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CONTENTS

AUTOMATION

USE OF AR AND VR IN INDUSTRIAL AUTOMATION
Pratik Malviya

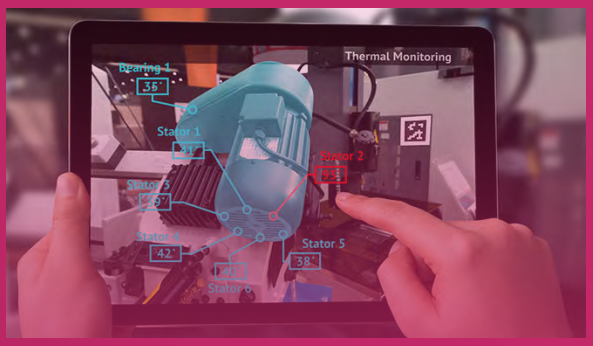
HOME AUTOMATION
Kalash Maurya

AUTOMATION V/S JOBS
Mayur Chavan

AUTOMATION WITH ARTIFICIAL NEURAL NETWORK
Neha Vinamra

INTELLIGENT TRANSPORTATION SYSTEM: A PROPOSAL
Omkar Shirke

ROBOTICS
Sachin Tiwari



USE OF AR AND VR IN INDUSTRIAL AUTOMATION

Industrial process is driven by four main factors which includes safety, training, productivity and efficiency. Technology which serve as an aid to cater these challenges are always welcomed and adopted. Virtual Reality (VR) and Augmented Reality (AR) is among the emerging technology which is providing traction of benefit to them and also is helping in saving costs. Their use cases are not being limited to games and entertainment and is being used to enhance productivity and in solving real world problems.

AR & VR in Product development

In the traditional approach of product development there are number of processes which has to be taken care of which also involves numerous revisions of the concept product, before actual product is to be implemented and bought in to mainstream production. AR and VR can help tackle this problem in many cases, such as development team can have their product design in a 3D modeling using VR device and can also change it on real time basis. Also, the customer can have a check of the product development on real time basis using the AR device and can give his list of recommended changes required and suggestion. Using AR and VR in this way will boost productivity and efficiency in the product development and also will be cost effective.

Effective tool in training factory workers

AR and VR have proved to improve the training of the factory workers in the manufacturing plant and bridge the gap between the skill set required for workers to perform their task. New workers trained with help of these devices have 30%-40% more efficiency and reduced the assembly time. Also, lot of time is saved in documenting training and more than that it saves lot of time in working through those documented training. Using simulation in AR and VR workers have more realistic experience very similar to the actual inline assembly, and its ultimate benefit can be seen by increase in production efficiency even with the newly hired workforce.

Remote maintenance by expert support using AR

AR having the ability to bring the digital realm into our real world, using this capability we can have remote maintenance work carried out under the guidance of the expert technician, situated in any part of the world. Here AR device can help the local support staff to project the real time maintenance work required using the video camera and by getting the inputs from the expert technician on the real time basis over the video shown itself, using augmented reality (AR). This helps in solving the work required easily and quickly with expert solution.

Many companies have adopted the use of the AR and VR in their industrial automation process which includes big companies like 'Volkswagen', 'Boeing' and 'DHL' and all have experienced the benefit AR and VR technology provides to them in making their industrial automation process reliable, efficient and trustworthy.

-Pratik Malviya

Home Automation

The rise in wireless technology and connectivity means that there are now more opportunities than ever to create a home automation system, controlling everything from lighting, heating, to entertainment. These systems use nothing more than voice commands, a visual interface, or a mobile app to create a truly smart home.

About Home Automation

Home automation implies building automation for a home, so that, it would then be called a smart home or a smart house. A home automation system can control lighting, climate, entertainment systems, and appliances. It may also include home security such as access control and alarm systems. Like every other set of technology home automation too relies heavily on the use of IoT. The concept of home automation is based on a centralized system or gateway known as a hub. This hub is the heart of a smart home system. The various devices we use in our homes is connected to this hub via our home network, broadband, Bluetooth, ZigBee, z-wave or and other protocol. The user interface for controlling a home automation system uses either wall-mounted terminals, tablet or desktop computers, a mobile application, or a Web interface (website). It may also be accessible off-site through the Internet.

Take a look at all the best home automation systems of 2020:

Amazon Echo

The Amazon Echo is a leading hub for home automation, using Amazon's proprietary technology Alexa, a voice-powered virtual assistant. The prominent feature of the Echo is that it can work as a standalone device, connecting to a cloud server to provide numerous services like playing music, making phone calls, setting up alerts and times, answering questions, or even relaying weather and traffic reports. The Echo has multiple omnidirectional microphones to make it easy to take voice commands from across a room, and includes multiple speakers to make it easy to be heard. A smaller version called the Echo Dot, released by Amazon also provides similar functionality at half the cost price of the Echo. There are also the Echo Spot, Echo Show, alongwith the Echo Auto, the Echo Plus and the Fire TV Cube; All of which come with Alexa built-in and use the same smart technology.

Google Home Hub

The Google Home Hub is another piece of smart technology for setting up a home automation system. It uses Google Assistant to perform tasks using voice commands, but works mainly as a visual interface. It can display local weather information, events and notices, daily schedules, as well as play music and video from YouTube and other services. In standby phase, it can display a clock across its screen or serve as a digital photo frame by displaying images from our Google Photo account. It also acts as a central home automation hub, and easily connects with many other smart devices. Google Home Hub's speciality lies in its integration with Google Services and more nuanced web searches which is yet more developed than most competitors. However, the limitations in Google Home Hub is that one can't access digital subscriptions the way you can with Chromecast, additionally, while the display is great for close-up interactions, the small 7" screen means it's not so usable when across a room.

Wink Hub 2

The Wink Hub 2 is one of the most versatile of the featured hubs for home automation. The hub itself can be set up in both wireless and wired mode by connecting to router with an ethernet cable. After downloading the Wink app to your Android or iOS device, this smart home system is good to go. The app is used to control everything from inside the app. Through the same app one can select which other smart device they want to connect with, and control their settings accordingly. This means that commands are generally made via a visual interface. As it's all run through a device, you're likely to be carrying around, such as your smartphone or even a wearable smartwatch, there won't be any need to worry about looking across a room for information. However, the Wink 2 doesn't use voice commands by default, but can use any existing voice assistant built into your device, such as Google Assistant or Siri, or you can even use Alexa.

Samsung SmartThings

The Samsung SmartThings hub aims to bring the smart home system together with a single home automation hub. It is operated through a mobile app. Samsung also produce a number of peripheral devices to work directly with it, although, the hub also plays well with most third-party smart devices with some limited connectivity options, mainly restricted to Z-Wave and Zigbee protocols. A notable feature of the Samsung SmartThings hub is that it comes with a built-in battery power option, so that in the event of a power failure the system will continue to run unlike other standalone hubs.

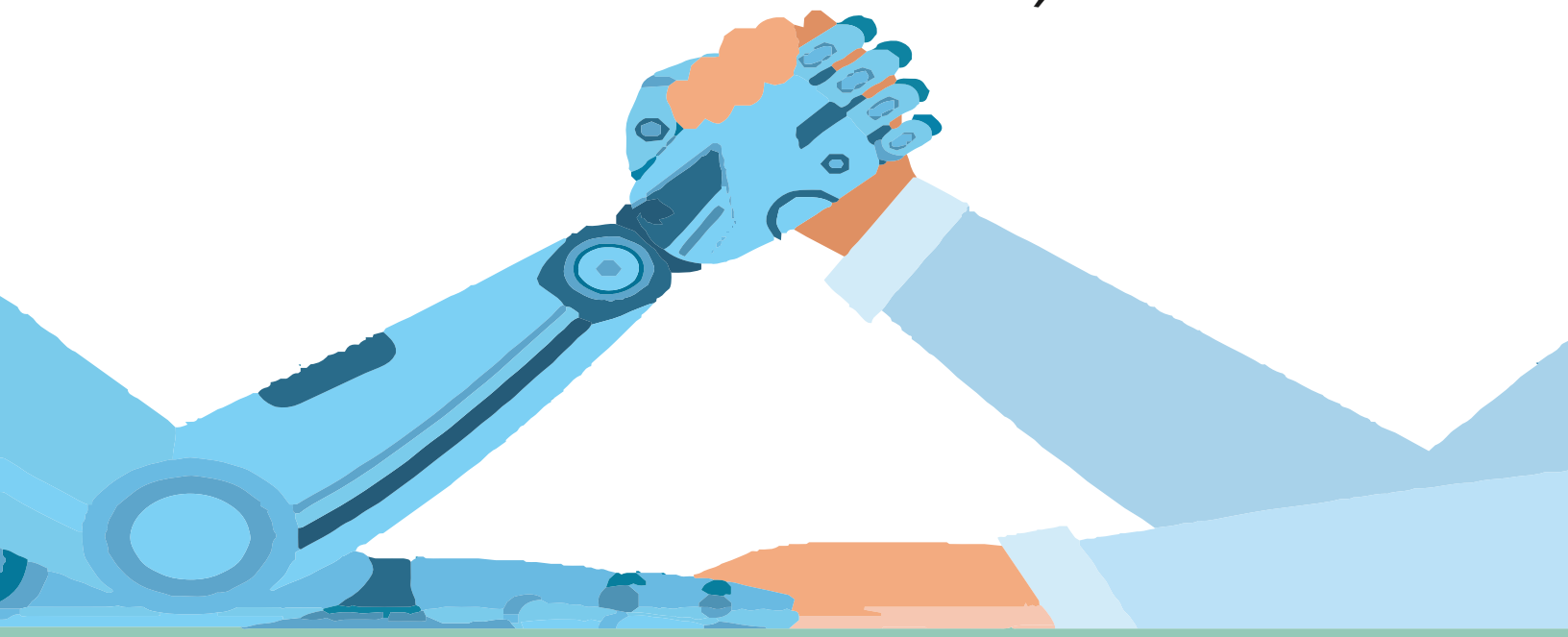
However, the problem in Samsung is with their software, and this shows with the SmartThings app, it isn't as user-friendly as some other app-based home automation systems. All in all, the SmartThings hub can work well for people who are simply looking to set up a smart home automation system, but it is tedious to use with different pieces of hardware.

Apple Homekit

The Apple HomeKit is a home automation system specifically for users of Apple devices, using an iOS or macOS app to remotely control a whole range of smart devices around the home, using either a touchscreen or voice commands using Siri. The HomeKit has been available for a number of years, though a few third-parties originally developed products for it. In recent times the Apple HomeKit supports a wide range of different smart peripherals. The Home app used for controlling the HomeKit still suffers from minor usability issues, connecting new smart devices isn't as automated compared to other home automation systems. Even still, there's now a good range of additional hardware available in terms of audio/video, lighting, thermostats, sensors, and cameras similar to other hubs. Siri voice controls remain highly developed and are often more nuanced than some other voice assistants, allowing you to speak in a more natural and less artificial voice. Overall, while the HomeKit can seem a little more limited in some ways than other home automation systems, it can still deliver a very smart experience.

-KALASH MAURYA

Automation V/S JOB



Automation: The technique of creating an apparatus, a process, or a system operate automatically by computers. Job: A task or piece of work, especially one that is paid (for humans), so can this go hand on hand? let's have look at it! Prone to automation is the high number of service jobs and however few expect that all jobs should be supplanted a couple of robots are as of now working now the robot is more of a gimmick than a substitution of a labourer yet it's a brief look at what's coming. Goal of automation is to reduce employment to almost zero! So, can we live growth fully with no job? Then how we gone we earn? Can we will be able to free to choose our job or there will be only coders/technician? Will be there equality i.e. will have capitalist or socialist economy? Will there be earning for living or living with earing? So, let's have brief look about these questions.

"Work saves us from three great evils: boredom, vice and need." -

Voltaire said very early in 1759 but now in automation world there will be no work now kill to those three evils: boredom, vice and need by following our passion like dancing, music, art, socializing & whatever yours. By monetizing your professional level skill, you can start your earning with leaving. Doing your lovable talent lead to improve mental following by killing vice.

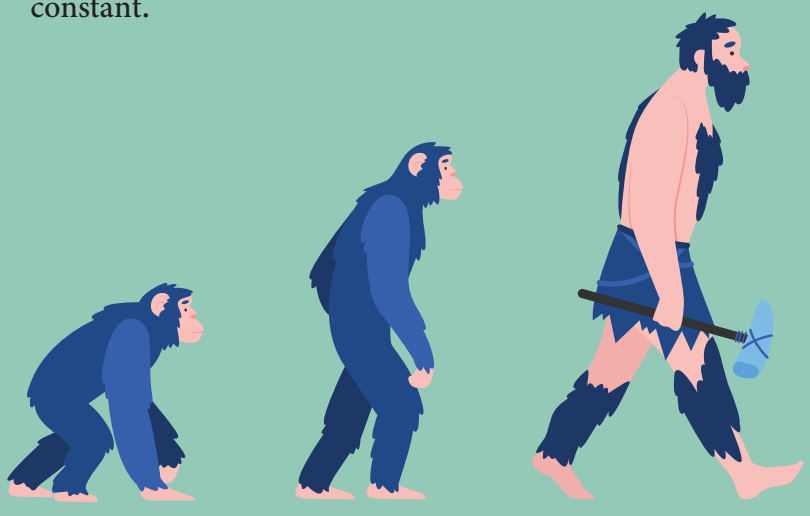
"Choose a job you love and will never have to work a day in your life." –

Confucius. As, workers left farms, emerging industries put them to work. Yet America had more than 100 years to adjust to agricultural mechanization. Now we have to be prepared to adjust in this new era.

A lot of social unrest will be brought about by joblessness before the moral issues of Automation can be tended to. Thus, joblessness will be the most pressing social issue concerning Automation advances.

"We have inspectors of inspectors and people making instruments for inspectors to inspect inspectors."–

Buckminster Fuller Very true line and it started becoming reality then there are opportunities and challenges with automation a change. Though in the past, many jobs have been lost due to technological advancements and large amounts of social upheaval were created. The Luddites was one of the examples and they opposed against automated weaving spread over the English countryside. Opposition was furious to the point that sledgehammer-wielding Luddites assaulted and burned industrial facilities. Change is inherently scary, yet change is only constant.



It's not true that in future only coders/technician are need however major portion of employment will of theirs section. Governments, industries, and organizations can discuss how to encourage expansion of jobs created by Automation to replace jobs destroyed by Automation.

Brynjolfsson: "It's one of the dirty secrets of economics: technology progress does grow the economy and create wealth, but there is no economic law that says everyone will benefit"

Income imbalance will increment as proprietors of Automation capital will grow their wealth while numerous laborers may not get benefits. Also, the compensation hole among skilled and unskilled laborers will increment. Long term joblessness can't be gambled as less salary for families implies low buyer request that lessens pay for organizations in different markets, step by step prompting an endless loop of financial downturn. Well solution to this suggested is Universal Basic Income where money will be distributed unconditionally to citizen. Here main question arise is that how gonna we collect this money apparently some suggested Robot Tax where tax will be collected from automated companies. we can apply this by imposing tax by finding percentage (%) of automated after business is grown so that new tech company also came in market.

At last Job can't win against automation and its exponentially growth but they can win with them! This issue should be in debate to find solution and humans have to address it to maintain health of our self.

We will be experiencing new civilization which will be globally beneficial if we able to build Intergovernmental organization to maintain standard of living of every human.

-Mayur Pradeep Chavan

Automation with Artificial Neural Network

Nowadays automation has gained a great popularity in many leading industries and worldwide sectors. Whether it be a small industry such as manufacturing of biscuits to a large scale industry such as textile industry, all the machinery works are being automated which helps in reducing human work. Modern automated lines are controlled by programmable logic controllers, which are special computers that facilitate connections with industrial equipment and can perform the kinds of timing and sequencing functions required to operate such equipment.

Artificial neural networks (ANNs) are biologically inspired computational networks. Artificial neural networks (ANNs) are excellent tools for complex manufacturing processes that have many variables and complex interactions. Neural networks are utilized to establish a relationship between a set of inputs and a set of outputs. Once the network is sufficiently "trained", a general model is created for the relationship between inputs and outputs. The user can then determine the impact that a specific set of process inputs has on a set of process outputs.

Artificial neural networks are a type of AI that have the potential of increasing the product quality, reducing the reaction time of a manufacturing system, improving system reliability and enhancing its intelligence.

The idea of building manufacturing systems that can function automatically has attracted a lot of attention and created continuous research activities. Recently, artificial neural networks have emerged as a revolutionary AI approach and generated enormous interests in the manufacturing arena.

Most of the applications are simulated in conventional computers rather than implemented in hardware. The development of VLSI (Very-Large Scale Integrated) neural chips will further accelerate the computation speed of neural networks. The development of a generalized neural network for solving different types of large-scale problems is desired.

Artificial neural network techniques are still very new and are developing quickly. We are witnessing fast expansion of neural network-based intelligent machines. Neural networks are an enhancing rather than replacing technology. As most researchers agree, artificial neural networks are not going to replace conventional computer and eliminate programming.

-Neha Vinamra

Managing the increasing traffic is a big problem all over the world. Intelligent Transportation System (ITS) provides solution to these problems with the help of new technologies. ITS is an integrated system that implements a broad range of communication, control, vehicle sensing and electronics technologies to solve and manage the traffic problems. ITS can be used in developing countries like India, Brazil, China, South Africa etc.

Following make up the important pillars of ITS and it may vary according to the demographic of the regions.

Advanced Traveler Information System

implements a wide range of technologies, such as internet, telephones, cellular phones, television, radio, etc. to assist travelers and drivers in making informed decisions regarding trip departures, optimum routes, and available modes of travel. ATIS provides the drivers both en route and pre-trip information which is advantageous in many ways. Pre-trip information availability enhances the self-belief of the drivers to use freeways and allows commuters to make better-informed transit choices.

Advanced Traffic Management System (ATMS)

is used by traffic police department and traffic regulation authorities as a tool to manage and control traffic by monitoring the flow of traffic and making appropriate decisions in a timely manner. Traffic management systems optimize the movement of vehicles, by using real-time information to intervene and adjust controls such as traffic signals to improve traffic flow.

Advanced Public Transportation System (APTS)

is concerned with increasing operational efficiency of all public transportation modes and increasing ridership by making the transportation system more reliable. With the help of APTS the way public transportation systems operate is transformed, and the nature of the transportation services that can be offered by public transportation systems is changed.

Emergency Management System (EMS)

is the newest research field in intelligent transportation system. EMS is mainly concerned with the application of different intelligent transportation system technologies to develop a transport system which can provide help in the emergency conditions.EMS can provide great help in reducing the fatality rate in the accidents.

Some advantages of ITS:

• Improved mobility for people and freight, including greater access to transportation for the elderly, the disabled, and people living in remote locations

• Greater compatibility of surface transportation with the environment

• Fewer traffic-related deaths and injuries

• A better-managed transportation system.

• Less travel uncertainty, allowing for better planned, quicker, and less expensive travel

• So from the above points we can see that ITS covers and improves almost all the
aspects of Transportation engineering.
There are many subsidiaries of the Intelligent Transportation System out of which most
important and widely used all over the world to solve the traffic and transportation problem

-Omkar Shirke

Robotics

What is robotics?

Robotics is an interdisciplinary research area at the interface of computer science and engineering. It's the branch of Engineering which in true terms can be stated as the revolution in the field of Science and advancement of the world. Robotics involves the design, construction, data handling with the help of the robots which are highly efficient in performing any tasks when compared to humans. The goal of Robotics is to design intelligent machines that can assist humans in performing their day to day tasks efficiently. Robotics draws on the achievements of Information Engineering, Computer Engineering, Electronics Engineering, Mechanical Engineering combined.

What is Robotics process automation?

Robotics process automation is the technique that allows anyone today to configure computer software or a "robot" to emulate and integrate the actions of the humans interacting with the digital systems to execute a business process more effectively. RPA robots utilize the user interface to capture the data and manipulate actions just like humans do. The interpret, trigger, respond, and communicate with other systems in order to perform on vast variety of repetitive tasks. Only substantially better the RPA software never sleeps and never make mistakes.

Effect of Robotics on Employment:

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Conclusion:

The economy is being lifted by the new concept of robotics, but we cannot be sure of all the possible benefits. At this early stage, it therefore becomes important to find out the possible benefits/limitations associated with robotics, so that the positives can be capitalized, established, and developed further for the employment and motivation of employees in the various sectors, for overall economic development. Their negatives should also be further studied and mitigated. Advancement and change are the unbreakable rule of the universe and with every advancement there is the change in the job role and not in the number of jobs.

Robotics is one of the upcoming technologies and progress of many growing industries are widely dependent upon robotics. Automation is the sector widely dependent upon robotics for their growth because automation and robotics goes hand in hand.

-Sachin Tiwari