



Impact of Technological Advancements on the Skills and Employment Opportunities of Workers in the Corporate Sector

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ABSTRACT:

This paper discusses the influence of technology on the skills and employability of workers within the corporate sector. The world around us is dynamic and we need to adapt to these changes in order to survive. For the same to be effective it is significant to analyze the situation, understand past experiences and make our plans for future development. Therefore, this paper traces the various stages of the Industrial Revolution and the simultaneous changes in the labour market during that period. Then, the focus shifts to understanding Industrial Revolution 4.0 and how AI and automation have impacted the jobs and skill set requirements in various departments within a company. Furthermore, to make plans for future development, the various innovations in AI and its scope for potential developments within these departments is also discussed in welcoming an advanced workplace. The paper also highlights the need to understand and adapt to these new technologies so that workers can learn to coexist and survive with the exponential rate at which this development is taking place. Suggestions are given on how to overcome the negative impacts that an AI driven workplace has on the workers, within any company.

Keywords: Technology, AI, Industrial Revolution, Skills, Employment Opportunities

INTRODUCTION:

It is commonly observed that people are trepidated by change. It is the same in the case of technological advancements too. Many workers are of the opinion that an increase in the use of technology in the workplace would be the bane of their existence but that is not the case. This is a doctrinal research paper which attempts to explain the evolution of Industry 4.0, AI and Automation. It also goes into detail to understand what AI and Automation are, its various classifications and developments. This is done to better understand the course of future developments in this field. All the above observations are then applied in the corporate sector. The organizational structure within a company is considered and impact of AI on the employment opportunities, jobs, and skills in each of these departments is discussed within this paper. The paper also entails various recommendations and suggestions to incorporate these growing technologies within an organization, how to best tackle the risk of unemployment, and measures that could be taken to ensure that both technology and human intelligence can coexist to create a better work environment.

REVIEW OF LITERATURE:

This paper has been written after observing the world around us today. This work is a product of the fascination for the changing times and the new ventures that are a result of these changes. In furtherance of this admiration is the study of the works of a considerable number of authors and the same has been narrowed down to write this paper. Some of the notable works which have influenced this paper are discussed in this review of literature. First is Shafique, H. & Imran, M., Maqbool, N (2014)¹ - This is empirical research conducted to understand the extent of influence of technology on employee performance. It was conducted by collecting information through distribution of questionnaire to bank employees and conducting correlation and regression analysis on the obtained data. It was then concluded that there was a significant relationship between technological advancement and productivity, motivation, and training of the employees. It also recommended that skill set development was a major contributor towards a more effective and efficient workplace. Following this was Khatiwada, Kwon, Shrestha, & Yoon (2019)² which was a quantitative paper and focused on the impacts of Automation on jobs. It highlighted the skill demand and supply in the labour markets. The paper also discussed some of the requisites in an automated office environment such as the rising need for cognitive skills and the declining need for routine tasks that could be easily automated. It also rightly pointed out the requirement for strengthening of learnability in employees, the equal importance to both soft skills and hard skills, and the desperate need to incorporate such skills with education. Subsequently paper by Javeed, I. (2023)³ analyzed the impact of Industry 4.0 in India. The author believed that with automation came a fundamental change in the principles of business in India. The paper discovered this concept in depth by referencing to the contributions of various sectors to the Indian GDP in the year 2018 and the percentage of the labour force in each of these sectors. He also concluded that with the age of automation sectors such as health care, architecture, insurance, education, marketing and management, human resource would face grave challenges but ended his paper with a ray of hope that although many jobs as we know today might face challenges, it would soon help to transform and enhance the skills in these fields. Another very persuasive paper was Shaikh, J. (2021)⁴ which gave a new perspective to technological advancements and its impact on labour laws as it exists today. The arguments in the paper were lucid and very well put, and proposed the need for a new labour law that incorporated the interpretations of the terms “employer” and “employee” in the modern times. It was his view that the terms defined during the time of enactment of the labour laws are almost a century old and there is a need to alter them in order to accommodate the recent changes and developments. The paper also sheds light on the relationship between labour and capital in today’s world. It also imagined two scenarios in which way automation would have an impact on the labour market. Deriving from the observations and analysis done in the above papers, this research paper presents its ideas on the impact of technological advancements on skills and employment opportunities of workers in the corporate sector.

OBJECTIVE AND SCOPE OF STUDY:

This paper aims to understand the impact that Industry 4.0 has on the employment opportunities and skills required by employees to survive in this vigorously changing work environment. The focus of this research rests only on jobs within the corporate sector and does not extend to any other sector. The paper makes an effort to influence the minds of workers all around the globe to have a more optimistic approach towards technological advancement in the workplace. The paper clears the vision of AI as a robot run world towards a practical understanding of the subject. This study aims to explain the evolution of Industry 4.0, concepts of AI and Automation, Organizational Structure within a company, Job titles available within each of these departments and influence of AI on each department, Technologies dominating within each department and new job titles created within the department. It also gives the important skills that employees working in that department must learn in order to coexist with these technologies instead of being uncooperative to change.

¹ Imran, M., Maqbool, N., & Shafique, H. (2014). Impact of technological advancement on employee performance in the banking sector. *International Journal of Human Resource Studies*, 4(1), 57-70.

² Ra, S., Shrestha, U., Khatiwada, S., Yoon, S. W., & Kwon, K. (2019). The rise of technology and impact on skills. *International Journal of Training Research*, 17(sup1), 26-40.

³ Javeed, I. (2023). The Impact of Industry 4.0 on Employability and the Skills Required in India. *Global Economics Science*, 1-10.

⁴ Shaikh, J. (2021). Technological Influences on Labour Laws. *Issue 3 Int'l JL Mgmt. & Human.*, 4, 3964.

HISTORY OF INDUSTRIAL REVOLUTION:

Meaning of Industrial Revolution:

Industrial Revolution is understood to be the shift of labour force from agriculture to industrial jobs. This shift was a result of development in technology during the 18th century. In earlier days, the work force in anywhere in the world were dependent on agriculture to satisfy the society's needs and wants. But this proved to be difficult than it seemed because agriculture required extensive labour from people and the production and income from such activities were at times not sufficient to satisfy even the fundamental necessities of people. This changed with technological development and the start of the era of Industrial Revolution 1.0 in 1765 and further development in technology led to such subsequent Industrial Revolutions. The main ideology behind the Industrial Revolution was that it improved the pace of production and made the process more efficient. Further it also led to an economic transformation in the society so much so that in the present day we cannot imagine a reality before the occurrence of the Industrial Revolution, whose significance is apparent even in the briefest of moments.

Stages of Industrial Revolution:

First Stage:

The first stage of Industrial Revolution started in the year 1765 with the invention of coal and steam power. This jump started the process of mechanization. The advent of steam power by Thomas Newcomen in 1712 was a major event in England at that time, as this invention facilitated further coal extraction. The coal so extracted was then used to fuel steam engines. It is a result these vital inventions that made the transportation of humans and goods faster. If not for the Industrial Revolution the world of high technology around us today might be primitive.

Second Stage:

The second stage of Industrial Revolution happened in 1870, a century from the first Industrial Revolution. This happened after the development of electricity, gas, oil, and steel. These inventions were fully deployed after the concept of assembly line production was adapted by Henry Ford in his slaughterhouse in Chicago where different regions of the pig were slaughtered by different people in different workstations instead of one person slaughtering an entire pig all by his lonesome. This concept was later implemented in automobile production which made the process significantly faster and helped lower the costs of production. Other important inventions made during this period were telephones, light bulb, phonograph, and combustion engine.

Third Stage:

This stage is well known as the Digital Revolution and took place in the 1980s. Important technological developments in this period were partial automation using memory programmable controls and computer, internet, communication and other information technologies.

Fourth Stage:

This stage is contemporary and is recognized as Industry 4.0 by many researchers and professionals. It has its foundation from digital revolution, and ventures into Artificial Intelligence (A.I) and Automation technology. The applications of this technology although visible in everyday human life from a simple google voice search to the very recent release of ChatGPT, an artificially intelligent chatbot capable of natural language processing by Open AI on May 3, 2023. The intention behind the development of such technologies is to improve the quality of life, and to increase the income levels in the world.⁵

INDUSTRIAL REVOLUTION AND THE LABOUR MARKET:

In the period before Industrial Revolution people resorted to hand manufacturing and crafting. Most people were farmers and craftsmen who did handiwork to earn. There were no machines for production, but it was the human resource that played the major role. Investments in this method of employment were minimal and did not require much capital. It becomes inevitable to note that people

⁵ <https://www.accountancysa.org.za/the-stages-of-industrial-revolution-and-its-impact-on-jobs/>

during this period carried higher risk as they were self-dependent and if something were to go wrong the burden fell on the person himself and he had no backup to rely on, in case of any failure. This also resulted in many people being indigent and remaining enslaved in a vicious cycle of debt, poverty and misery. Therefore, during industrial revolution the shift from an agrarian society to an industrial dependant world caused many jobs to become obsolete and there was a need for more entrepreneurial pursuits from people who were craftsmen or agriculturists. Some of the many hurdles faced in this shift were requirement of investment funds, government support, an entrepreneurial spirit, access to raw materials, etc.⁶ A great advantage of this Industrial Revolution was that it did not require its employees to be skilled and only needed them to follow the process of production and operation of machinery. Any other trouble in relation to the units of production, efficiency in the production and price controls were not the job of the factory workers.

The succeeding Industrial Revolution which saw a shift from production of product as a whole towards the concept of assembly line production and mass production did not much impact the jobs of people as many of the people were assigned specific roles rather than being dismissed from work. Although there was loss of a few jobs, this innovation in the process of production paved the way for numerous unique and original job roles within the factory setting.

During digital revolution the introduction of computers and the internet laid the foundation for a more formal and organized workspace. Previously works were done in factories but after the 3rd Industrial Revolution many companies and corporations had shifted to applying the new rising technologies of that day to make effective use of the workplace environment Presentations previously done on papers and physical copies were now made using a computer, the workplace became more formalized and better organized after the advent of computer and the internet. It was necessary for people to be computer literate to get a job and any case otherwise hampered the smooth pace of work and became an obstacle in the way of effective and efficient functioning of the company.

Then, in the fourth stage of Industrial Revolution which is prevailing now, it is not sufficient for a worker to merely be computer literate but it has also become inevitable for a worker to specialize themselves in various technical skills such as Data Science, Machine Learning, Deep Learning, Coding, Programming, Data Analysis, Web Development, Cloud Computing, Artificial Intelligence, Blockchain, Robotic Process Automation (RPA), Cybersecurity, Virtual Reality and Augmented Reality (VR and AR)⁷ and so on.⁸ This is a golden age as there is a shift from ANI to AGI. The future awaits the shift from AGI to ASI. It is with the current shift from ANI to AGI, and in anticipation of the shift from AGI to ASI that this paper has found its basis to analyze the labour markets and the skills and employment opportunities that a worker within the corporate sector needs, in order to make the shift more steadily instead of leaving behind a large trail of unemployment in the world economy.

INDUSTRY 4.0: A NEW REALITY

It is the dawn of a new world, where there exists not only a corporeal reality that we have known for centuries but the convergence of corporeal and virtual worlds to create a new reality altogether. The foundation of this reality is set in the end of the 20th century and the beginning of the 21st century. The discovery of computers and internet set this change in motion, as internet created a path to connect people from different parts of the world and computer improved working standards, combined they became the ticking clock waiting to make this world a much advanced, and technology dependent planet.

To better understand these developments and their outcomes on our future, it is inevitable to understand what is essentially meant by AI and Automation, its classifications and our progress till date.

AI or Artificial Intelligence is defined as the imitation of actions of intelligent beings through inventions of machines, which further down the lane is meant to achieve a shift from a mere imitation to a category of intelligent being of its own species. Automation underlies in the foundation of AI where technologies require very minimal human assistance and intervention to function. It is a higher form of AI. A very small but significant example of such automation is automobiles.

⁶ <https://medium.com/spark-by-sime/industrial-revolution-1-0-9e6dc9c62c8c>

⁷ <https://www.shiksha.com/online-courses/articles/trending-tech-skills-to-master/>

⁸ <https://www.forbes.com/sites/bernardmarr/2022/12/05/the-top-5-in-demand-tech-skills-for-jobs-in-2023/?sh=542e08f3826c>

Types of AI:

AI can be categorized into three types based on their ability to perform advanced functions:

1. **Artificial Narrow Intelligence or Weak AI -**

This is the most fundamental type of AI there is. This type of AI is task specific and does not simulate human intelligence in entirety. This is where AI is taught to accomplish only specific tasks after giving the necessary information. It is referred to as weak AI as it cannot extend its functioning beyond the instructions fed to the system. Its inability to think and act beyond a given set of information and instructions is what makes it weak. Some examples of weak AI or ANI are voice and face recognition systems, search engines, virtual assistants like Google and Siri etc.

2. **Artificial General Intelligence-**

This is the second type of AI which is slightly more advanced than ANI. Here, AI not only performs specific tasks, but it has the ability to apply acquired knowledge to solve problems without requiring human assistance. A concept called experiential knowledge is applied by the AI here, where knowledge learned from a previous experience is applied to solve an existing problem or a set of problems. A more relatable example of this is self-driving cars. The world has only now started to venture into AGI. A Humanoid built recently in China possesses the capability to imitate human behaviour through experiential knowledge and data already at its disposal.

3. **Artificial Super intelligence -**

This type of AI has been the dream of many scientists and science fiction aficionados. It is also the initial understanding of the concept of AI by any human due to its portrayal on media. But it is not the case. Super AIs are systems that not only have human intelligence but also have the ability to transmit such intelligence to other alike systems and function from their own consciousness. It is then that AI truly attains the state of a being. Although there is an exponential growth in technology, the world is not yet capable or ready for ASI and it is safe to say that it is a far future.

Stages of progression of AI:1. **Reactive machine:**

A narrow AI that can perform only task specific functions and does not have the ability to function from memory, because of the lack thereof. This is a disability as the AI cannot strategize.

2. **Limited memory:**

A Strong AI which has memory and can apply information and previous experience to perform a given task at hand.

3. **Theory of mind:**

AI that can interpret and understand human emotions, intention, and behaviour. This kind of AI will be more human-like.

4. **Self-awareness:**

This type of AI is self-conscious and can understand its own state. This is not in existence at present.⁹

Types of Automation:1. **Fixed Automation:**

It is when a Narrow AI technology can only perform a given set of operations and only in the given sequence.

2. **Programmable Automation:**

The ability of a Narrow AI to perform a given set of operations, but programmed such that it can alter its sequence when necessary is called programmable automation.

⁹ <https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence>

3. Flexible Automation:

When a Narrow AI can not only alter the sequence of its operations but can go a step ahead to produce a variety of sequences, it is called flexible automation.

ORGANIZATIONAL STRUCTURE OF COMPANIES:

In any company, it is the organizational structure that enlightens us on the various departments, functions, and job titles within the company. Since this paper aims to understand the impact of AI within the corporate sector, it is inevitable to understand the influence of AI on every department within any company so that one might completely understand the future of the labour markets with increasing development in AI.

In general, any company has the following departments:

- Human Resources or HR
- Operations Management
- Information Technology or IT
- Marketing
- Sales
- Accounting and Finance

IMPACT OF AI ON THE ABOVE LISTED DEPARTMENTS:

Artificial Intelligence on HR:

The main purpose of an HR department within any company is to handle the employees' life cycle within the company. This includes recruitment, maintenance of employee records, employee benefits, training the employee, assessing employee performance and so on.

The job titles available within this department are as follows: HR Generalist, Recruiter, Analyst, HR Manager, HR Assistant and Interns, HR Director, Headhunter, HR Specialist, Resources Manager, Vice President, Chief Human Resources Officer and so on.

With the growing trends in artificial intelligence, the process of recruitment and hiring can be done by AI and reducing manual tasks for HR employees through its ability to conduct job posting and sending out job offers. AI can further help with onboarding through induction training, verification of employee ID's and handling of administrative tasks like giving ID and access to hardware and software of the company. Artificial Intelligence also helps in surveillance and monitoring of employees and helps significantly in identifying talents.

Although the performance of these advanced functions by AI can cause unemployment of interns, temps and other juniors within the department, other employees within the department can be accommodated to work alongside these technologies. Contrary to the dystopian mindset that AI leads to unemployment, many fail to note that developing technology is more in the fields of Narrow AI or General AI and cannot replace human intelligence. Also, it is vital to note that with growing technology comes new job titles.

Some prospective job titles with the growth in AI are Chatbot and Human Facilitators, Algorithm Bias Auditor, Work from Home Facilitator, Virtual Reality Immersion Counselor; etc.¹⁰

Skills needed for employees within this department are Knowledge of social media platforms, Human Resource Information Software (HRIS), Applicant Tracking Systems (ATS), Cloud Technology, Usage of Gamification Techniques, learning to use Talent Management Software (TMS).

AI on Operations Management:

Operations management is the driving force of any company. It is vested with goal setting, planning and opportunities creation for the company. It is responsible for holding meetings with the top management and other working staff to discuss new plans and policies. It also collaborates with the HR

¹⁰ <https://blog.ongig.com/job-titles/human-resources-job-titles/>

department for recruitment purposes. One of the main functions of this department is the setting of long-term and short-term goals for the company.

Various job titles in this department are Operations Manager, Chief Operating Officer, Operations Coordinator, Operations Analyst, Operations Specialist, Assistant, Vice President of Operations, Operations Engineer etc.

Decision Support System an AI based invention that helps in effective decision making is a major development in operations. AI in supply chain analytics gives a company competitive edge over the other rivals in the market. AI facilitates better GPS systems for tracking transportation and transit facilities. AI also provides for an improved surveillance which helps detect issues in machinery and forecasts machinery in maintenance. When Supplier Relationship Management (SRM), Customer Relationship Management (CRM), and Enterprise Resource Planning (ERP) systems are integrated with available data and business intelligence it would result in a considerably more efficient evaluation of employee performance.

Trending job opportunities in this department would be Data scientists, Data Analysts, Senior Machine Learning Operations Engineer, Senior Director Cloud Operations, and Innovations AI Platform etc. Essential skill need by employees in this department is ATS.

AI on IT Department:

An IT department within a company facilitates the maintenance of computer infrastructure, oversees information and its storage, updates existing software or implements new software, provides hardware support, maintains business websites and so on.

AI and IT is an interesting combination. Unlike other departments, the very root of the IT department is from artificial intelligence. Due to this fact an IT department is required not only to have the prospects that the future holds but also to maintain a balance between traditional infrastructures and modern initiatives. It is this balance that makes the workings of the IT department much more interesting in an organization that incorporates enhanced technologies.

The main subsets of AI that is extensively used in IT are machine learning (ML) and deep learning (DL). Both Machine Learning and Deep Learning are essential skills under artificial intelligence. Another important technology is Robotic Process Automation (RPA) which uses artificial intelligence to automate routine digital tasks.

Job positions currently in the IT department are: Technical Advisor, Senior Analyst, Senior Programmer, Chief Information Officer, UX Designer, Database Administrator, Cloud Engineer, IT Security Specialist etc.

Prospering job titles: Intelligence Designer, Data Curator, Machine Learning Data Scientist, Robotics Process Analyst, AI Interaction Designer etc.

Skills that employees must procure in this department are Machine Learning, Deep Learning, UX/UV Designing, Cybersecurity, Robotic Process Automation.

AI on Marketing:

The marketing department in a company focuses on promoting and publicizing the company and its products. The day-to-day functions of this department is developing and reviewing marketing campaigns, Social Media Marketing and SEO tactics, managing the company brand and its image, advertising etc.

AI helps businesses to tailor their marketing strategies through machine learning algorithms, personalizing customer experience by analyzing and predicting future behaviors (an apt example of which is Spotify giving personalized playlist and recommendations to its users), Natural Language Processing and Chatbot etc.

Job titles under this department are Marketing Coordinator, Marketing Analyst, Brand Manager, Director of Marketing, Senior Vice President of Marketing, Chief Marketing Officer etc.

Some new job opportunities in Marketing with the development of technology are Digital Media Specialist, Graphic Designer, Communications Coordinator, Copywriter, Promotions Manager, Social Media Manager, Social Media Director, etc.

Skills needed by employees in this department are Digital Media Marketing, knowledge of effective use of Chatbots, Machine Learning, Natural Language Processing, Search Engine Optimization etc.

Artificial Intelligence on Sales:

AI and Sales can go hand in hand without having to question whether it will affect the labour force. This is because although automation of sales can be done but it might not be profitable for the business as the importance of sales representatives cannot be replaced by AI. Sales Representatives are sociable, creative, and can behave accordingly with the customers in such a way as to influence their buying decisions. It is a belief that narrow or general AI does not have the intelligence required to be as persuasive as a human sales representative can be with the customers. Humans have a certain degree of connection amongst themselves which cannot essentially be felt with the AI of this decade. Therefore, jobs in sales are not significantly affected by the advancement of AI.

AI on Accounting & Finance:

An accounting department within a company performs many functions beyond mere bookkeeping such as identifying financial risks, payroll management, creating budgets and funding plans etc.

With the immersion of AI and Automation in this department many of these routine tasks can be completed as ANI and AGI have sufficient capability to accomplish most of the tasks performed within this department. This makes working within the department a much easier task. Instead of taking a more pessimistic approach it would help to understand that since the development of Super AI is a far future, any developed technology requires people to operate the same. Therefore, people in this department need to be trained and reskilled to adapt these technologies in the workplace and not work against it.

Skills needed: Knowledge of how to use business intelligence softwares such as SQL, SAP Business Object, SAS Business Intelligence, Zoho Analytics, Big Data, usage of QuickBooks etc.

FINDINGS/ RECOMMENDATIONS/ SUGGESTIONS:

- A pessimistic approach to technological advancements is not the way to edge forward. Change is inevitable and one must learn to understand the implications brought about by the change, adapt, and learn to coexist with it rather than becoming disappointed and disillusioned.
- Every Industrial Revolution in the past has resulted in unemployment and loss of jobs, but it has simultaneously created new job opportunities in the labour market.
- The only way to ensure that a worker does not lose his/her job by virtue of technological advancements is to continuously and rigorously invest in knowledge and learning new skills and developing oneself to excel in this changing world.
- In order to have control over excessive unemployment government can impose such rules and regulations as it deems fit and old legislation can be revised or new legislation may also be brought into effect for the better understanding and implementation of labour laws.

CONCLUSION:

Therefore, from the above study it is evident that every Industrial Revolution has been accompanied by unemployment. But this does not necessarily mean that people lose all sources of livelihood. On the contrary, new jobs are created for every job lost and once people understand that it is a clear way forward. Another takeaway from this paper is the understanding of the various concepts in AI and its types rather than living in a false sense of imagination that an AI driven workplace would be an office run by robots and that robots would replace all the humans working in the office. Therefore, technological development when incorporated in the workplace with the right cooperation from employees may prove to be the prosperous future that the world has waited for centuries.

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