# IMPACT OF AUTOMATION ON EMPLOYMENT (Challenges & Opportunities)

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**ABSTRACT**

***The world is going through a massive makeover as far as technology is concerned. Automation through robotics technology is growing at a rapid pace, many type routine jobs are now becoming automated. These include making tacit judgments, manufacturing through robotics, or even driving activities that used to be considered too difficult has also transferred into to automation successfully. This has given birth to severe concern of growing unemployment in the different countries which has resulted in growing unemployment. For an instance the horses being used as one of the movers of wheels were gradually replaced by the automobile. The Paper is based on secondary data and has attempted to understand the pace of automation in the current techno savvy environment and its impact on employment. It will also present the contemporary trends in Automation in different sector which has impacted the employment at global level.***

**KEYWORDS:** *Automation, Artificial Intelligence, Impact of Technology, Robotics, Unemployment due to Automation.*

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## INTRODUCTION

Today Automation has become a great tool almost in all industries due to the various advantages it offers. Automation technology like robotics, radio frequency, and high speed network computing etc., has resulted in drop of employment at a larger scale. Another major factor which leverages the growing rate of automation is "Globalization", cut throat competition at global level in terms of cost, manufacturing quantum, product preciseness and quality is compelling the entrepreneurs to adopt new automated technology to successfully survive in the competitive era. Today not only manufacturing jobs are being reduced or replaced by automation, but also high skilled jobs are at risk. One of the pivotal reason is; since 1965 the computer processing power is double in every two years. Even the computing power which controls the space "Apollo Mission" can be fit into a small chip of smart mobile phone. In a few decades computer will be thousand times more powerful than they are today. Already computer based artificial intelligence is easily been the worlds best chess master, it can also recognize faces, understand languages and even compose music. They can do many things that human can't do with ease and efficiency, this threatens many of the jobs which earlier were thought to be secure. For an instance taxi driving which is one of the top job in US, have already replaced by driver less cars, very soon millions of truck drivers, taxi drivers would be job less. Even in restaurants many cooks may be replaced in coming decades by machine cooks which can cook recipes perfectly without talking any breaks. According to a study conducted in 2013 at oxford university within 20 years 40% of all jobs are at risk, as these jobs are going to be replaced by technology causing unemployment of 80 million people around the globe by 2030 and this is really an alarming situation that the world would face.

### Objective of the Study:

1. To present contemporary global trends of automation technology.
2. To understand how Automation is replacing humans in different fields of work.
3. To present benefits of Automation.

### Research Methodology

The research is based completely upon the secondary sources of data, which is exploratory related to the subject of the research. Sources of this research include e-journals, web portals and text books.

**Literature Review:**

According to Groover, Mikell (2014), Automation can be defined as the technology by which a process or procedure is performed without human assistance. Automation can been achieved by various means including mechanical, hydraulic, pneumatic, electrical, electronic devices and computers, usually in combination.

Automation is a technology to do things so that human to do them themself, minimizing the level of human intervention. We are living in a new automation age in which robots and computers can not only perform a range of routine physical work activities better and more cheaply than humans, but are also increasingly capable of accomplishing activities that include cognitive capabilities.(The age of analytics: Competing in a data-driven world, McKinsey Global Institute, December 2016.)

Robotic automation lets organization automate current task as if a real person was doing them across application and systems. It interacts with the individual systems in the same way as human user. Functional trained robos are virtual workers and are capable of executing rule based information, processes, improving accuracy and efficiency.

The star of Westinghouse's exhibit at the 1939 World's Fair was Electro, a robot that could walk, talk, and count on its fingers. Sadly, Electro and his kind were little more than demonstrations of remote control by human operators. By the early sixties, they had been replaced in the public imagination by something much more useful i.e. the computer.

The first assembly-line was documented in 1804, it was not until the late nineteenth century that continuous-flow processes started to be adopted on a larger scale, which enabled corporations such as the Ford Motor Company to manufacture the T-Ford at a sufficiently low price for it to become the people's vehicle (Mokyr, 1990, p. 137). Crucially, the new assembly line introduced by Ford in 1913 was specifically designed for machinery to be operated by unskilled workers (Hounshell, 1985, p. 239). Furthermore, what had previously been a one-man job was turned into a 29-man worker operation, reducing the overall work time by 34 percent (Bright, 1958)

Today the journey of Ford from 1804 till 2017 has brought new paradigm shift in the technology. That could be a big help to assembly workers and offer more design freedom. Ford Motor Company is testing of a new type of assembly line robot that were co-developed with German robotics company KUKA Roboter GmbH with the intention of assisting human line workers. Two of these three-foot-tall machines are in use at the Cologne, Germany factory, where they assist human workers to install shock absorbers on Ford Fiestas. These workers would have originally had to juggle the shocks and tools to install them, but now the robot helps them position and install the parts. The robots feature technology that senses where the person is and will stay close by for assistance. This also allows them to make sure they don't maneuver in such a way that could injure the person reducing safety risks. In addition to heavy lifting, Ford notes the robots can even be programmed to make coffee as well as other delicate tasks. Ford also explains that these robots can lead to safer, faster and higher quality vehicle assembly, as well as making the process easier for employees. Ford of Europe's Director of vehicle operations, said Karl Anton, said that this technology could "open up unlimited worlds of production and design for new Ford models.

The term automation, inspired by the earlier word automatic (coming from automaton), was not widely used before 1947, when Ford established an automation department. Automation or automatic control, is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat treating ovens, switching on telephone networks, steering and stabilization of ships, aircraft and other applications and vehicles with minimal or reduced human intervention, with some processes have been completely automated. Rifkin, Jeremy (1995).

According to Brynjolfsson and McAfee (2011), the pace of technological innovation is still increasing, with more sophisticated software technologies disrupting labour markets by making workers redundant. What is striking about the examples in their book is that computerisation is no longer confined to routine manufacturing tasks. The autonomous driverless cars, developed by Google, provide one example of how manual tasks in transport and logistics
may soon be automated.

**How Automation is replacing humans in different fields of work.**

In one of the article of Economics Times Jan 20th 2018, titled "The real reason why new engineering graduates aren't getting that job call " views that Automation and slowing growth have hit hiring in India's information technology (IT) companies. For the first six

months of this fiscal, the top six Indian IT companies saw its workforce decline by 13,402 compared to an addition of 60,240 in the same period a year earlier.

According to the study of 46 countries and 800 occupations by the McKinsey Global Institute found that up to one-fifth of the global work force will be affected. Up to 800 million global workers will lose their jobs by 2030 and be replaced by robotic automation. It said one-third of the workforce in richer nations like Germany and the US may need to retrain for other jobs. Machine operators and food workers will be hit hardest, the report says. Poorer countries that have less money to invest in automation will not be affected as much, according to McKinsey.

Indian vendors under clients' pressure to embrace Artificial Intelligence, cut costs Automation is expected to gain further steam in 2018, rendering nearly 70 per cent of the Indian workforce irrelevant in IT sector (*The Hindu, 14th 2017, Automation to kill 70% of IT jobs )*

Automation impact: By 2021, one in four job cuts may be from India IT, IT-enabled services and security services, followed by banking, will be the first sectors to feel the heat,. India will make up around 23% of jobs to be lost to automation globally by 2021. *( HR solutions firm PeopleStrong )*

The era of high job security is gone. In response to increased pressures to reduce costs, solutions like restructuring, down-sizing and **automation will continue to eliminate some jobs** and drastically alter others.*( U.S. Department of Commerce Office of Human Resources Management)*

As automation makes basic and repetitive jobs redundant, IT companies are getting more discreet in hiring. Instead of bulk hiring from campuses, they are mostly hiring those with niche, new-age skills and those who can be reskilled.

Tata Consultancy Services too cut down hiring. The company added just 3,657 employees in the first nine months of this fiscal on a net basis, an 85% drop from the same period a year earlier, when it added 24,654 employees.

According to the HfS AI, automation will result in reduction of overall number of IT services sector employees between 7-10% by 2022 in India and the US, research. India currently has 3.9 million employees. By 2022, with higher use of automation and AI, India would see 15% growth in medium-skilled workers in IT-BPM sector,it will have more than one million people at that level, while high-skilled roles will see close to 50% growth by that time.

According to Business Today & Mc Kinsey research identified and published job risk index as ;

**Jobs at High Risk :**

- Predictable physical work and repetitive jobs
- Data Processing
- Data collection

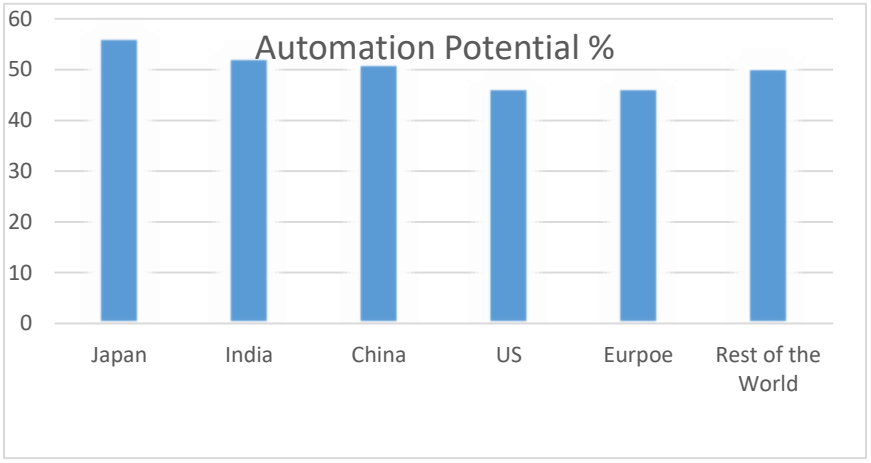
These type of jobs include welding , pick and place, packing, materials supply painting, IT infrastructure and Maintenance parts of application development

**Less Risky**

- Unpredictable physical work and non repetitive jobs
- Stakeholder/Customer interactions

**Least Risky**

- Managing others
- Applying expertise




**Country Wise Potential of Automation**

**SOURCE: Oxford Economic Forecasts; Emsi database; US Bureau of Labor Statistics; McKinsey Global Institute analysis**

**Benefits Automation**

The use of automation technologies can open doors of performance benefits for organizations. Such benefits are varied, and depends on the individual use case, and it may be potentially very substantial in some cases, or may be considerably larger than cost reductions associated with labor. They include, but are not limited to, greater ouput, higher quality, improved safety, reduced variability, a reduction of waste, and higher customer satisfaction.

Automation has been achieved by various means including mechanical, hydraulic, pneumatic, electrical, electronic devices and computers, usually in combination. Complicated systems, such as modern factories, airplanes and ships typically use all these combined techniques. The benefit of automation include labor savings, savings in electricity costs, savings in material costs, and improvements to quality, accuracy and precision

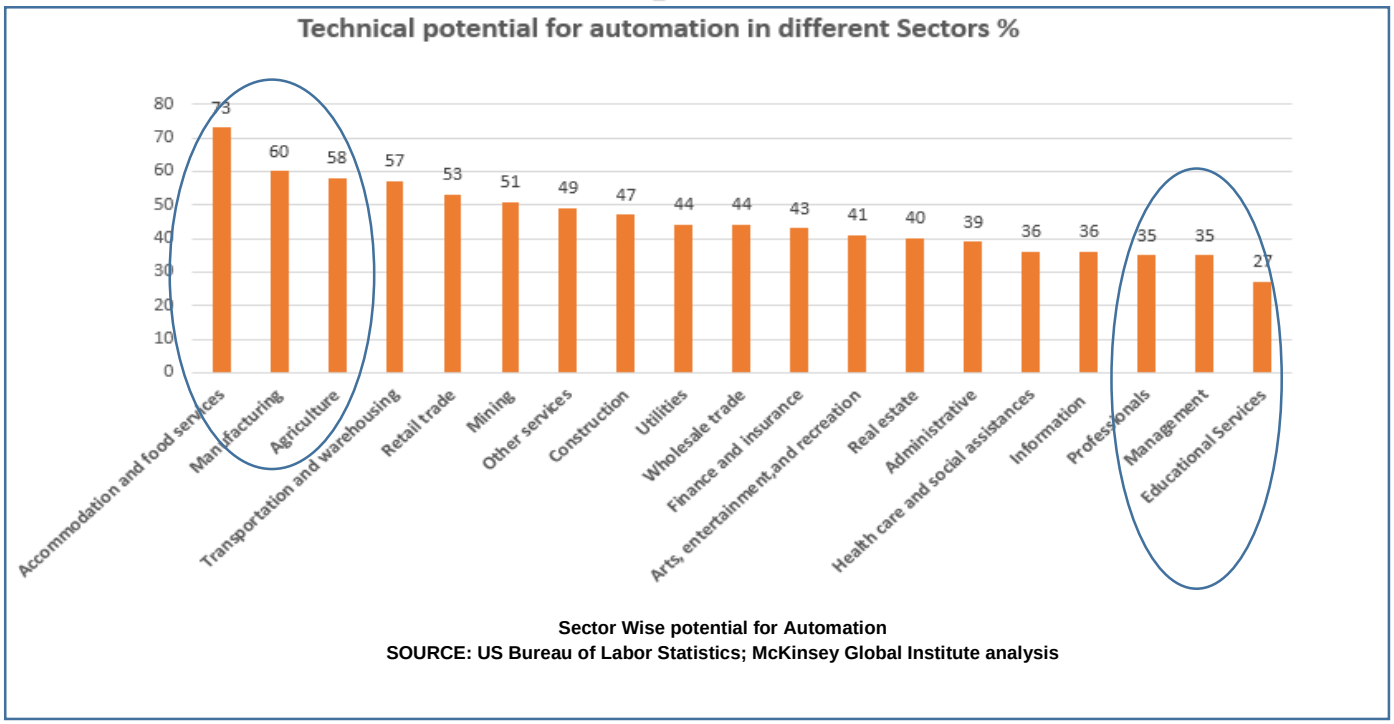
McKinsey Global Institute (MGI) developed several hypothetical case studies to gain a better understanding of the potential for automation in different settings and sought to quantify the economic impact of realizing this vision. The case studies were of a hospital emergency department, aircraft maintenance, oil and gas operations, a grocery store, and mortgage brokering. The value of the potential benefits of automation, calculated as a percentage of operating costs, ranges from between 10-15 % for a hospital emergency department and a grocery store, to 25 % for aircraft maintenance. The study also revealed that automation being deployed today that is already generating real value. For example, Rio Tinto has deployed automated haul trucks and drilling machines at its mines in Pilbara, Australia, and says it is seeing 10–20 % increase in their productivity.

Google has used artificial intelligence technology from its DeepMind machine learning to its own data centers, which is contributing in cutting the amount of energy used by 40 % .( Rich Evans and Jim Gao, DeepMind blog post, July 20, 2016.).

- **Reduction in Production Cost** – Automation can reduce wastages and can leverage quick return on investment (ROI) also can reduce the initial setup costs, helping in reducing the production cost . It can also reduce the cost of the operations staff can be as high as 71% of the total cost.
- **Decrease in Part Cycle Time -** A lean manufacturing line is crucial for increasing efficiency. Robotics can work longer and faster which increases production rate.
- **Improved Quality and Reliability** - Automation is precise process and repeatable. It ensures the product is manufactured with the same specifications and process every time. Repairs are very few and far between. Automated operations ensure that jobs are not forgotten or run out of sequence, that prerequisite jobs are completed successfully, that the input data is correct, and that any special processing is performed.
- **Better Floor Space Utilization** - By decreasing a footprint of a work area by automating parts of your production line, you can utilize the floor space for other operations and make the process flow more efficient.
- **Reduce Waste** - Robots are so accurate that the amount of raw material used can be reduced, decreasing costs on waste.

- **Stay Competitive** - Reduction in schedule and cost attracts customers. Automation helps provide the highest throughput with least amount of spending.

The relative cost of automation can be modest compared with the value it can create. The types and sizes of investment needed to automate will differ by industry and sector. For example, industries with high capital intensity that require substantial hardware solutions to automate and are subject to heavy safety regulation will likely see longer lags between the time of investment and the benefits than sectors where automation will be mostly software based and less capital-intensive.




**Sector Wise potential for Automation**
**SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis**

**Conclusion**

Automation will not happen overnight, and five key factors will influence the pace and extent of its adoption. First is technical feasibility, since the technology has to be invented, integrated and adapted into solutions that automate specific activities. Second is the cost of developing and deploying solutions, which affects the business case for adoption. Third are labor market dynamics, including the supply, demand, and costs of human labor as an alternative to automation. Fourth are economic benefits, which could include higher output and increased quality, as well as labor cost savings. Taking all of these factors into account, it is estimated that it will take decades for automation's effect on current work activities to play out fully. While the effects of automation might be slow at a macro level within entire sectors or economies, they could be quite fast at a micro level, for an individual worker whose activities are automated, or a company whose industry is disrupted by competitors using automation. Automation should be embraced but within certain boundaries, looking at the pace at which it is growing may lead to a very challenging situation in which there may be direct threat to human existence. In those countries where manpower is not available, or some process where human efforts are limited, Automation is justified. However in the countries with huge potential of young manpower automation can be limited. The blue planet earth is known for life and life means sustenance and proliferation of living things. It would be unfair on the part of the earth if Automation generated robots and machine take over human being at mass scale.

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