

AN OVERVIEW OF AUTOMATION

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The rapidly innovating technology landscape is changing the way we interact with machines and processes. Starting off as a simple mechanised process, automation is now revolutionising every industry.

AN OVERVIEW OF AUTOMATION

Automation is a phrase that refers to a technology or group of technologies that eliminates or minimises human interventions in design, production and management of products and services. Using various control systems, programmed commands and control feedback systems, Automation technology operates equipment and processes to save machinery and labour costs while improving quality and precision. Automation is excessively used in manufacturing, transport, defence etc. Now, Automation is at the centre of the IT space.

The history of Automation dates to 300 BC where Greeks and Arabs used water clocks to determine time using a feedback controlling mechanism. However, the term Automation was first coined by a Ford Motor Company Engineer D.S. Harder in 1946. It was widely used in the manufacturing industry to automate processes. With the advent of computers and the Internet, Automation became more efficient and sophisticated. Robotics is a notable achievement of the Automation technology. Using Automation technology, industries have created robots with mechanical arms that are used to load and unload products and perform other human-like factory operations.



BENEFITS



Here are some of the key benefits of Automation:

- **Improved quality and consistency:** Automated systems work with higher precision and produces exact products every time, bringing improved quality and reliability to the businesses.
- **Reduced footprint:** Automated tools streamlines processes while optimising the organisational footprint.
- **Minimised wastage:** Automated systems deliver accurate results with minimal wastage. As such, operational costs are reduced.
- **Increased revenues:** As automated systems work at higher speeds and accuracy; productivity is improved as well as revenues. Resources can be optimised to the core.
- **Improved workers safety:** With automated systems in place, workers safety is improved.

THE STATE OF THE AUTOMATION MARKET

The Automation market is rapidly innovating.

According to [Statista](#), the [global Automation market is expected to earn revenues of £180.95 billion by 2021](#). Process Automation is the largest segment here with £63.1 billion market revenues. AI and 3D printing solutions are expected to double their revenues by 2021. Similarly,

Industrial Automation is expected to grow to £32.69 billion by 2021.



According to [Mordor Intelligence](#), the [UK industrial Automation market is expected to earn a revenue of £5.17 billion by 2021](#). ABB UK is the leading robotics Automation company in the UK. It earned a revenue of £642.6 million in 2018, as reported by [Statista](#). A report by OECD survey indicates that 42% of median jobs in England and North Ireland are going to be automated in the coming years.

HOW AUTOMATION IS CHANGING THE FACE OF EVERY INDUSTRY

Automation has changed the way businesses operate and manage productivity. While it reduces time and costs, it has also improved operational efficiency. Here are how industries are fully leveraging the Automation revolution.

AUTOMATION IN THE MANUFACTURING INDUSTRY



Artificial Intelligence, Machine Learning and Advanced Robotics have changed the manufacturing industry landscape. The industry, which was struggling with an economic slowdown, increasing labour wages and shrinking budgets was spiralling downward. However, Automation that is coupled with AI solutions has turned the tables.

There are different types of Automation in the manufacturing industry:

- a) **Fixed Automation:** A fixed process is performed by the machine via programmed commands for low unit costs and higher production rates. However, making changes to the process is difficult. E.g.: mechanised assembly, material handling etc.
- b) **Non-fixed or Programmable Automation:** While the machine is programmed to perform specific tasks, it can be easily customised to incorporate required changes. E.g.: industrial robots, PLCs
- c) **Flexible Automation:** A material handling system uses multiple tools to create multiple products. E.g.: robot arms
- d) **Integrated Automation:** An integrated environment wherein the software, data management and the communication system work together to create products. It is highly efficient and reduces costs and complexities of production.

Automation introduced machine-based production, but it still required human intervention at many stages. However, AI was able to transform these machines to understand complex goals and perform operations with accuracy and without human intervention. As such, recall and repair expenses are significantly reduced. With predictive and preventive maintenance, companies can save huge costs. As automated tools work at different light and heat levels, energy consumption is significantly reduced. Operational efficiencies are improved.

Manufacturing automation can be used for simple task, such as adding a bar feeder to a lathe. As such, small and medium industries can still use Automation at their level. Workers can be insecure about their jobs. However, Automation creates new job roles and opportunities such as skilled maintenance and service technicians etc.

AUTOMATION IN THE BANKING SECTOR



Automation is not new for the banking sector. Automatic Teller Machine (ATM) is a notable example of how customers can automatically withdraw money from ATM machines. With the advent of Artificial Intelligence and Machine Learning, the banking sector is now operating at a new level. Firstly, compliance and audit related processes involving legal professionals, CAs and loan offices account for most banking budgets. With Automation in place, financial institutions are now able to reduce thousands of work hours. A notable example is JP Morgan Chase & Co. This US Bank implemented an AI program called [COIN](#) (Contract Intelligence) to manage commercial loan agreements and was able to reduce 360,000 hours of financial work to a few seconds while significantly reducing loan-service mistakes.



Secondly, the Automation technology has enabled banks to perform risk management that identifies all discrepancies and fraud instances that regularly miss human supervision. Using Data Science techniques, banks can identify future frauds and eliminate them beforehand. Thirdly, credit profiling is automatically done with more precision. As such, banks can offer customised loans to each customer. By targeting high value customers, banks can put special interest on them and reap benefits.

Fourthly, cash flow management becomes easy and efficient. You can automate processes while identifying lean cash cycles so that you can offer discounts for such periods and increase cash balances. Fifthly, the presence of automated solutions significantly improves operational efficiencies while reducing costs. According to [Accenture](#), robotic process Automation (RPA) increases efficiency and reduces costs by 80% while saving 80%-90% of time.

Last but not the least, banks can now use automated chatbots for customer service to increase the customer satisfaction levels. In addition to customer service, chatbots offer lead generation too. A notable example is [Erica](#) used by Bank of America.

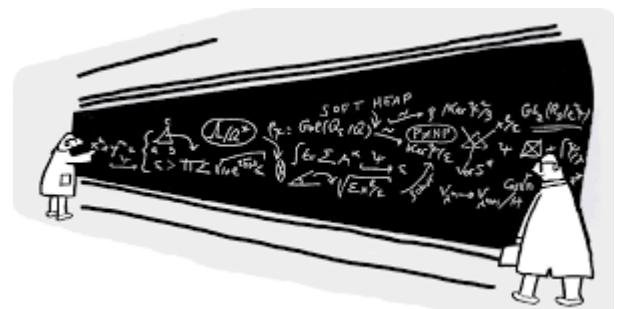


AUTOMATION IN THE PHARMA INDUSTRY



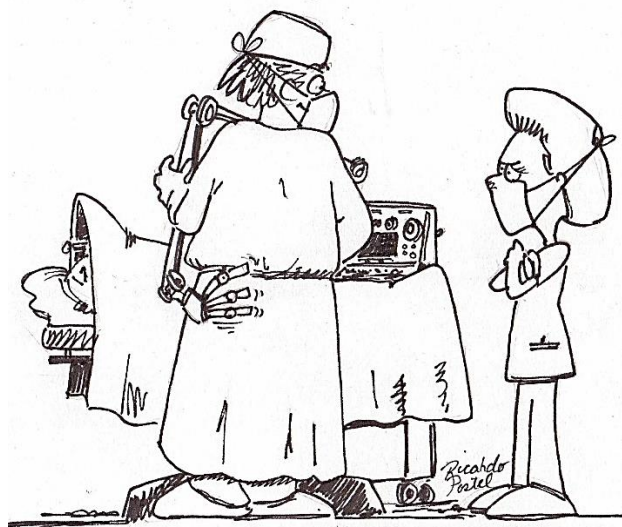
While huge competition and high production values challenge the pharma industry, the biggest challenge is to comply with stringent regulations and compliance standards. To overcome these challenges, the pharma industry is turning towards Automation. As each pharma company manufacturers millions of tablets every week, care should be taken to ensure the right amount of medication, composition and weight is used. Other factors include labelling, cap orientation, collation systems, packing and shipment. With the introduction of robotics, production times are reduced while accuracy and efficiency are maintained.

In R&D, Automation helps companies to study genetics and genomics, patient medical history, family inheritance, etc. to bring personalised medicine to each patient. By analysing huge volumes of genomics data using automated high-throughput screening, scientists can prescribe the best medicine for each patient.



Drug laboratories make use of robotics to automate processes such as drug development, screening and anti-counterfeiting tasks.

Using robotic arms, they can do sample preparation for tasks such as High-Performance Liquid Chromatography (HPLC), Nuclear Magnetic Resonance (NMR) etc. Similarly, the interaction between drugs and its target protein at atomic level can be studied using structural protein analysis



The hospital did not purchase this robotic arm so that you could scratch your back with it, doctor !

With lower production cycles, increased quality, flexibility and compliance, Automation brings better ROI for the pharma industry while overcoming several challenges.

AUTOMATION TRENDS

Automation is innovating at a rapid pace. Here are some of the key trends in Automation.

a) Human-centric and comprehensive offerings

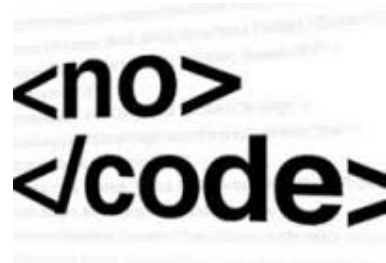
Today, Automation is moving from a single-point solution towards a comprehensive offering, integrating multiple systems and removing Automation islands. In addition, it is becoming human-centric too so that humans operating the systems will understand how Automation is working. This is because developers haven't considered human intervention steps in case of an Automation system failure earlier. This is what happened with Boeing 737 that crashed as the cockpit crew were unaware of the Automation process. For this reason, human-centric Automated solutions are now being developed.

b) DevOps Matures

While Automation controls business processes, Automation is controlled by software programs. As Automation is innovating, software Automation is equally evolving. Today, the software industry makes the most out of this Automation revolution. With the advent of DevOps, software automation is moving to a new level. With continuous design, continuous development, continuous testing and continuous deployment, IT companies can automate software development projects.

According to [O'Reilly](#), teams that automate deployment increased from 74% in 2016 to 89% in 2017. Similarly, 41% of teams fully applied continuous integration (CI) in 2017. Teams that apply continuous delivery (CD) grew from 11% in 2016 to 16% in 2017. Full quality control also increased from 23% to 31% in 2017. Teams that use proper Automation regression testing suites are increasing too. All these numbers show that Automation in software development is becoming mainstream.

Codeless Test Automation is a new trend that enables developers to test the code without writing any testing scripts. As such, software releases are done at very high cadence.



c) Data Science

Artificial Intelligence and Machine Learning technologies are taking Automation to the next level. With Data Science algorithms, companies are not only able to derive business insights, but they are also able to predict future events and take preventive actions accordingly. For developers, Automation tools will handle the tasks of picking up the best systems to execute a process instead of them deciding it. As such, optimisation of resources become easy and cost-effective. It takes IT to a self-learning model.



Analyst firm [Gartner](#) brings a new concept called Hyperautomation that creates a digital twin of an organisation. Here, Automation is not only about automating tools and processes, but it also sophisticates the Automation process, right from discover, analyse and design to measure, monitor and reassess.

In addition, there is a multiexperience trend wherein companies combine multiple technologies such as augmented reality, virtual reality, multi-channel interfaces, IoT networks, multi-touchpoint interfaces and multisensory interfaces etc.

d) Robotic Process Automation

Robotic Process Automation (RPA) is the fastest growing software category in 2018, as reported by [Gartner](#). The company reports that global RPA market earned a revenue of £643.21 million in 2018, growing 63.1%. This value is expected to touch £0.99 billion in 2019. Similarly, [Forrester](#) opines that the global RPA market will grow to £9.12 billion by 2023.

Industry experts predict that more RPA bots will be installed in industries wherein repetitive tasks are done by human resources. As RPA solutions are connected to latest automation technologies that supports APIs, digital transformation of industries is going to massively benefit every industry. However, choosing the right tool and technology is the key here. It is important to understand that RPA tools aren't smart enough to take decisions. They just follow instructions that are predefined. However, AI solutions have to ability to think on their own. So, RPA should be augmented with the right AI and ML technologies. Understanding the different between RPA and AI is the key for developers.

e) Autonomous Things

Autonomous Things is another automation trend that is making waves in recent times. AI augmentation is about augmenting human intelligence rather than trying to replace it.

Here, humans and AI work together in learning and decision making for an enhanced cognitive performance.


With AI augmentation, businesses are now automating the functions of physical devices using AI technologies. drones, driverless cars, robots, autonomous ships, etc. are some of the examples of Autonomous Things using AI augmentation solutions. [Gartner](#) reports that the AI augmentation market will create 6.2 billion hours of productivity that generates a business value of £2.2 trillion.

The Bottom Line

Automation is changing the face of the technology. Today, every industry is using automation solutions in some form or the other. As the demand for automation solutions grows, the need for automation software developers is increasing too. This is the best time to mark a career in the automation software industry. Brightred is here to help!

With several years of rich experience in harnessing IT skills of thousands of professionals, Brightred offers highly talented and experienced Automation software professionals.

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