’ that derived from the Greek words Auto and Matos where auto means self while Matos means moving .Highly automated product realisation is an important means for industry to meet competition from low-cost countries, due to relatively high wage costs observed in world. In a time of rapidly changing technologies and shortening product life cycles, many companies are focusing on automation as a means for competing in a more demanding market. However, an increased usage of automation does not necessarily result in increased benefits The manufacturing system itself includes both human and technological resources, as well as, procedures, software and facilities. All dependent on each other in a complex combination Consequently, both advanced technical systems and skilled human workers are necessary for successful manufacturing. Therefore, there appears to be a large potential in the area of manufacturing to find appropriate levels of automation. Thereby the correct level of automation can be achieved for the right manufacturing situation as a way of increasing the system robustness.advantages of automation are cost reductions, improvement of efficiency, and enhanced competitiveness and productivity.This empirical study delves into the nuanced interplay between automation technologies and the workforce, exploring both the advantages and challenges posed to employees. As industries increasingly embrace automation to enhance efficiency and output, this research aims to unravel the dual nature of its impact – a boon that propels progress and a potential bane that raises concerns about the future of employment. By scrutinizing the intricate relationship between industrial automation and employees, this study seeks to contribute valuable insights to the ongoing discourse surrounding the evolving dynamics of the modern workplace.

OBJECTIVES

- To analyse that automation can promote efficiency and easiness in industriesTo
- To Determine Automation can reduce the workload on a employee
- To examine that automation can be a cause of unemployment

- To analyse the skills that a employee must develop in order to survive in the automation of industries

REVIEW OF LITERATURE

Sonali Jadhav, Rupali Gawande("[No Title]" n.d.) Really an industrial automation is having positive or negative impact on industry and on employees is a big question. Without automation and technology, we can't imagine life at industry, today there is numerous changes are occurring in industrial sectors for the sake of improving productivity and efficiency in day to day activity.

Social Scientist, 50-63, 1973 ("Website," n.d.) THE determined bid by the Government to introduce computers and other electronic equipment in organised industry, trade and commerce under the guise of technological innovation and managerial revolution has created serious apprehension in the minds of the Indian working class.

Nakul Subramanyam, Basanna Patagundi (Subramanyam and Patagundi 2018)Organizacja i Zarządzanie: kwartalnik naukowy, 2018The role of Artificial Intelligence and Automation has evolved dramatically and exponentially in recent times and there is a great deal of debate on the impact of this on society in general.

Cyrille Schwellnus, Assaf Geva, Mathilde Pak, Rafael Veiel (Schwellnus et al. 2019)
OECD, 2019 The rapid emergence of gig economy platforms that use digital technologies to intermediate labour on a per-task basis has triggered an intense policy debate about the economic and social implications

Amit Tyagi (Tyagi 2016)Available at SSRN 2836438, 2016 Artificial Intelligence (AI) is transforming the nature of almost everything which is connected to human life eg employment, economy, communication, warfare, privacy, security, ethics, healthcare etc. However, we are yet to see its evolution in long-term, whether it's leading humanity towards making this planet a better place to live or a place which is full of disaster. Every technology has its advantages and disadvantages but advantages always outweigh disadvantages for the technology to survive in the market.

Cynthia Estlund ("Website," n.d.)The Yale Law Journal, 254-326, 2018 Will advances in robotics, artificial intelligence, and machine learning put vast swaths of the labor force out of work or into fierce competition for the jobs that remain? Or, as in the past, will new jobs absorb workers displaced by automation? These hotly debated questions have profound implications for the fortress of rights and benefits that has been constructed on the foundation of the employment relationship.

Ahmad Khalid Khan, JA AL ABOUD, Syed Mohammad Faisal ("Website," n.d.)Business & Management Studies 4 (1), 51-58, 2018 In this paper researchers make an attempt by doing intense work that how technological innovations make jobs of accountant so easy from their routine jobs from posting to generating accounting statements etc. with the help of available software and technology in accounting field.

Andy Hines(Hines n.d.) The Futurist 28 (1), 9, 1994
How information technology, or infotech, will change work in the future is discussed. While infotech will lead to more challenging and rewarding jobs, it may also cause a loss of jobs, depersonalization and even boredom.

Seema Sahai, Saurav Lall(Sahai and Lall 2022) Integrating New Technologies In International Business, 71-94, 2022
The technological revolution, which is taking place around us, has created an apprehension amongst people for fear of loss of jobs and increasing inequality amongst them. It has been said that Artificial Intelligence (AI, hereafter) is a reason for generating this fear.

Omvir Gautam, Pooja Agrawal (Gautam and Agrawal 2021)
Critical Issues on Changing Dynamics in Employee Relations and Workforce Diversity, 160-174, 2021 Electronic monitoring surveillance (EMS) has emerged as a mechanism to monitor the behavior of the employees. Fast-growing organizations are adopting this strategy in an expeditious way. EMS deals with the CCTV, internet surfing control, and check on

Peter Neumann Control Engineering Practice 15 (11), 1332-1347, 2007("Communication in Industrial automation—What Is Going On?" 2007)
Fieldbus systems have been successfully introduced into industrial automation. Nowadays, a large community is inventing the usage of Ethernet-based local communication systems in this domain ensuring the real-time, safe and secure behaviour of these systems.

Thomas Bangemann, Stamatis Karnouskos, Roberto Camp, Oscar Carlsson, Matthias Riedl, Stuart McLeod, Robert Harrison, Armando W Colombo, Petr Stluka(Industrial Cloud-Based Cyber-Physical Systems n.d.)
Industrial cloud-based cyber-physical systems, 23-47, 2014
In the last decades, industrial automation has become a driving force in all production systems. Technologies and architectures have emerged alongside the growing organisational structures of production plants.

Richard Shell ("Handbook Of Industrial Automation" n.d.)
CRC press, 2000

Supplies the most essential concepts and methods necessary to capitalize on the innovations of industrial automation, including mathematical fundamentals, ergonometrics, industrial robotics, government safety regulations, and economic analyses.

François Jammes, Harm Smit ("Service-Oriented Paradigms in Industrial Automation" n.d.)
IEEE Transactions on industrial informatics 1 (1), 62-70, 2005
This paper outlines opportunities and challenges in the development of next-generation embedded devices, applications, and services, resulting from their increasing intelligence - it plots envisioned future directions for intelligent device networking based on service-oriented high-level protocols, in particular as regards the industrial automation sector - and outlines the approach adopted by the Service Infrastructure for Real-Time Embedded Networked Applications project, as well as the business advantages this approach is expected to provide.

Valeriy Vyatkin ("Software Engineering in Industrial Automation: State-of-the-Art Review" n.d.)
IEEE Transactions on Industrial Informatics 9 (3), 1234-1249, 2013
This paper presents one perspective on recent developments related to software engineering in the industrial automation sector that spans from manufacturing factory automation to process control systems and energy automation systems.

J-P Thomesse Proceedings of the IEEE 93 (6), 1073-1101, 2005 ("Fieldbus Technology in Industrial Automation" n.d.)
Fieldbus technology in industrial automation is not only relatively complex because of the number of solutions possible, but also, and above all, because of the variety of applications. Ironically, these in turn are responsible for the multitude of solutions available

Frank Lamb
McGraw-Hill Education, 2013 ("Website," n.d.)
A practical guide to industrial automation concepts, terminology, and applications.Industrial Automation: Hands-On is a single source of essential information for those involved in the design and use of automated machinery.

Francesco Basile, Pasquale Chiacchio, Diego Gerbasio
IEEE Transactions on Automation Science and Engineering 10 (4), 990-1003, 2012 ("On the Implementation of Industrial Automation Systems Based on PLC" n.d.)

Industrial automation is largely based on PLC-based control systems. PLCs are today mostly programmed in the languages of the IEC 61131 standard which are not ready to meet the new challenges of widely distributed automation systems.

Ashwani K Gupta, Satish K Arora
Laxmi publications, 2009 ("Industrial Automation and Robotics" n.d.)

F Noble David
Routledge, 2017 (Noble 2017)
Focusing on the design and implementation of computer-based automatic machine tools, David F. Noble challenges the idea that technology has a life of its own. Technology has been both a convenient scapegoat and a universal solution, serving to disarm critics, divert attention, depoliticize debate, and dismiss discussion of the fundamental antagonisms and inequalities that continue to beset America.The manufacturing system itself includes both human and technological resources, as well as, procedures, software and facilities. All dependent on each other in a complex combination Consequently, both advanced technical systems and skilled human workers are necessary for successful manufacturing.

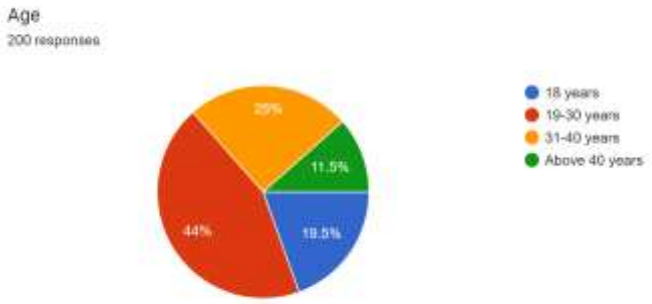
METHODOLOGY

MATERIALS AND METHODS :

This research is an empirical research done by the author. The author visited public places such as bus stands in order to take some surveys to analyze this topic. This research is analyzed by using the sampling method called 'simple random sampling' method .This research is made with a sampling size of 200 responses. The independent variables which are used in this research analysis are age, gender, occupation, educational qualification. The dependent variables which are used in this research analysis are automation promotes easiness and efficiency , automation can reduce the workload of a employee , automation can cause unemployment, qualities that are to be to survive in automation industry .

ANALYSIS:

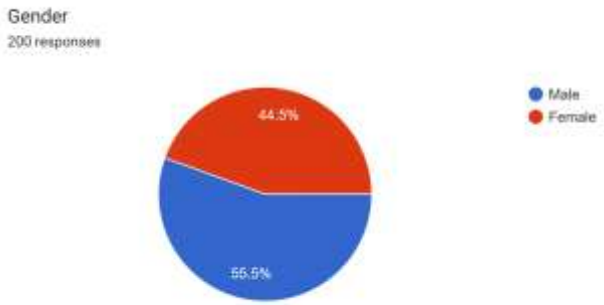
Figure 1:



Legend:

Figure 1 represents the age distribution of the respondents.

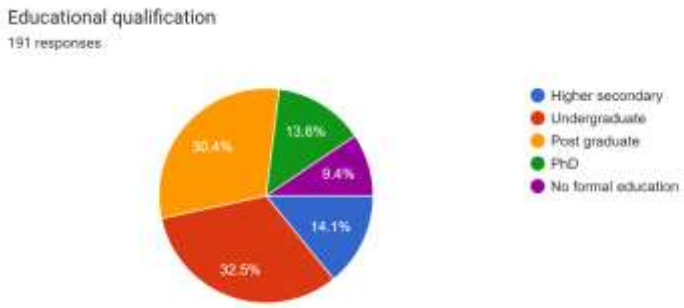
Figure 2:



Legend:

Figure 2 represents the gender distribution of the respondents.

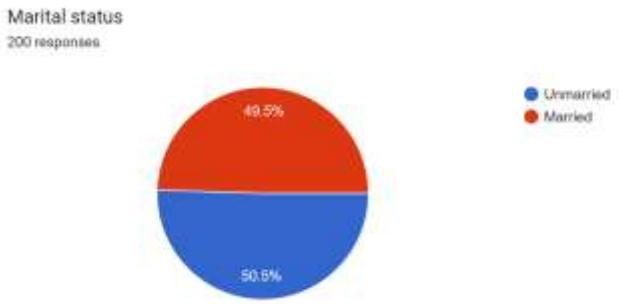
Figure 3:



Legend:

Figure 3 represents the educational qualification of the respondents.

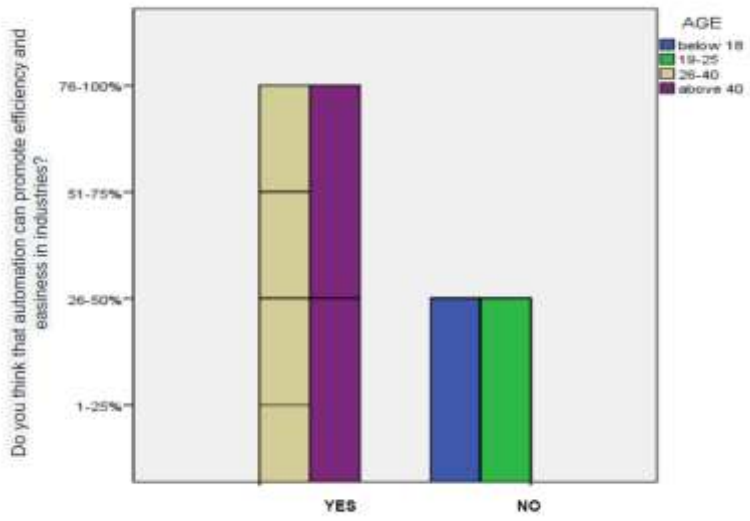
Figure 4:



Legend:

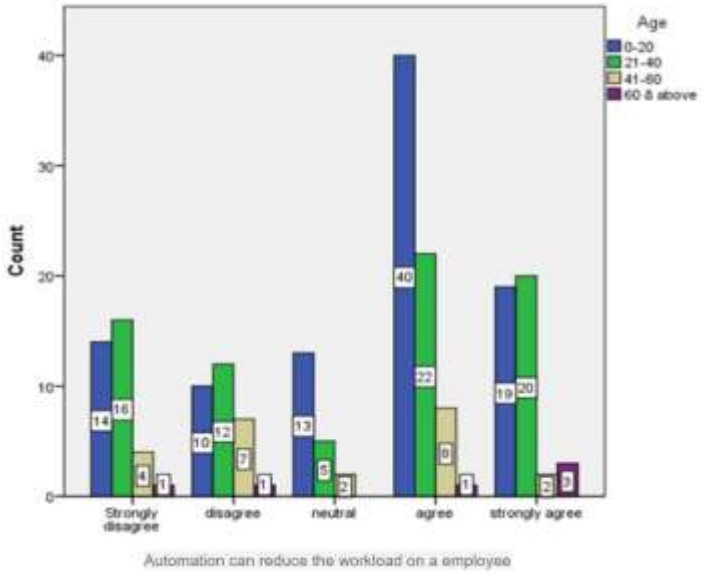
Figure 4 represents the marital status of the respondents.

Figure 5



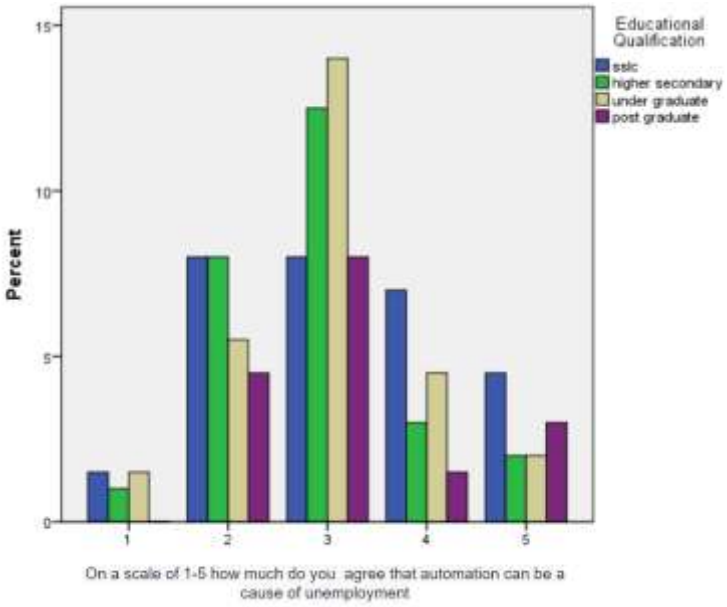
Legend: This figure dependent variable is compared with Age

Figure 6



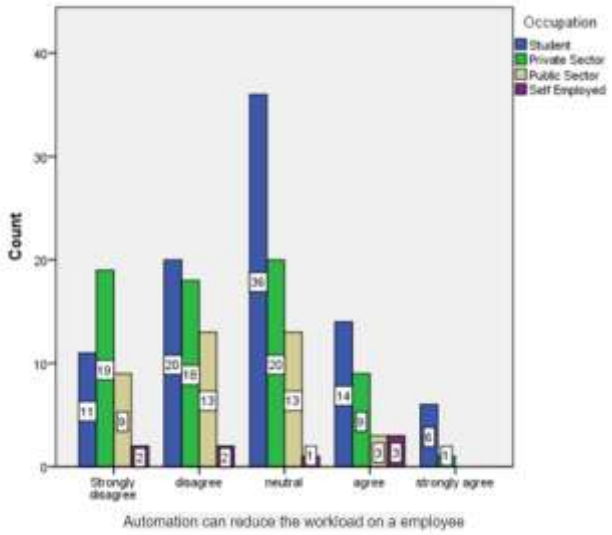
Legend: This figure dependent variable is compared with Age

Figure 7



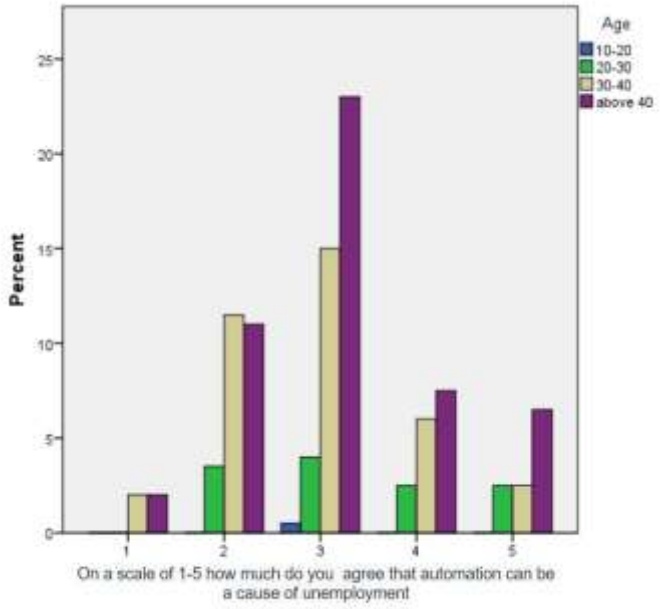
Legend: This figure dependent variable is compared with Educational qualification

Figure 8



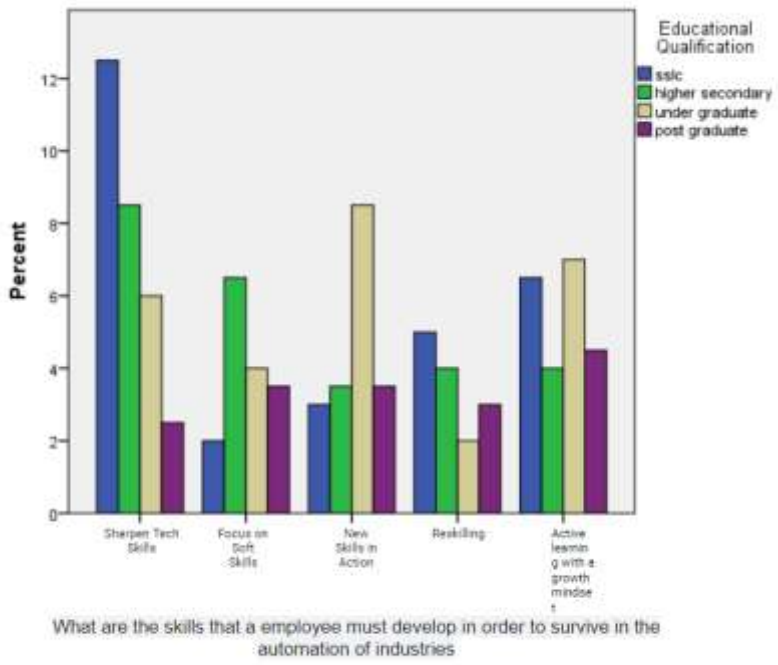
Legend: This figure dependent variable is compared with Occupation

Figure 9



Legend: This figure dependent variable is compared with Age

Figure 10



Legend: This figure dependent variable is compared with educational qualification

DISCUSSION

From Figure 1 there were people from the ages 0-20 , 21-40 , 41-60,60 above. there only few respondents in the age category of above 60, most of them agreed to the statement that automation can reduce the workload on a employee, From Figure 2 there were people in all the group of occupation from which 70% of them were students and others from form different employment from they stated neutral to the state that automation can reduce the workload on a employee From Figure 3 there were people from the ages 0-20 , 21-40 , 41-60,60 above. there only few respondents in the age category of above 60 and they agreed to the statement that automation can promote efficiency and ease ness in industries From Figure 4 there people form all the category of educational qualification most of them where UG with 60% followed by other category most of the people rated 3 followed by 2 that automation a can cause unemployment From Figure 5 there were people from the ages 0-20 , 21-40 , 41-60,60 above. there only few respondents in the age category of above 60 and it is analysed that most of the people rated 3 followed by 2 that automation a can cause unemployment From Figure 5 this figure is the dependent variable is compared with age and provides an solution for unemployment caused due

to automation most of the people stated that improving tech skill and adding or learning new skill will reduce the chances of unemployment due to automation

LIMITATION

The Major limitation of the study is the sample frame, since the sample was taken only within Chennai. The restrictive area of sample frame and sample size is another drawback of the research. So we could only come to an approximate conclusion of what the respondent is feeling to convey.

CONCLUSION

The purpose of automated systems is to perform functions more efficiently, more reliably, and more accurately than human operators. Also, expectations are that automated systems can perform functions and tasks at a lower cost than human operators.Thereby there are few arguments that can be put against human operators where work happens slow and also cost efficient from this research it is been analysed that automation is a must required factor in the evolving world but even though automation can perform all the task by it self it must be examined , tested and implemented by humans thus making it a extended job instead we can implement the automated robots where the atmosphere is not suitable for humans to work Eg mining oil rig wtc thus can promote efficiency and also benefits humans too . in this evolving world everyone must be able to adopt what is to come in future and must be ready to face anything . this empirical study on industrial automation illuminates a complex tapestry of outcomes for employees in the contemporary workforce. While the boon of enhanced efficiency and productivity is evident, the bane of potential job displacement and the need for upskilling looms large. Striking a balance between technological innovation and the well-being of the workforce becomes imperative. As industries continue to evolve, the findings of this research advocate for proactive measures, such as robust training programs and thoughtful policy frameworks, to mitigate the adverse effects on employees. By fostering a symbiotic relationship between automation and the workforce, we can navigate the future with resilience and ensure that progress aligns harmoniously with the needs and aspirations of the human workforce.

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