



Individual Report  
Indus International School  
Topic: Digital world

**How has Automation lead to change employment patterns and job trends?**

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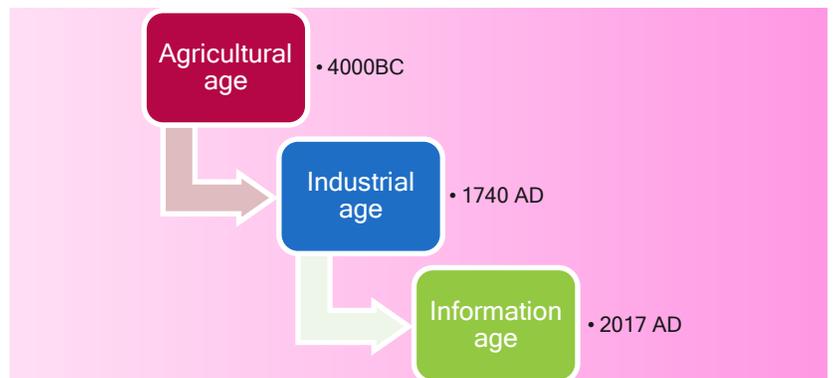
She is an icon of spreading peace across the four corners of the globe. She became a citizen of Saudi Arabia since October 2017. She has a great sense of humour and can empathise. Meet Sophia, the social robot. She has artificial intelligence (AI) and can emote in 50 different ways. She is the creation of Hanson Robotics in Hong Kong and was activated on 19th April 2015. Sophia has been programmed to communicate other humans and is designed to be used in therapy as well as in health care. With her artificial intelligent brain, she can grasp information and learn new activities. Today she can easily work as a waitress, act as a model and sing in a concert. In the future, we might have similar robots like her working around us.



Automation is the creation of technology. Its applications allow us to perform tasks without human assistance. As the diagram shows, automation is evolving in various areas such as information technology, manufacturing, transport, utilities, defence, healthcare and many more. Automation results in the reduction of labour costs, cost of making the product, provide more consistency, increase the quality and performs tasks with a high degree of accuracy. Automation plays a very significant role in certain critical and

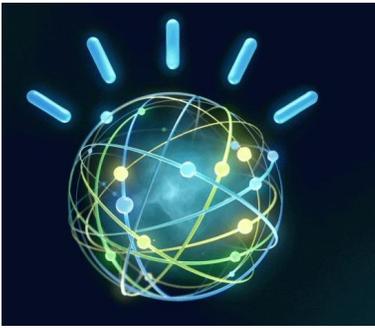
dangerous operations like deep mining, volcanic prone areas, under oceanic trenches and extreme atmospheric conditions where it is difficult for humans to reach. Today tasks such as data analysis, aviation, diagnosing diseases, military surveillance and many more are automated. This has led to a huge change in job trends, pushing us towards an efficient working future. It leaves no option for humans but to upgrade ourselves and adapt to transformation in order to face this revolutionary change.

Initially, people earned their income through agriculture, which later expanded to manufacturing jobs during the industrial revolution. Automation was applied by huge machines doing repetitive and tedious tasks in factories. It used innovation to increase productivity and establish new and better jobs for workers. This was important to stabilise the growing population. It also increased living standards for most of them. After many years, the onset information age, this brought up a huge change in our employment pattern and job trends. For example, the internet, which builds up new industries but does not create a sufficient rate of jobs to cope up with the population growth and to compensate for the jobs it is killing. Like



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blockbuster had 84,000 employees and earned 6 billion us dollars in revenue, but Netflix, on the other hand, had made 9 billion dollars in revenue with 4005 employees only in 2016.

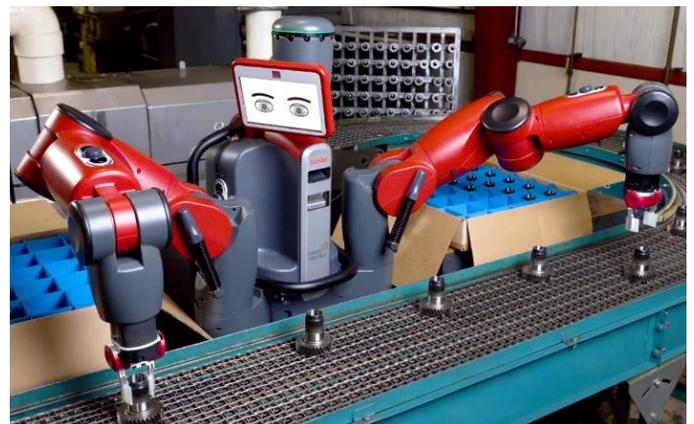


Today software programmers have also introduced AI. It is the intelligence demonstrated by machines in contrast to human intelligence. It allows machines to think, analyses the situation and react appropriately to the conditions surrounding the machine. It allows machines to learn and also provide an educated response. It enables machines to input data and removes a predicted or real product of the combinations provided. For example, Watson is a supercomputer at IBM which can manipulate unorganized data which is 80% of data today and can remove useful information from it. It reads and interprets a text like humans, it can also understand the context of the information and provide an appropriate response. It can not only learn new information but also formulate information and provide different combinations and solutions to problems. Today many experts in medical, law and research grounds approach Watson for combining new information and forming product we humans could never think of. In hospitals, data of various types of cancer as well as symptoms and treatments for various age groups and genders can be set up in Watson's server and when required it can be accessed by doctors not only from the particular hospitals but also from other areas. This allows doctors in hospitals in less economically developed countries can also access to Watson to improve diagnosis for their patients.

The Orlando health care Centre introduces a robot called Betty. She also plays an important role in cancer treatment by completing the patients' distress screening program. The program is a questionnaire the patient fills up about their resent symptoms. Sometimes the patients are not open about their feelings which creates a problem during their treatment. Betty asks questions related to how the patient is feeling. As the mental and emotional health of cancer patients is vital, results projected by Betty allows the doctors to plan the course of treatment. Results show that patients feel more comfortable and are more open to the robot than any other doctor. The doctors feel that Betty has helped to solve a major problem in cancer treatment and they are planning to introduce more Betty robots in the hospital.



So in today's world automation is not machines doing repetitive tasks but it is machined breaking down complex actions to much more predictable tasks, for example, landing a plane. They do this by machine learning. Machine

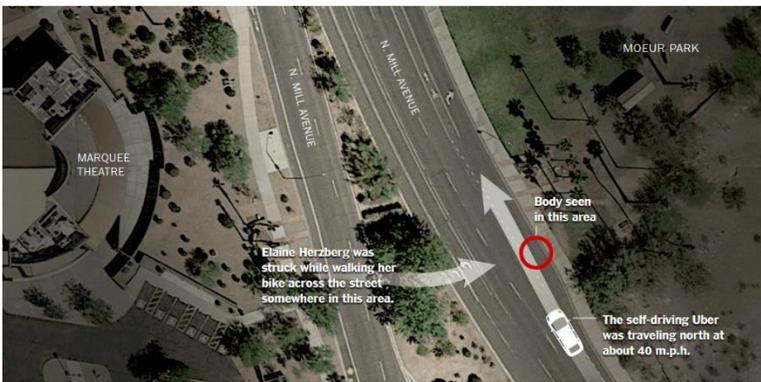


Learning includes software programs analysing data and using it to learn themselves. For example Baxter, an industrial, general-purpose robot who has the vision and can emulate tasks by observing humans and other machines. He is cost-effective because the power used to charge it costs less than the wages of the worker. Sawyer a modified version of Baxter who can perform PCB handling, which is difficult due to its delicate nature of parts and the frequency of line changeover. The ability to think makes us humans unique from other species on our planet.

A common example of this is autonomous cars like the Audi A7. This is because self-driven cars have ultrasonic and radar sensors which provide a 360-degree view and makes them aware of the surrounding. They are also more fuel efficient as they are more precise with accelerating and breaking. Thus they are safer to sit in as there is less chance of accidents, more driving etiquettes can be followed and thus provides us with better driving experience. In addition to this, they are also lighter than regular vehicles as they have fewer safety features. These self-driving cars are employing many drivers. In the US it is estimated that more than 3.1million people would lose their jobs to these automated cars. Unfortunately, this skill does not have an alternative task. So, drivers will have to start off with a completely new occupation or upscale themselves.



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However, a news clip in Forbes May 28, 2018, 10:08 am, states Uber self-driving car killed 49-year-old Elaine Herzberg in Tempe, Arizona at 10 pm while its test. The National Transportation Safety Board reports claimed that the Uber car Volvo XC-90 SUV (a semi-autonomous vehicle) was running on 40 miles per hour, under computer control. The reason found was disabled emergency breaking feature of the car to avoid erratic vehicle behavior as it was on its autonomous mode. This

incident highlights the downside of automation. Moreover, the driver was distracted and the LIDAR sensors of the car spotted the women 6 seconds before the accident. This represents a program default and is one of the greatest failures for autonomous cars and Uber. Moreover, it signifies a human error in both programming and surveillance during the drive. However, it was also important that the lady uses precaution while crossing the road from a non-crossway area. Overall the example suggests that human errors in such automation can cause huge damages such as loss of life.

Businessmen are at an advantage, as automation is slowly but steadily replacing workers in low-level jobs and at the same time working with precision thus reducing the money spent on salaries. They can further invest in the enhancement of the same product or introducing new varieties. Some companies work by a concept called “Lights Out”. Humans are employed to ensure quality assurance and system checking, that is assuring. They are also space savers, as manufactures fit in compact cells of machinery without lighting costs to the company, thus less electricity required for heating and for a small layout or temperature control, affecting the environment positively. Like the MPC industries who have automated their industrial area. But a disadvantage to the situation is that the government might get fewer taxes from the people and respective companies, as these companies would lead to a huge number of unemployment of industrial jobs.



The economy of a country is based on the taxes it gets from its population and consumption of resources. If fewer people will have decent jobs our country will get fewer taxes and the consumption of the resources provided will reduce as a majority of the people won't be able to afford it. Thus the economy of that country will reduce which might increase crime rates in the country.

Universal basic income is a possible solution to overcome the problem of poverty that may be a consequence of unemployment certain amount of money provided by the state to the people residing in it to go above the poverty line. We can do anything with the money provided and it is not taxed. A trial of the universal basic income done in Canada showed that only 1% of the population stopped working in order to look after their spouse. On average, less than 10% reduced working hours in order to look for a better job or to opt for higher education or starting a business. As your basic income never be cut getting a job might improve your financial situation. This would improve the financial conditions of the people. The government supplies this money from military services, shutting down welfare programs and from the taxes from the high society from the population. However, the possible outcomes of the universal basic income are unknown like countries people are also different.

After having researched about automation and job opportunities, I have concluded, that robots are programmed to compliment us and to make our tasks less tedious. Moreover, people need to work to maintain a balance of the economy of the country, otherwise, a majority of the population will be below the poverty line and unable to pay taxes. Some sources that helped me analyses the problem were videos of automation such as Humans need not apply, Wikipedia, newspapers such as Economist Times and Forbes, books such as Rise of the Robots and The Second Machine Age.

Technology is evolving and enhancing each day which is throwing numerous ideas in automation although it has a long way to go. Robots are learning vast information and in the future, they might replace us or compliment us. There are possibilities that one-day robots will move around us, communicate fluently with us and perform activities better than us. They can also start up their community, make friends with each other and us and make our world a peaceful place to live. On the one hand, we have AI which s predicted to think faster than the human

brain, whereas on the other hand acceptance of this fact might create a lot of imbalance in human behavior. The human brain is complex and greedy always wants to achieve more and more. Maybe sometime a day might come when human will finally decide where to limit the research in order to maintain the balance in the ecosystem.

#### References:

<https://en.wikipedia.org/wiki/Automation>

<https://www.youtube.com/watch?v=WSKi8HfcxEk>

<https://www.youtube.com/watch?v=7Pq-S557XQU>

<https://www.youtube.com/watch?v=AtdJ1DGJjXA>

<https://www.youtube.com/watch?v=k139KHS07Xc>

[https://en.wikipedia.org/wiki/Sophia\\_\(robot\)](https://en.wikipedia.org/wiki/Sophia_(robot))

<https://www.rethinkrobotics.com/baxter/>

<https://www.economist.com/the-economist-explains/2018/05/29/why-ubers-self-driving-car-killed-a-pedestrian>

<https://www.forbes.com/sites/meriamerboucha/2018/05/28/uber-self-driving-car-crash-what-really-happened/#668eda634dc4>

<https://www.usatoday.com/story/money/cars/2018/05/24/uber-self-driving-car-crash-ntsb-investigation/640123002/>

[https://en.wikipedia.org/wiki/Artificial\\_intelligence](https://en.wikipedia.org/wiki/Artificial_intelligence)

<https://www.youtube.com/watch?v=i0CFLXXZf18>

[http://ascopubs.org/doi/abs/10.1200/JCO.2017.35.15\\_suppl.e21672](http://ascopubs.org/doi/abs/10.1200/JCO.2017.35.15_suppl.e21672)

<https://www.wftv.com/news/local/betty-the-robot-helps-orlando-health-cancer-center-patients/670207100>

<https://mpcindustries.wordpress.com/2012/09/24/lights-out/>

<https://www.youtube.com/watch?v=h8rVwy6juVM>

<https://techcrunch.com/2017/06/06/audi-is-the-first-to-test-autonomous-vehicles-in-new-york/>

[https://www.youtube.com/watch?v=cXQrbxD9\\_Ng](https://www.youtube.com/watch?v=cXQrbxD9_Ng)