

Based on a newsworthy-research circulated in 2013, the Oxford University economist Carl Benedikt Frey and AI scientist Michael A. Osborne made a serious forecast: by 2033, up to 47 percent of current employment positions in the US economy could cease to exist. The reason? In summary, automation – the procedure by which activities are done especially without the requirement of human work, instead, by the use of robots, software, machines or other kinds of innovation.

As indicated by the investigation, employments opportunities such as sports refereeing, telemarketing, bank credit supervision, insurance underwriting, retail and wholesale deals and notwithstanding providing catering services have a chance of 95 percent or more of being phased out. The rundown continues endlessly, extending across almost all industries.

In the interim, pretty much any other job will be undoubtedly influenced via automation, and an entire scope of new employment opportunities will be made. Just ahead of us are some major monetary and societal changes.

To give you a hint about some of these changes, the following highlights will focus on creating patterns in nine noteworthy ventures that run the extent of today's global economy: production, transportation, administration, law, banking, healthcare, reporting, training, and entertainment.

Having been promoted for decades, mechanical robots are ready to supplant human factory laborers.

During the 1960s, we saw the ascent of modern robots – automated industrial machines that build products without any significant need for human help. Be that as it may, after six decades, the robots haven't dominated at this point. There are as yet a huge number of individuals working in industrial facilities.

Without a doubt, a large number of those manufacturing plants are presently in Eastern nations like China, as opposed to Western nations like the United States. In any case, they're still being operated – and still largely dependent on human efforts. So it is sensible to believe that perhaps the feelings of dread about robots taking over were exaggerated.

All things considered, reconsider. Indeed, even in the East, modern robots are on the ascent, and industrial jobs are beginning to vanish. In China alone, there were 189,000 factory robots in 2014. That number is anticipated to arrive at 726,000 in 2019. Although, a long way from being the last bulwark of manual industrial work, China is presently spearheading completely automated processing plants.

In 2017, a cellphone manufacturing plant in the manufacturing city of Dongguan supplanted 590 of its 650 laborers with robots. It at that point declared its aspiration to further decrease its staff to 20 and in the long run to zero.

The Chinese media hailed the plant as an important achievement, indicating the advancement of the nation towards achieving its Made in China 2025 economic goal. One of the points of that goal is to accomplish a "robotic revolution," as expressed by President Xi Jinping.

Four elements are pushing on that revolution. In the first place, the prices of mechanical robots are on a descent. Secondly, the cost of Chinese manual labor is generally on the rise. Third, present-day mechanical robots' profitability dwarfs that humans: the robots can work at higher rates and with greater accuracy, 365 days out of every year, 24 hours of the day.

The fourth and last factor includes a combination of the previous factors and the fact that Chinese manufacturing plants regularly make items for Western organizations. Given the reducing cost of mechanical robots, the increasing expense spent on hiring Chinese labor and the enormous efficiency associated with automation, those western industries are now being driven to establish their own industrial facilities at home in the West. In this way, they can get rid of the cost of international transportation.

Combine these four factors, and Chinese manufacturing businesses have a solid financial inspiration to automate their various manufacturing activities. That way, they can bring down their costs and keep their corporate customers satisfied.

Be that as it may, various manufacturing employment opportunities will likely be lost, consequently. Certainly, the World Bank appraises that 77 percent of jobs in China are undermined by automation, huge numbers of them in assembling.

Furthermore, that is only the beginning.

Progress in self-driving innovations will soon put drivers of taxis and trucks out of employment.

Envision it's the not so distant future. You're an organization with a multitude of industrial robots turning out your products nonstop, dispensing with a large portion of your manual work costs, ultimately. Be that as it may, despite everything you have one troublesome issue: transporting those products to your clients.

All things considered, that is where the robots come in once more. The transportation business is going to be changed via self-driving vehicles. You're probably aware of the self-driving cars being test-driven on the highways of California – on another note, self-driving trucks are also being developed, with a great deal of money being invested in their development.

Otto is one of the frontrunners in this capacity, and it was just a while ago purchased by Uber for \$700 million.

By 2025, around 33% of every single American truck could be automated. From the outset, they'll just be permitted to guide themselves on highways, however, in the long run, drivers won't be needed to drive the trucks on trickier local roads and streets either. There are currently 3.5 million truck drivers in the United States, so a considerably significant number of people are going to lose their jobs because of this.

At about the same time, Uber, Lyft and conventional cab drivers will begin joining the list of obsolete jobs. In this regard, as well, Uber has been at the forefront.

In 2014, the organization employed nearly the whole robotics department of Carnegie Mellon University in Pittsburg, Pennsylvania, where it's been experimenting with a number of self-driving cabs since 2016. Almost concurrently, Lyft showed interest in the venture, as well, with a \$500 million investment in independent vehicle technology.

Delivery drivers are likewise at risk of losing their jobs. Domino's Pizza is at the moment testing self-driving delivery cars, and Amazon, FedEx, UPS, and DHL have begun developing package delivery drones, and on the subject of drones, there are automated flying cabs currently being built by the Chinese company Ehang, in fact, a few of these vehicles are being used in Dubai, although not extensively.

The eventuality of automated transportation is definitely not far away, and it's correspondingly being propelled by technological advancements. For instance, the sensors in self-driving cars are getting progressively more complex in function, a recently incorporated function makes it sensitive to sudden scenarios, like the case of a dog crossing a foggy street in the dark.

In consequence, from 2015 to 2016, the rate at which human engineers had to restart or abrogate the operation of self-driving vehicles on trial tumbled from 0.5 percent to 0.2 percent.

Before long, that rate will presumably arrive at zero, so, all things considered, the innovation will have completely arrived – most likely by the mid-2020s.

Automatic advancements are currently phasing out salesman and restaurant jobs

Except if you lived somewhere inaccessible in the last decade, you've presumably made various buys from online retailers, for example, Amazon. Obviously, a large number of other individuals have been making purchases.

In consequence, physical stores have been put out of business. In the United States, Radio Shack shut down 552 stores; JCPenney, 138; Macy's, 68 – and the rundown continues forever, in the first couple of months in 2017.

With each shutdown, numerous individuals additionally lose their retail positions. For instance, when Macy's closed down those 68 stores, it terminated the employment of 10,100 laborers. All things considered, around 12 million retail jobs in the United States are as of now undermined by the ascent of Amazon.

What's more, those retail occupations aren't going to be supplanted with Amazon employments. That is based on the grounds that the company needs far less low-level workers than the physical stores.

On one hand, while physical stores need sales reps, clerks, security monitors, and different representatives, Amazon generally simply needs laborers to transfer its products from its stockroom onto trucks. Unfortunately, even these workers will no longer be needed, as Amazon is currently exploring the option of supplanting these laborers with robots.

If you now include automated Amazon's delivery drones as part of the technologies being employed, which timely brings Amazon items to your doorsteps, it's going to be considerably harder for retail locations to rival the online retail powerhouse.

Concerning the stores that endure the online business takeover, they will be changed via computerization too. Effectively, numerous supermarkets have supplanted clerks with self-checkout frameworks, and companies are looking to eliminate other jobs as well.

For instance, the home improvement company Lowe's has created LoweBots: five-foot-tall robots that are furnished with touch screens, speech-detection devices and wheels that enable it to move around independently.

They're now in use in various company stores across the country, where they track stock and help clients find items.

At the same time, automation is gradually dominating the other principal parts of the service sector: the restaurant business. Touch screen tablets for placing request orders are now supplanting counter staff and servers at restaurants like McDonald's and Pizza Hut.

In the meantime, kitchens are not left out of the automation process, at the Zume Pizza chain, culinary robots are now being used in the preparation of food which has reduced required labor by half.

Obviously, cutting labor expenses is a subtle way of disposing of laborers. It is predicted that about 3.6 million occupations could be disposed of in the coming years in the US fast-food business alone.

Automation will before long take over many of the ordinary jobs in the legal field.

Manufacturing plants, retail, restaurant, and transportation laborers – these are all examples of low-status employment opportunities on the socio-economic measure.

So can we say top of the line jobs will be sheltered from the risk of automation? All things considered, some may be more secure, yet a considerable number of them will likewise be at risk. Others will be fundamentally changed.

As it's generally theorized, the more ordinary a job is, the higher its susceptibility to automation. Strictly speaking, the more your activity includes doing mundane activities, the higher the likelihood of a robot or a computer taking over in the near future.

That is the reason many lower-end employment positions will be eliminated; such ordinary jobs like flipping burgers can similarly be done by machines. This could be the fate of some higher-end occupations too.

Think about the legal field. A large number of the undertakings right now performed by attorneys, paralegals, and legal secretaries are fixed by a constant sequence of activities.

Regardless of whether they're preparing real estate contracts, tenant contracts, divorce settlements or wills, these assignments normally include the following order of activities: take a normal boilerplate legal document template, modify it to fit the requirements of the customer and fill in the spaces with the right data.

With the assistance of algorithmic software, online legal enterprises like RocketLawyer, LegalZoom and LawDepot can do this work undoubtedly, they simply have to ask customers a couple of straightforward questions.

Increasingly, more complex assignments are likewise starting to be automated. In 2016, BakerHostetler, one of the biggest law offices in the United States, procured a robotic lawyer named Ross. Driven by IBM's Watson supercomputer, Ross can filter through a great many authoritative records in several databases and decide on which documents would be most helpful in winning a specific case.

Due to automation, as many as 31,000 law-related employment positions have been lost in the United Kingdom alone, it is also possible that about 114,000 more jobs will be obsolete in the following two decades. Correspondingly, in the United States, two out of three attorneys could either lose their positions or see the functions of their positions profoundly changed in the following 15 years. For instance, rather than composing authoritative reports themselves, human legal advisors will simply be revising and editing records composed by robots like Ross.

This is a piece of upsetting news in case you're working in the legal field – yet there's an upside in case you're a customer. Previously, just rich individuals could manage the cost of legal activities, for example, the preparation of prenuptial agreements. Automation will decrease the expenses required for acquiring these services, making them available to people of lower economic status.

As far as bank transactions can be executed online with the assistance of software, the less the business needs human labor.

These days, when you have to do your banking, it's plausible to conduct your transactions over a considerable length of time without ever visiting a physical part of your bank. You can revise your information and transfer money online, and the ATM includes functions that allow you to deposit and withdraw money from your account.

If you can recollect the meaning of the acronym ATM: Automated Teller Machine. The undertakings that are now performed by an ATM used to be specifically carried out by human tellers. Employment positions still exist for those tellers, obviously, however in lower numbers today than in previous years, courtesy of ATMs.

At the end of the day, automated systems are already available in the business banking industry, and they have for a while, and automation will grow in significance in the years ahead. To understand the reason why this is the case, it's useful to review the actual reasons for the existence of banks.

Although this is quite stated too simply, one of their basic responsibilities involves dealing with cash. Presently, a lot of economies are endeavoring to become "cashless" as an ever-increasing number of monetary dealings are completed electronically through credit cards and the likes.

As today's economy drifts away from the use of physical currencies (money), it additionally moves from requiring physical positions to manage that money (bank offices).

Numerous organizations in the financial business are observing this reality and jettisoning physical banks through and through. The outcome: totally virtual banks, for example, Schwab.com and Robinhood.com, which are to a great degree operated using automated computing frameworks controlled by complex software programs.

You don't have to obtain a banking certificate to make sense of the fact that fewer bank offices correspond to less financial employments. In reality, in the created world, up to 50 percent of all bank offices and their representatives could be gone inside the following decade.

In the meantime, big investment banks like JPMorgan Chase and Goldman Sachs are also changing their systems to be automated. They're offering their services on the web and have begun supplanting their human financial experts with software programs. Without a doubt, JPMorgan Chase has turned out to be particularly well invested in this change that, by 2015, it had more software engineers and developers in its employ than either Facebook or Twitter – 9,000 out of its 33,000 workers!

The banks' software programs are very functional. In only seconds, they can make financial computations and projections that used to take human analysts several hours. During the following decade, they could supplant between 33% and 50% of all employees in the financial business.

The job of diagnosis and treatment of diseases will soon be taken over by automated systems

Have you at any point while being ill scoured the internet for diseases linked to your symptoms? At that point, similar to a large number of other individuals, you've just had a taste of the changes automation is bound to make in modern healthcare.

Prior to the onset of online search engines and virtual aides like Alexa, you most likely would have had to consult your doctor regarding your symptoms. Presently it's quite easy to find information about your symptoms and possible causes and cures.

You only have to include specific keywords in your search or by using its voice recognition function you can for example just say, "Hello, Alexa, how would I do mouth to mouth?"

Alexa is quite equipped to give you exact guidelines on the most proficient method to do things like that, and in the subsequent years, virtual assistants will become increasingly advanced – well-equipped to provide answers to pretty much any inquiry you'd pose to your family physician.

At the moment, we'll have the option to constantly oversee, analyze and improve our wellbeing with an assortment of sensors and applications incorporated with our smartwatches, cellphones, rings, and wears, as well as microchips embedded in our skin. These advances are already in effect to some degree.

You can monitor your heartbeat with a Fitbit, utilize a cellphone application to check whether a suspicious skin spot is cancerous or not and even wear a stance-improving gadget that will pass a jolt of electricity through you each time you slump over.

These are only a sample of what might be on the horizon. Soon, as these innovations develop and become more available, we'll have the opportunity to follow just about any aspect of our health and self-determine almost every basic illness. What's more, for diagnosing more important diseases, numerous medical institutions are at the moment utilizing supercomputers like IBM's Watson.

With respect to medical treatment, undoubtedly, the robots are coming – or rather, they're already here. The Israeli tech firm, Mazor Robotics has built up an automated robotic surgeon that has completed 25,000 spinal procedures in the United States.

Also, an American organization called Microbot Medical is creating nano-bots. These robots are small to the extent that they can travel through passages of your urethra, veins and even

the vascular tubes in your brain, tidying them up and fixing the damages they encounter as they go. For instance, they could expel the plaque from your coronary arteries, which would decrease your danger of experiencing a heart attack.

As will be shown in the following section, advancements like these will drastically change the medical field.

Numerous future employment positions in healthcare and related industries will be mainly supportive

With such a large number of creative medical advancements available and others currently developed, healthcare will be as affected by automation as the other fields we have discussed. Soon, we could see automated systems perform as much as 80% of tasks which were previously performed by human doctors

In any case, that doesn't imply that 80 percent of physicians will soon be out of employment. Similar to the legal field, it just implies that increasingly normal undertakings – like doing check-ups and conducting tests – will be automated. That will save doctors the time to do other, all the more fascinating work.

A great deal of it will include assuming the role of an assistant – basically serving as a human intermediary between patients and the different automated systems that will diagnose their illnesses. Suppose one of those frameworks identifies that you're hereditarily inclined to a specific sickness, such as Alzheimer's or diabetes.

With that information, you'll likely need to know how the ailment will affect your wellbeing. How frightened would it be about the possibility of you contracting it? With such inquiries, you'll need a human physician to clarify things in words that are more understandable.

Ultimately, specialists will, in any case, have their jobs modified, which will include: advising patients and helping them comprehend the judgments conveyed via automated frameworks.

In other industries, robots will play similar support roles. For instance, professionals will be expected to check and fix the faulty sensors of the mechanical robots that drive work at the automated manufacturing plants of the future.

When self-driving vehicles are faulty, mechanics will be needed to fix them. Human financial experts will, in any case, be expected to respond to the more specific inquiries that individuals may have about their banking services. Also, human legal counselors will presumably still be wanted by customers of higher economic status, who are less (and can afford) comfortable with automated systems.

Be that as it may, jobs in other industries might be seriously threatened. For instance, recollect those touch-screen requesting gadgets that are being used in fast-food restaurants? Indeed, one of the principal reasons for their usage isn't simply to reduce labor

costs. Notably, given a decision between requesting from one of the devices or placing a request to someone behind the counter, most clients (particularly more youthful ones) favor the devices. They would rather not have any human touch!

However, in other enterprises, that touch will be vital, and these will be the businesses where the jobs of tomorrow may thrive, as we'll find out in the following section.

Automation will empower journalists to indulge in more interesting undertakings in more powerful ways.

As the routine tasks done by people in their workplaces come under the responsibilities of automatic systems, people will have more time freed up to enable them to indulge in more fascinating work. Other than in the healthcare sector, journalism is another area that will benefit from such circumstances.

We now have Artificial intelligence, or AI, programs that can write news stories – however they will, in general, be the sort of stories that are fairly mundane for journalists to write.

The Washington Post, owned by Amazon author Jeff Bezos is a striking case of this. They are at the forefront of computerizing certain parts of journalism. In the 2016 US elections, the news outlet utilized an AI program called Heliograf to cover around 500 local races.

What does its job entail? All things considered, Heliograf just took a local election story layout created by some human journalists and after that entered the information fed in by a human editor.

For instance, if a Democratic applicant won a particular congressional race, Heliograf would consequently incorporate certain information into the story layout: a passage about the candidate's biography, or on how her triumph would influence the power dynamics in Congress.

That probably doesn't sound interesting – and that is exactly the point. Projects like Heliograf will empower media organizations to transfer ordinary news coverage to the computerized systems and let journalists focus on the more fascinating facets of their jobs.

There are long-structure stories to pursue, comprehensive interviews to carry out and expository articles to be written. Those are undertakings that AI is far away from being able to achieve, so people will at present be expected to do them for years to come.

At last, AI programs will before long begin increasing the investigative might of journalists. For instance, recollect the Panama Papers of 2015? It was the biggest information spill ever, comprising of 11.5 million reports that enumerated the devious monetary transactions of some of the world's wealthiest organizations and people.

That's a tremendous amount of documents to filter through, so the International Consortium of Investigative Journalists (ICIJ) made a database with an internet searcher that empowered them to locate specific people and information in the lot.

For instance, they could type in a specific individual's name and obtain all information about his/her financial dealings. Presently the ICIJ is attempting to develop an AI-controlled framework that would empower them to make connections between persons and organizations. It is presumed that this system will be operational in 2019.

On account of automation, the job of the educators will move from transmitting information to inculcating social skills.

If there is a knowledge you have acquired from these highlights up until this point, it's that computerization is going to change numerous industries in the years ahead. Some new employment positions will emerge, on the other hand, others will be disposed of, and the old positions that endure will be drastically changed.

As we can obviously see so much transformation in the economy, individuals should figure out how to adjust – revising their skills to suit their changing jobs or retraining for emerging professions or even industries, for example, computer-generated reality programming (more on that in the following highlight). That implies that the importance of education is going to be at an all-time high.

Education, however, will not be spared from the transformation brought about by automation. Indeed, we're discussing robot educators. There's as of now one available: Professor Einstein – a little, humanoid robot that looks somewhat like the renowned physicist from which it takes its name. What does it do? Indeed, in the event that you ask him, Professor Einstein will let you know in his very own words: "I can walk, talk, show games, predict, and answer all inquiries regarding science."

Sadly, he can likewise lose his internet connection, which made him breakdown while he was being interviewed by the author on TV, which made his creators somewhat embarrassed. According to the aforementioned information, educators don't have to stress over losing their positions at any point in the near future.

Yet, as automated systems like Professor Einstein get more sophisticated, they will assume control over aspects of the fundamental roles played by instructors in student education today.

What are these functions? All things considered, consider what your educators accomplished for you when you were in school (the great instructors, at any rate). In the case where you had an inquiry, they attempted to provide the best answer possible.

In the event that you didn't comprehend their answers to the questions posed, they'd attempt to rephrase them – presenting the answer in a form you could clearly understand, regardless of whether by drawing a suitable analogy or by the use of illustrative diagrams.

All things considered, envision if Professor Einstein could do likewise – just that, in contrast to his human competitor, he'd be accessible all day, every day, and he'd never become exhausted from providing an answer to just about any question posed or devising new explanations.

This would enable human instructors to redirect their present focus away from transmitting information and more towards developing "people skills", including, curiosity, ambitiousness, persistence, collaborativeness, adaptability, empathy and principled behavior.

How could those things be done by instructors? There are powerful ways of achieving this, one of which we will be discussing in our final chapter.

As people have more free time to spare due to automation, the patronage of products from the entertainment and cultural establishment will become more important.

Envision you're a present-day instructor and your students would like to obtain some information on astronomy. All things considered, you could converse with them about it, give them books, show them recordings, give them a telescope or send them to Google, where they can get more detailed information on the subject, courtesy of search algorithms incorporated into google (another reason why your job as an information transmitter is becoming redundant).

In any case, suppose you could launch into space and take them on a cosmic journey to the most distant reaches of the galaxy. Indeed, you can't do that for years to come, yet soon you'll have the option to do the following best thing because of virtual reality, or VR.

The innovation is advancing quickly, and the growing business is getting a huge amount of investment. Google as of now has a VR gadget available, and in 2014, facebook purchased the Oculus VR headset company for \$2 billion. Financial specialists are interested in the financial prospects of VR. In an investigation by Bank of America and Merrill Lynch, the monetary leaders announced that the VR headset would turn into "the one gadget to upset and control the world of innovation."

Mesmerizing VR computer games are on the way – and in the nick of time, in light of the fact that, as you most likely are aware at this point, numerous individuals will be out of work, and they'll require something to do. Here's one conceivable future: a huge number of individuals will be jobless and upheld by a general fundamental salary. Then, the individuals who still have occupations will work for fewer hours, because of automation.

What will individuals do with all their freed up extra time? They'll likely exhaust most of their time taking up different kinds of entertainment and culture, which include, music, TV, computer games, motion pictures, and books.

That is uplifting news for artists in the music industry, movie producers, authors and other lovers of art who work in the entertainment and culture enterprises. As of now, 29.5 million individuals have been employed by those industries all over the world – more than the combined total of employees in the United States, Europe, and Japanese vehicle manufacturing industries!

The more individuals have extra time, the more they'll request entertainment and culture – and the more the economy will require on-screen entertainers, directors, musicians, makers, etc to keep individuals engaged and illuminated.

In this manner, however, physical work will to a great extent be relegated to the past, entertainment and culture may well thrive!

The Robots Are Coming!: The Future of Jobs in the Age of Automation by Andres Oppenheimer Book Review

Throughout the following couple of decades, automation will probably supplant numerous present employees in transportation, banking, law, manufacturing, and the service sector. En route, some new employment opportunities will be created that will revolve around supporting the robots and other automatic frameworks that supplanted those laborers.

Automation will likewise dispose of certain positions and roles in medicine, journalism, and education, however, it will enable employees in those fields to indulge in more fascinating and productive works. Conclusively, automation will extend individuals' extra time, which will augment the consumption of entertainment and culture products.

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