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Research Article

Impacts of Industry 4.0 on Employment and Opportunities for Sustainability

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ABSTRACT

Digital transformation is a way of using technology to create new procs or modify ones to meet changing business requirements. Reimagining the business process in the digital world is called digital transformation. Technology is changing very rapidly and driving changes all over society. We, humans, not only increasingly use it but also rely on it in our personal lives, we even find our workplaces evolving digitally with most of the processes undertaken by technology. These are all the effects of the fourth industrial revolution or Industry 4.0. Due to Industry 4.0, we all are living a life we are unaware of because we do not understand its works. But there will come a time when its importance will be of utmost and we should not be the ones left out or fear losing what we are pursuing or doing right now in terms of employment. Industry 4.0 has a lot of spectrums in itself but the most important part that is changing all this is the word "Automation". Increased automation will make our time freed up and we will have to focus on more complex tasks. There will be a need for a workforce that is capable of building, problem-solving, programming, and developing technologies. This is just about the people in technology. But as it will affect multiple careers, this paper will give an overall idea of how we as humans in any aspect of the profession should face the upcoming changes and sustain our profession. This paper aims to examine the impact of Industry 4.0 on employment opportunities. To better comprehend how such a digital revolution is influencing modern life and the workplace, the purpose of this article is to analyze the consequences of recent trends and features associated with digital transformation in the sectors of Education and Future Jobs. There will be an elimination of certain employment, a development of others, and a regular emergence of new jobs that do not already exist. In this paper, we'll go over certain things you should take into consideration as you deal with Industry 4.0 and begin to build your profession.

Keywords: Industry 4.0, 4th Industrial Revolution, Employment, Education, Future, Jobs.

I. Introduction

Industry 4.0 is a terminology used by the German government at the Hannover Fair in 2011 to describe a project dedicated to supporting the German industry in meeting future problems. It is the fourth industrial revolution, in which disruptive digital technologies such as the Internet of Things (IoT), robots, virtual reality (VR), and artificial intelligence (AI) are impacting industrial output.

The First Industrial Revolution was based on the mechanization of manufacturing through the utilization of water and steam energy. Because of electricity, mass manufacturing was developed during the Second Revolution. Since the 1950s, the Third Digital Revolution has used electronics and information technology to automate manufacturing. Based on the Third Industrial Revolution, the current Fourth Industrial Revolution is characterized by a technological convergence that blurs the lines between the physical, digital, and biological worlds. According to PwC, the Fourth Industrial Revolution can happen in three phases: The algorithm wave, which is currently developing, will last until the beginning of 2020. In industries including banking, information, and communication, it focuses on automating straightforward computing tasks and

analyzing structured data. The wave of augmentation is already underway, but it won't cover the entire market until the late 2020s. It focuses on automating routine tasks like filling out forms, communicating, and exchanging information, as well as statistical analysis of unstructured data in partially controlled environments like drones and robots. The autonomous wave will start in the 2030s and will show itself in the automation of employee and physical tasks. In addition, it is anticipated that machines and robots may eventually take the position of people in dynamic, real-world situations that require a response and problem-solving, such as manufacturing and transportation (autonomous vehicles). Many occupations have changed and new ones have been established as a result of Industry 4.0. The purpose of this study is to identify possible prospects for both individuals and employers in the Industry 4.0 era. As a research tool, a review of the relevant topic literature was done.

With The Economist predicting that 50% of jobs will be automated, the Fourth Industrial Revolution will have an impact on almost every industry. However, some industries are more likely to be automated than others since robots, like human workers, have specialized skill sets. In the near future, we should anticipate a decline in the number of full-time workers in industrial and agricultural occupations, as many of these positions are already being phased out due to increased automation. Robots have been used in manufacturing since the 1970s, and they can carry out tasks in industrial settings more effectively and safely.

II. II. Literature Review

1. Investigators- Industry 4.0, Digitization, and Opportunities for Sustain-ability - Morteza Ghobakhloo
Type of Research- Conceptual
Focus of the study- Discusses the general concept and approaches of Industry 4.0 Principles, technologies, and architectural design of Industry 4.0 were described. Interrelationships among Industry 4.0 sustainability functions were modeled.
Contribution- Critical sustainability functions of Industry 4.0 were identified and described. The dependence-driver power Industry 4.0 sustainability functions were analyzed.

2. Investigators- An effect analysis of Industry 4.0 to higher education
Type of Research- Conceptual / Empirical
The focus of the study- Impacts on higher education of industry 4.0 are examined in this paper
Contribution- With the statistical data offered in this study, the relevance of Industry 4.0 in education has been demonstrated.

3. Investigators- Labor Market Risks of Industry 4.0, Digitization, Robots, and AI - Zoltán Rajnai, István Kocsi
Type of Research- Conceptual / Empirical
Focus of the study- To explore the issues of Industry 4.0 in the service sector
Contribution- It answers questions like Is it possible to compensate for the loss of old labor market requirements by creating new sectors of work and new types of jobs?

Most likely, Industry 4.0 will develop gradually, drawing on already-developed technology. The rise in research and publications reflects the topic of Industry 4.0's speedy evolution among academics and business people. Industry 4.0, however, has some undiscovered facets that could be the subject of further research.

The next sections go over some research options that have been found:
Most research focuses on technology management and offers an introduction to Industry 4.0 theories and concepts. The concepts and tenets of Industry 4.0 must first be evaluated, though, before they can be put into practice.

Several studies on the impact of Industry 4.0 have been published to date, but no strategic study of the influence of Industry 4.0 on work has been published to our knowledge. As a consequence, this study develops an interactive way to identify and analyze the impact of the industry 4.0 idea on employment, as well as a critical reflection on the employment landscape, based on prior research.

In previous research, the emphasis was entirely on the consequences of I4 on jobs, rather than the preventative measures that should be taken.

III. III. RESEARCH METHODOLOGY

The power of digital transformation is best demonstrated by the growth of artificial intelligence in service organizations. We observe AI-powered chatbots responding to straightforward customer questions and requests, acting as a friendly presence on websites, and shortening the time customers must wait to speak with an agent to complete their tasks. We all remember the time when we used to stand in long queues at banks to get our work done and how troublesome it was to skip our daily routine to get important transactions. Technology evolves at a very rapid phase. Robots deliver food to specific tables directly from the kitchen and then customers have to help themselves to the food, or hotel staff will assist them. Customers at

the popular restaurant were surprised to see the robot waitress in a sari, serving food and beverages. We never had imagined such transformations earlier but it is true. The restaurant is named Momo and it is in Chennai, yes in India! To prevent accidents on the road, municipal corporations will install automated high-speed cameras at black spots to check vehicles' speed and intimate the police control room for speedy action against the violators. Yes, this is happening in India and all over the world. Just the new normal! This should not be surprising to us as till now you must have got an idea of what is happening and how everything is changing due to Industry 4.0.

According to an international survey, if students in the eighth grades onwards do not pursue a plan for a meaningful career path, 60 percent of the employment they will pursue in school-college will be lost shortly. This was not the scenario some years ago. If we see the previous Industrial revolutions, Industry 4.0 is way different from that. Technology has changed so drastically, that it always keeps us astonished. We think it was just some years ago that it was easy to earn a degree in most disciplines in 3-4 years and then work for the following 30 years. It is now undergoing a fast transformation. In reality, you will be paid based on 'skills and production' rather than 'time and information in your future job. To keep it apt, "What got you here, won't get you there," Marshall Goldsmith famously said. It is critical for high school and college students, as well as their parents, to see that the assumptions made thus far are no longer valid. Recently, we all know that may be due to this impact of the revolution or just that someone has put light on the seriousness of “change”, after years our education system has planned to bring up something new called the New Education Policy. Maybe, that may to some point help students to focus on the current scenario but depending just on school or university for a profession is suicidal, which means school-college-university is vital but insufficient in logical form. According to the present survey, the majority of businesses, including 57% of IT firms, believe that their workforce needs retraining or reskilling. There are 3 different types of employment: Primary Sector, Secondary Sector, and Tertiary or Services Sector. If we take a wide look and observe the working of all these occupations, we will get to know how it is affecting and will affect everything in the long run. If we look at the current scenario, the tertiary or service sector which includes trade, transport, and storage, and the service class will be the most affected ones. People doing manual work will be at risk of automation being replaced with that. AI is having an upper edge over everything. Many tasks will be replaced by the use of automation. It will have a great impact on the work they do.

Now that we know that we are in trouble, not actually! We still have time to think and act accordingly. Students who are studying in Grade 7 onwards should try to explore their current careers and the profession they would like to work for. Employees who are currently dependent on one type of employment should try to upskill themselves. Here are some points we all should focus on and start working on them so that we are up to pace in the current transformational world. Human Resources or Human Relations which can be termed 'HR' in simple terms, its effects and future directions in Industry 4.0 are what we will look at now as an example. Big Data, AI, Bots, and Analytics, are these four aspects that will have a great effect on HR. Human Resources primarily includes Recruiting, Hiring, secondly manpower and performance appraisal and thirdly solving the daily issue of employees, managing finances, and arranging functions in the company. First of all, recruiting and hiring will be affected by AI by 55% and the work will be automated. This is just an example of HR. Many fields will have just an impact like this. Now let us have a look at what can be done. In Industry 4.0 majorly three important things are to be understood.

We can call them 3 golden points. 1) Jobs will come to an end/ we will be unemployed is not what is going to happen in the future. We are not losing jobs. 2) Instead of Jobs or Work that is dependent on something or we can say which is transactional, jobs that are creative or changing(transformational) are the ones we should try to get involved in and progress in. 3) Continuous Learning, there is no option for this. It's high time to keep away all the boredom and start working, in different ways. From now onwards, Microlearning or short-term learnings/courses will gain a lot of importance and demand. So, getting into the depth of only one field and staying there for years, will be dangerous. Undergraduate and Postgraduate students with their ongoing degrees should keep exploring and learning courses in interlinked domains. MOOC courses on Basic Data Analytics (which are free of cost), courses on excel macros, and python programming basics which anyone can do can be done on websites like Coursera, Code Academy, or EDX. Engineering/Science students can try out courses on 'Data Science', and 'R programming' which are free of cost, and also work on software that is free of cost. Those looking for a creative side of learning, mostly mechanical and instrumentation engineering students or those in the designing field can have a look at Robotics/Mechatronics courses. People having extraordinary art skills or those fond of drawing can explore the field of UI/UX. At times we are working in different fields and at the same time also have an interest in others. Psychology is the study of the human mind and understanding of human nature. Those who have

An interest in this can should have a look at what cognitive computing is and how it works. Those fond of learning different languages, who have an open mind and are creative at writing, without being dependent only on university courses should also try linguistics and creative writing on Coursera/edX.

IV. Conclusion

Because of the expanded opportunities provided by artificial intelligence, Industry 4.0 is increasing automation and moving it from basic and regular occupations into more cerebral ones. The following are some of the massive consequences of Industry 4.0 on employees, both predicted and actual: (1) Employees must have a fundamental grasp of exponential technologies, as well as an open mind and the ability to adapt to change. (2) Data retrieval and processing will be quicker, emphasizing the importance of analytical skills. (3) Existing employment can benefit from some intelligent/smart technologies that can assist them to create better outputs and/or quality. (4) I4.0 technology will eliminate/replace repetitive and straightforward tasks. (5) Employees will be mostly responsible for observing and overseeing the production process. Industry 4.0 technologies enable non-routine cognitive tasks, i.e. more sophisticated employment, while not impacting activities that rely heavily on social skills. As a result, future employment is projected to be primarily focused on extremely complicated activities that need social and transversal competencies and certifications. Competencies and abilities, on the other hand, must be updated regularly. In order to successfully and efficiently adapt to Industry 4.0, industrial enterprises require people with varied skills and capabilities; appropriate technical infrastructure; and openness to change. Technology advances and a company that does not adapt will be unable to compete in the market.

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