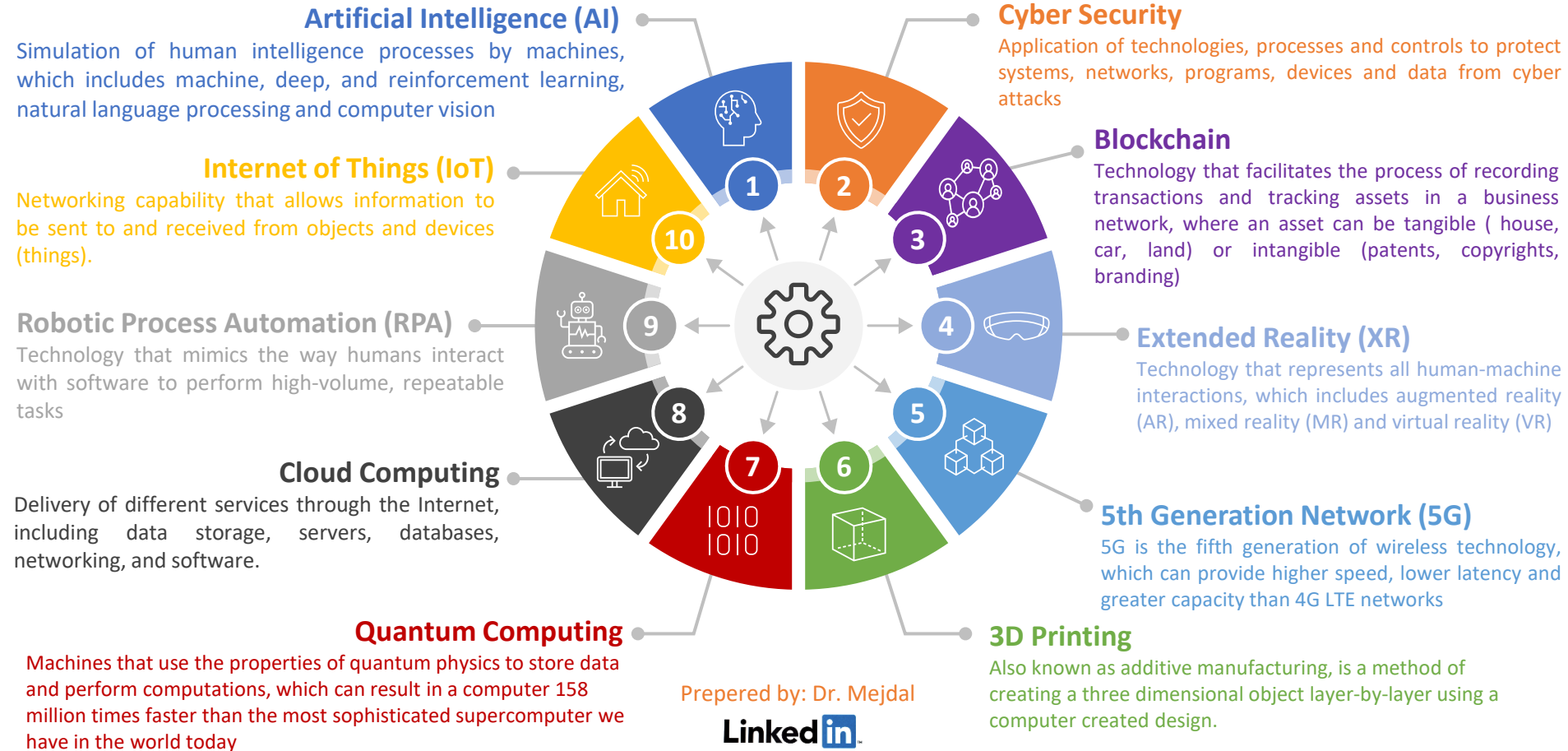


Top 10 Technology Trends

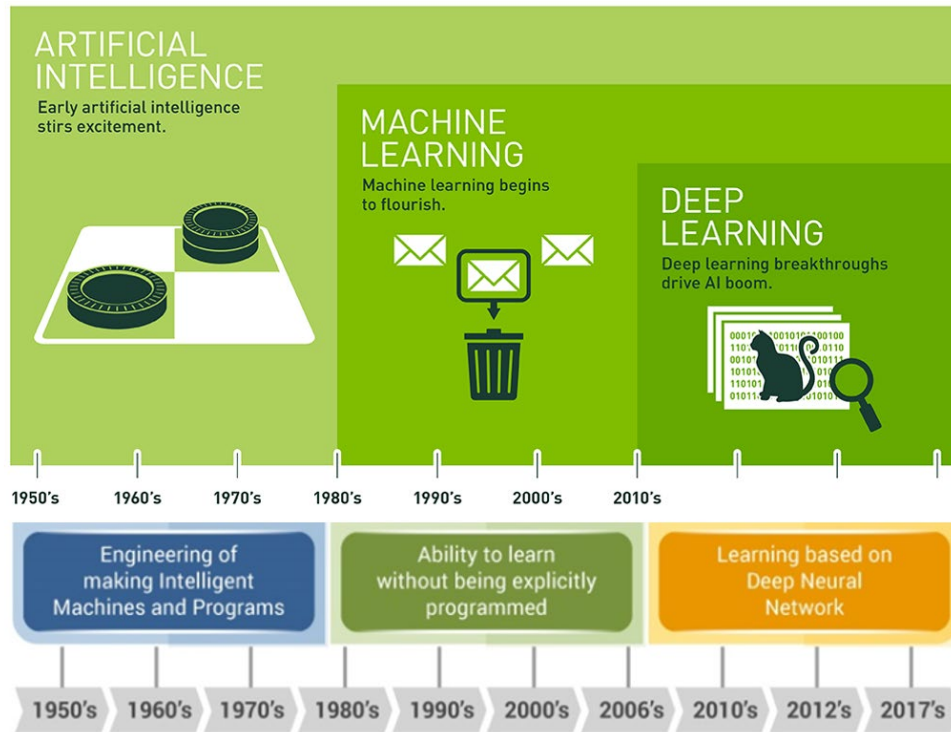


Prepared by: Dr. Mejdal

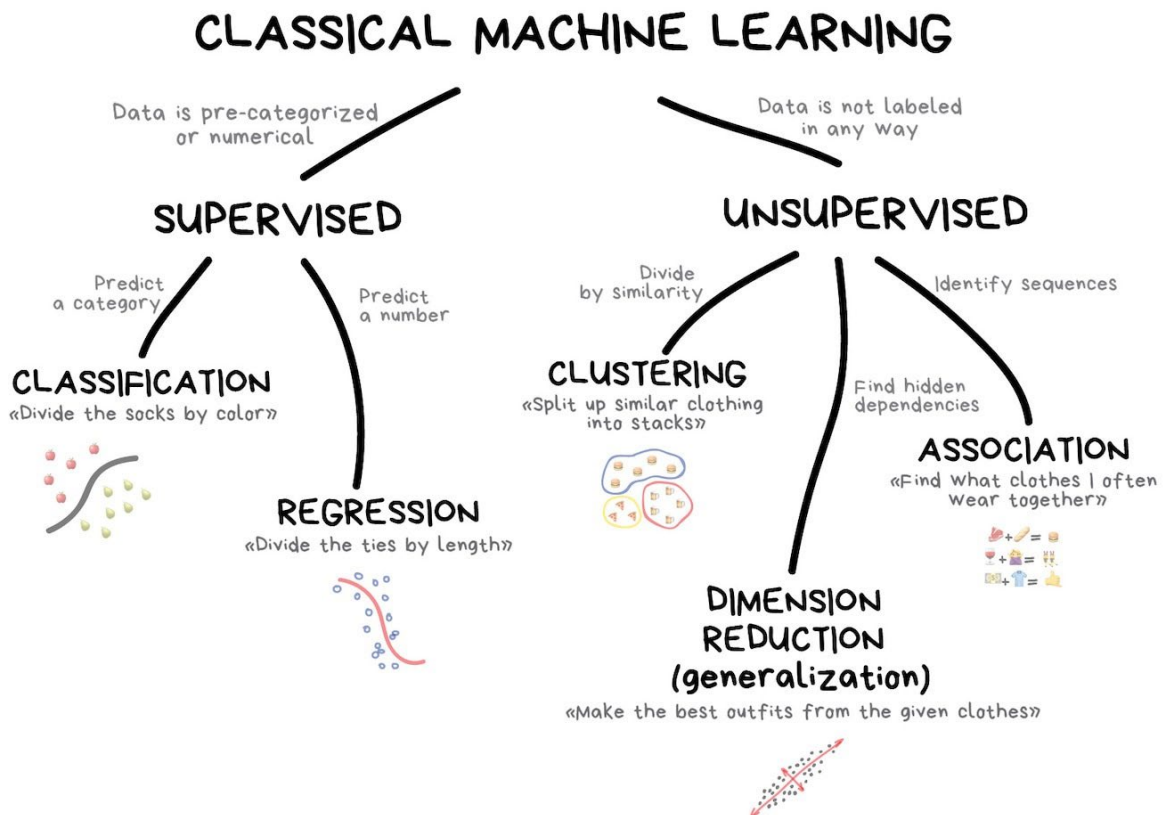
LinkedIn



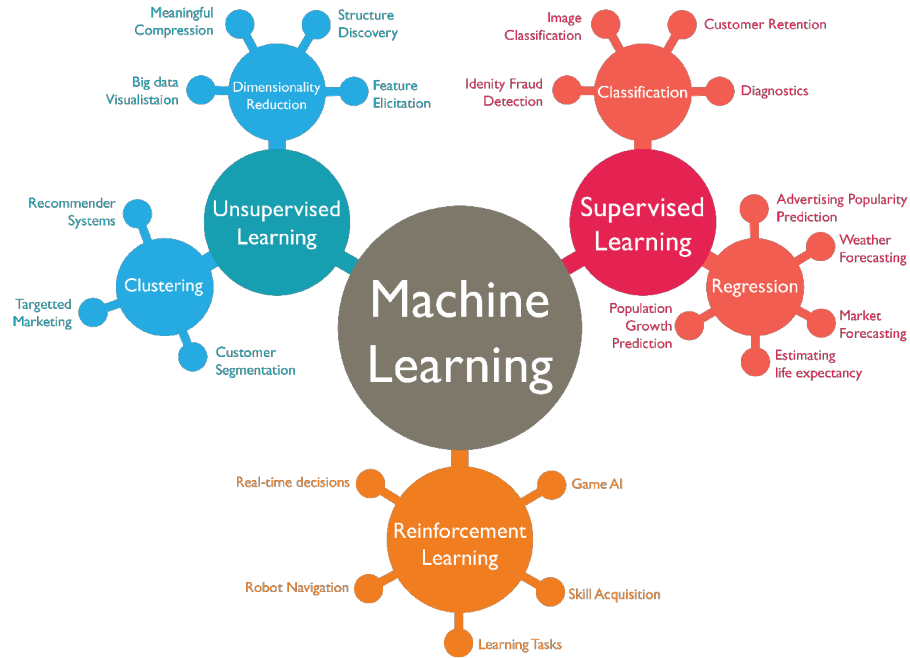
- History of AI



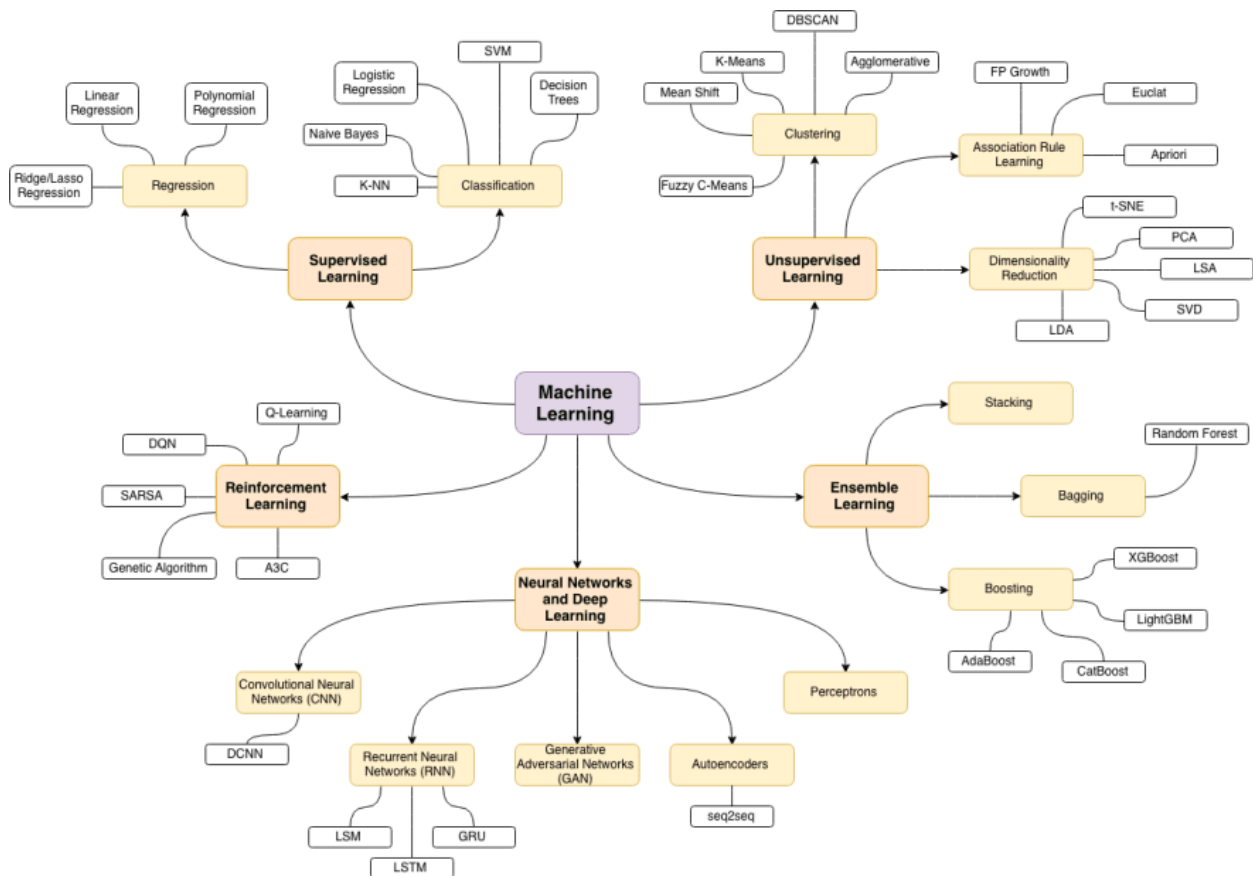
- Structure of Machine learning



• Applications of Machine learning



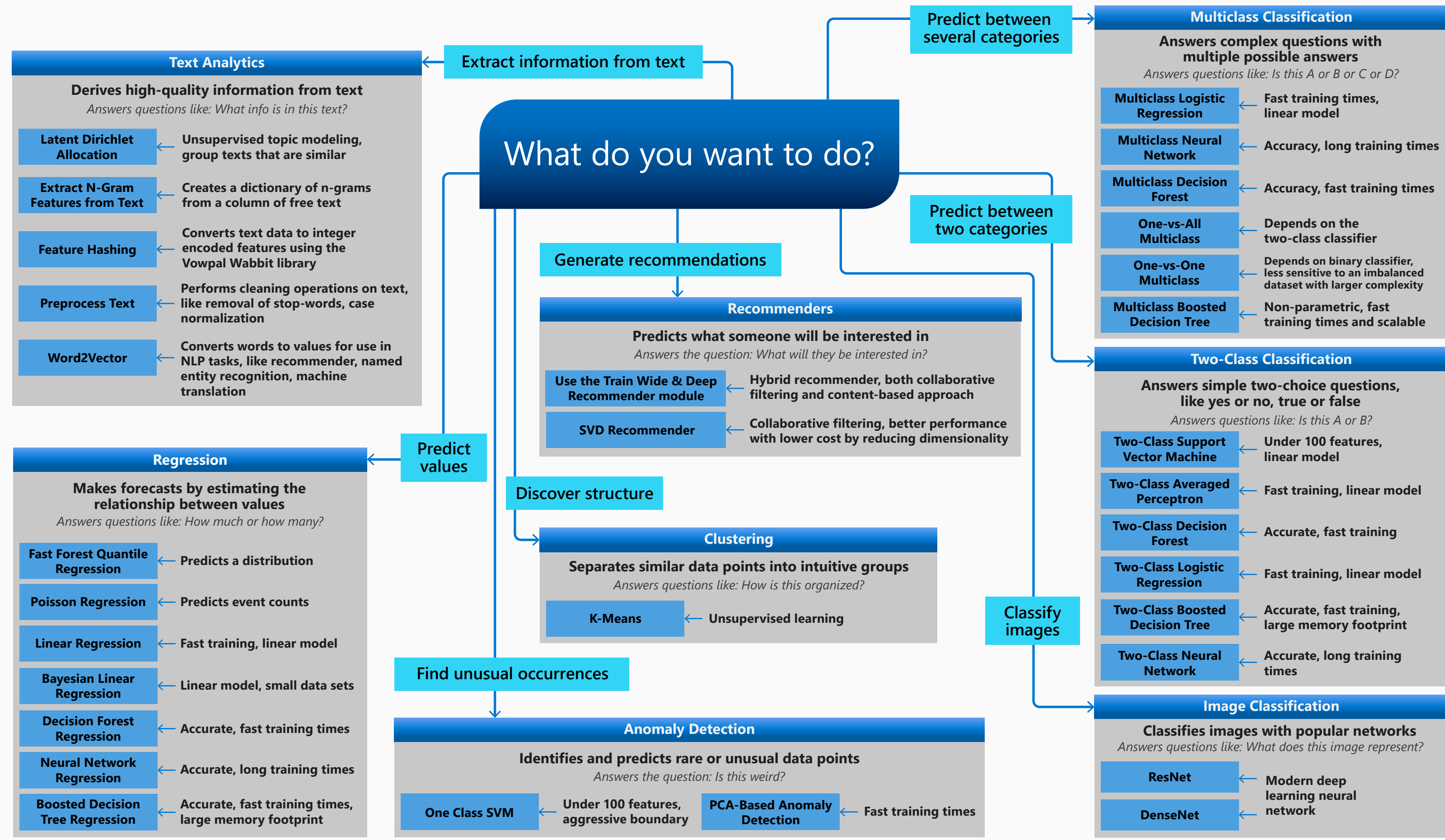
• Top Algorithms of machine and deep learning





Machine Learning Algorithm Cheat Sheet

This cheat sheet helps you choose the best machine learning algorithm for your predictive analytics solution. Your decision is driven by both the nature of your data and the goal you want to achieve with your data.





Cyber Security

Quick Reference Guide

Security Risks

Businesses worldwide are at risk for security breaches. While large, well-known companies seem like a likely target, small and medium-sized organizations and individuals are also at risk. There are many ways data can be compromised, including viruses, phishing scams, hardware and software vulnerabilities, and network security holes.

Did you know?



11% of U.S. adults have had personal information stolen



1 in 5 people have had an email or social media account hacked



98% of software applications are vulnerable



Only **40%** of adults know how to protect themselves online

Confidential Information

When dealing with security, confidentiality means private information is never viewed by unauthorized parties. Confidential information must only be accessible to those authorized to view the sensitive data. Confidential information includes:

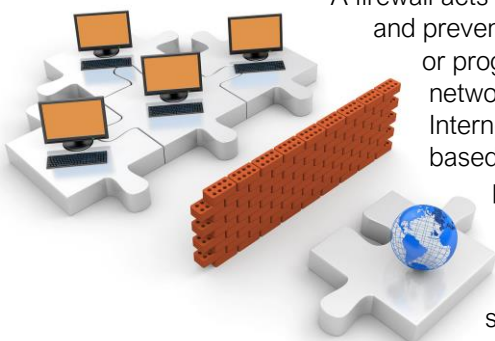
Personal Information

- Social Security Number
- Home Address
- Salary History
- Performance Issues
- Credit Card Numbers

Corporate Information

- Processes
- Customer Lists
- Research and Development
- Business Strategies
- Objectives and Projections

Firewalls



A firewall acts like a security guard and prevents unauthorized people or programs from accessing a network or computer from the Internet. There are hardware-based firewalls, which create a protective barrier between internal networks and the outside world, and software firewalls, which are often part of your operating system.

Passwords

The first line of defense in maintaining system security is using complex passwords. Use passwords that are at least 8 characters long and include a combination of numbers, upper and lowercase letters, and special characters. Hackers have tools that can break easy passwords in just a few minutes.

How Long Does it Take to Crack a Password?

There are 2 kinds of passwords:

Simple

Lowercase letters only

Complex

Upper & lowercase letters, numbers, & special characters

Complex passwords are **EXPONENTIALLY** More difficult to crack

Use them!

Here's how long it takes to crack a password when it's **simple** vs. **complex**

Characters	Password	Time to crack
8	ghiouhel ghiouH3l	4 hours, 7 min 6 months
9	houtheouh Houtheo!2	4 days, 11 hours 1060 years
10	ghotuhilhg gh34uhilh!	112 days 1500 years
11	wopthiendhf w3pthi7ndh!	8 years, 3 months 232,800 years
12	whithgildnzq @hi3hg5ldnq!	210 years 15,368,300 years

Source: mywot.com

Malware

Malware is short for "malicious software." It is written to infect the host computer. Common types of malware include:



Replicating computer program that infects computers



Hijacks your computer or browser and displays annoying advertisements



Secretly tracks your internet activities and information



Malicious program that tries to trick you into running it

Online Browsing

Browsers communicate to websites with a protocol called HTTP, which stands for Hyper Text Transfer Protocol. HTTPS is the secure version of HTTP. Websites that use HTTPS encrypt all communication between your browser and the site.



 <https://www.website.com>

Secure sites have an indicator, like a padlock, in the address bar to show the site is secure. You should always ensure security when logging in or transferring confidential information.



 <http://www.website.com>

Sites without HTTPS are not secure and should never be used when dealing with personal data. If you are simply reading an article or checking the weather, HTTP is acceptable.

Network Security

- Use Wi-Fi password security and change the default password
- Set permissions for shared files
- Only connect to known, secure public Wi-Fi and ensure HTTPS-enabled sites are used for sensitive data
- Keep your operating system updated
- Perform regular security checks
- Browse smart!



Email and Phishing

A phishing email tries to trick consumers into providing confidential data to steal money or information. These emails appear to be from a credible source, such as a bank, government entity, or service provider. Here are some things to look for in a phishing email:

Grammatical Errors

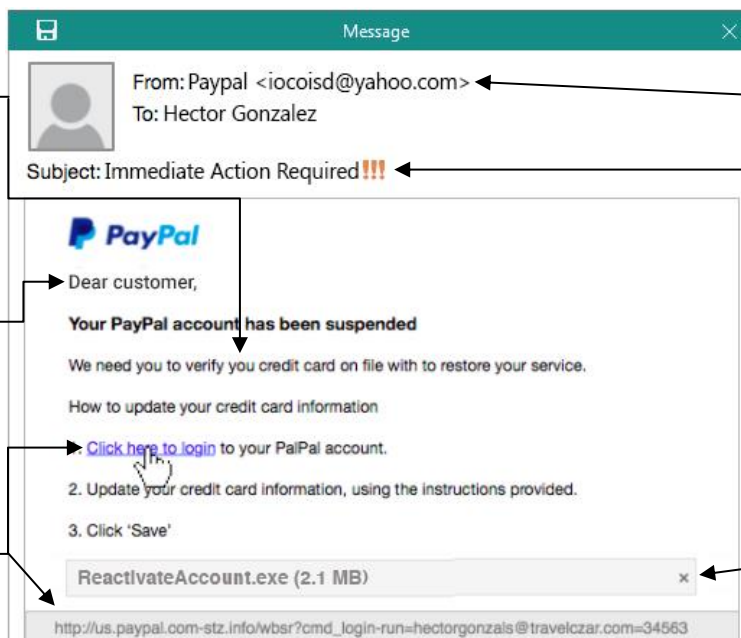
Spelling mistakes and poor grammar

Generic References

Not being addressed by your name

Hover Link

Always check where links lead before clicking



Sender's Address

The address should be correlated with the sender

Immediate Action

Beware of anything that calls for urgent action

Attachments

Never open an attachment you aren't expecting



Blockchain

Blockchain is a shared, immutable ledger for recording transactions and tracking assets in a business network. With blockchain technology, companies can establish a transparent supply chain, verify the authenticity of product claims and gain consumer trust.

Overview	Challenge	Solution	Results
Connecting through Blockchain – Increasing productivity and profitability.	How to track devices through a supply chain in the medical devices sector?	Each supplier was invited to the blockchain, added data about the parts they were making, and added status.	Able to view the origin of raw materials, have an estimated delivery of parts from 30 different suppliers, and guarantee provenance of medical grade products. This led to a significant increase in productivity, approximately 5-10% increase in turnover due to increased capacity, and 70% reduction in manual report creation.
Food and Beverage Traceability – Showcasing the truth of your product.	How to create a safer and more transparent supply chain?	Used blockchain technology and included a QR code on food and beverage products to allow the customer to see exactly how the product was made.	Using blockchain enhanced the transparency of product information, reduced food fraud, and waste. It increased food safety and profitability among food suppliers. And it improved consumer information, boosting trust & sales. <u>See how a County Down enterprise uses blockchain to reveal everything that a consumer would want to know about their beer!</u>



Immersive Tech

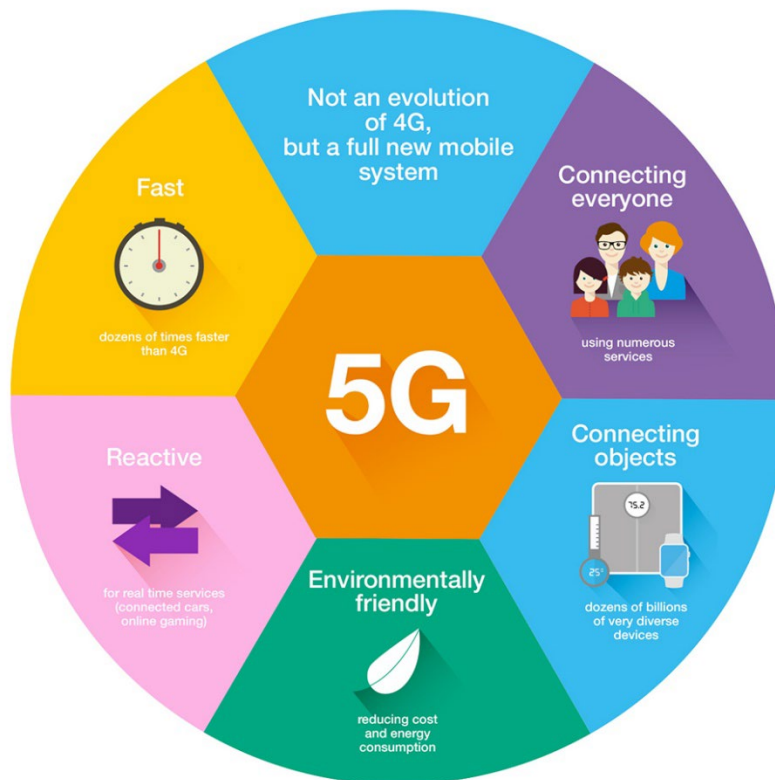
Immersive technologies create experiences by merging the physical world with a digital / simulated reality. Augmented reality (AR) and virtual reality (VR) are the two main types of immersive tech. AR blends computer-generated information onto the user's real environment. VR uses computer-generated information to provide a full sense of immersion.

Overview	Challenge	Solution	Results
VR versus Covid-19 – Continuing business remotely.	Due to Covid-19, restrictions a company who delivered forklift driver training was unable to provide practical instruction sessions.	Use of virtual reality to train construction workers to use a forklift remotely. <i>Also being used to deliver Health & Safety training to oil rig workers before they are deployed.</i> <i>VR is being used to show potential apprentices what experience they would receive without distracting workers from their activities.</i>	Training occurred remotely using VR for the first two days, then onsite with the forklift on the 3rd. This improved productivity, as the forklift became available for work purposes for two days, when it was previously required for training.
Adding value through AR – Business growth in a post Covid-19 environment.	An interior design consultancy was struggling with a lack of business due to Covid-19 restrictions. Designers were unable to visit customers' homes.	Customers used AR to take measurements, and designers were able to create and place items within their 3D world.	They were able to survive Covid-19 by bringing their business online. Also, they can now access a wider client base and scale their business, as with AR their market is no longer restricted by distance.
Creating Tourist Destinations using AR – increasing visitor numbers & revenue.	Tourists, day trippers, and locals are all looking for new experiences.	An interactive AR app to create a huge scale solar system trail. There is also an app for those following the trail giving information on the planets and solar system.	Will reach millions, bring people together and showcase UK creativity globally. <u>Read more about Northern Ireland's Our Place in Space – a 3 dimensional sculpture trail, interactive AR app!</u>

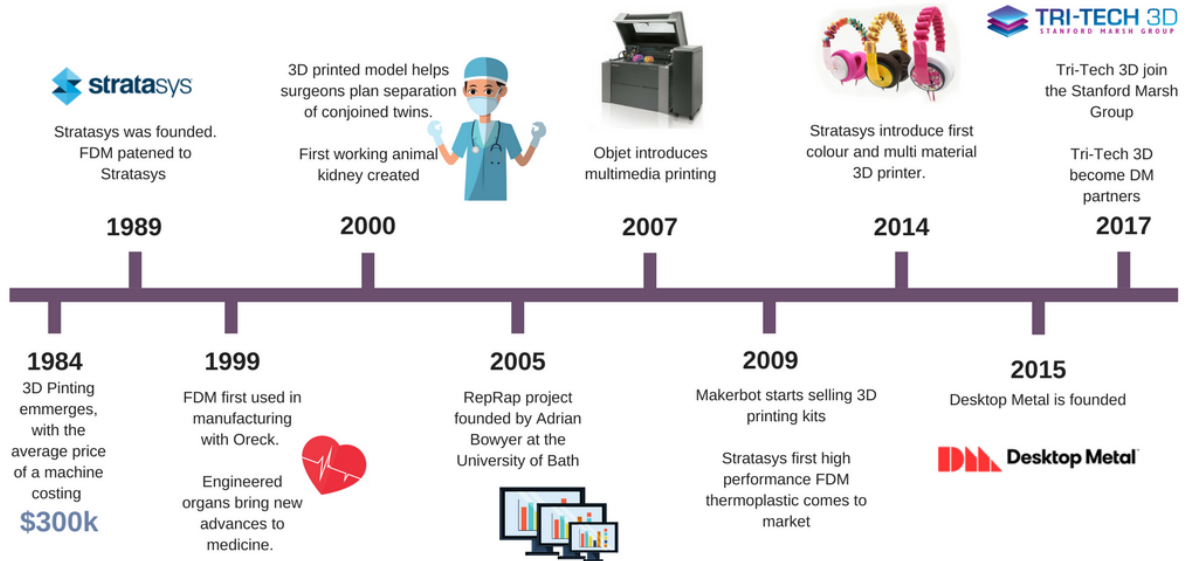
- History of 5G network



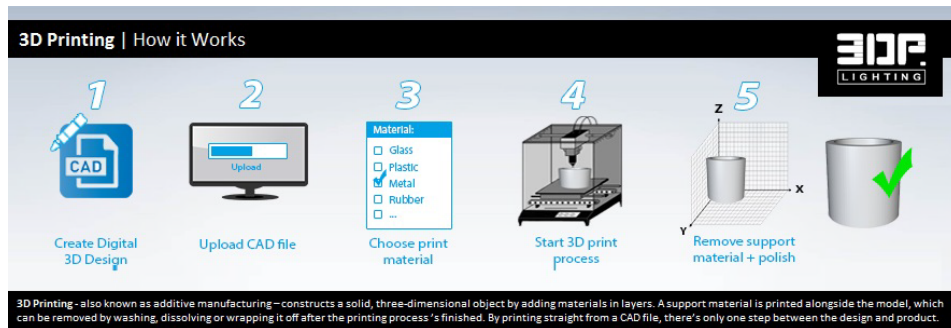
- Advantages of 5G network



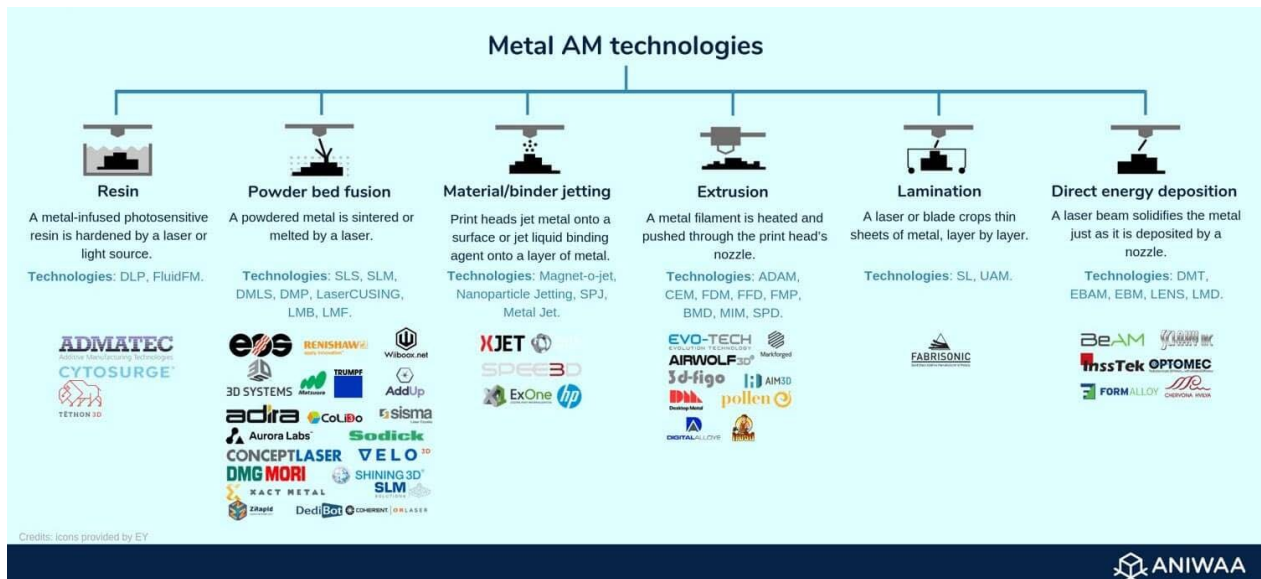
History of 3D printing Technology



How 3D printing works?



Type of 3D Printing Technologies



Introduction

Our manufacturing industry generally – and 3D printing specifically – is driven by innovation. Indeed, key technological developments and new applications in industrial-grade 3D printing, or additive manufacturing, continue to advance this technology, which has only been around for a little more than 30 years.

Designers and engineers can now choose from several distinct classes of 3D printing technologies. Your choice of “tool” just depends on what it is you’re designing and what its final application is. Here’s a brief roundup of some of the main industrial-grade 3D printing options:

Source: <https://www.medicaldesignandoutsourcing.com/3d-printing-options-medical-device-development/>

Stereolithography (SL)

Stereolithography (SL) uses an ultraviolet laser that draws on the surface of a liquid thermoset resin to create thousands of thin layers until final parts are formed. SL is used to create concept models, cosmetic prototypes, and complex parts with intricate geometries.

Selective laser sintering (SLS)

Selective laser sintering (SLS) uses a CO2 laser that lightly fuses nylon-based powder, layer by layer, until final thermoplastic parts are created. SLS produces accurate prototypes and functional production parts.

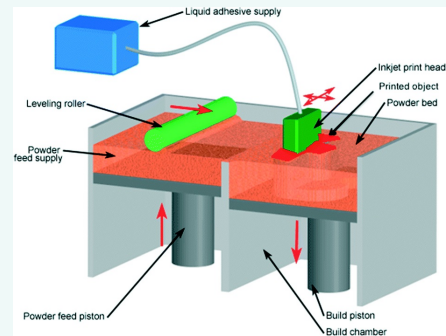
Direct metal laser sintering (DMLS)

Direct metal laser sintering (DMLS) uses a fiber laser system that draws onto a surface of atomized metal powder, welding the powder into fully dense metal parts. DMLS builds fully functional metal prototypes and production parts and works well to reduce metal components in multipart assemblies.

PolyJet

PolyJet uses a jetting process in which small droplets of liquid photopolymer are sprayed from multiple jets onto a build platform and cured in layers that form elastomeric parts. PolyJet produces multi-material prototypes with flexible features at varying durometers and is often used to concept overmolding designs.

3D Printing



Fused Deposition Modeling (FDM)

Fused deposition modeling (FDM) works by feeding a filament or spool of plastic into a heated nozzle, which then extrudes successive layers of thermoplastics onto the workpiece. FDM offers a wide thermoplastic material selection and is leveraged for iterative prototyping.

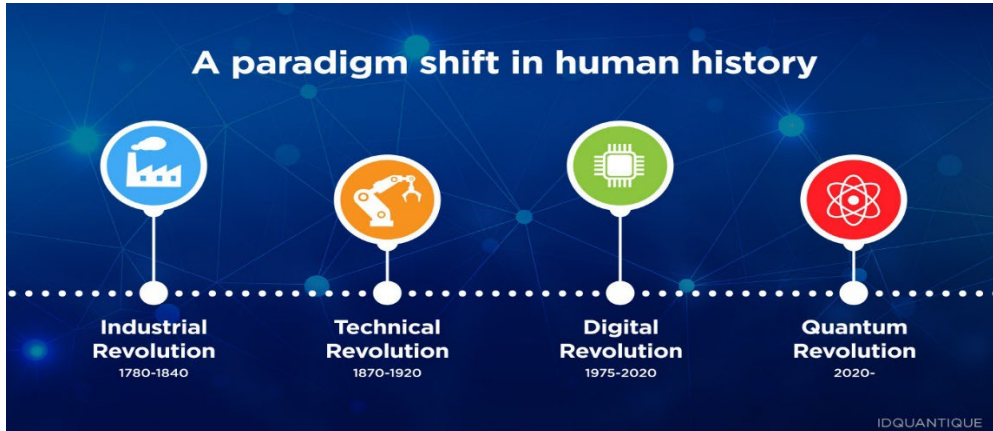
Continuous Liquid Interface Production (CLIP)

Carbon is the name of the company that is using a process called CLIP, Continuous Liquid Interface Production, which builds parts from the top down, unlike other additive technologies that work from the bottom up. Final plastic parts exhibit excellent mechanical properties and surface finishes.

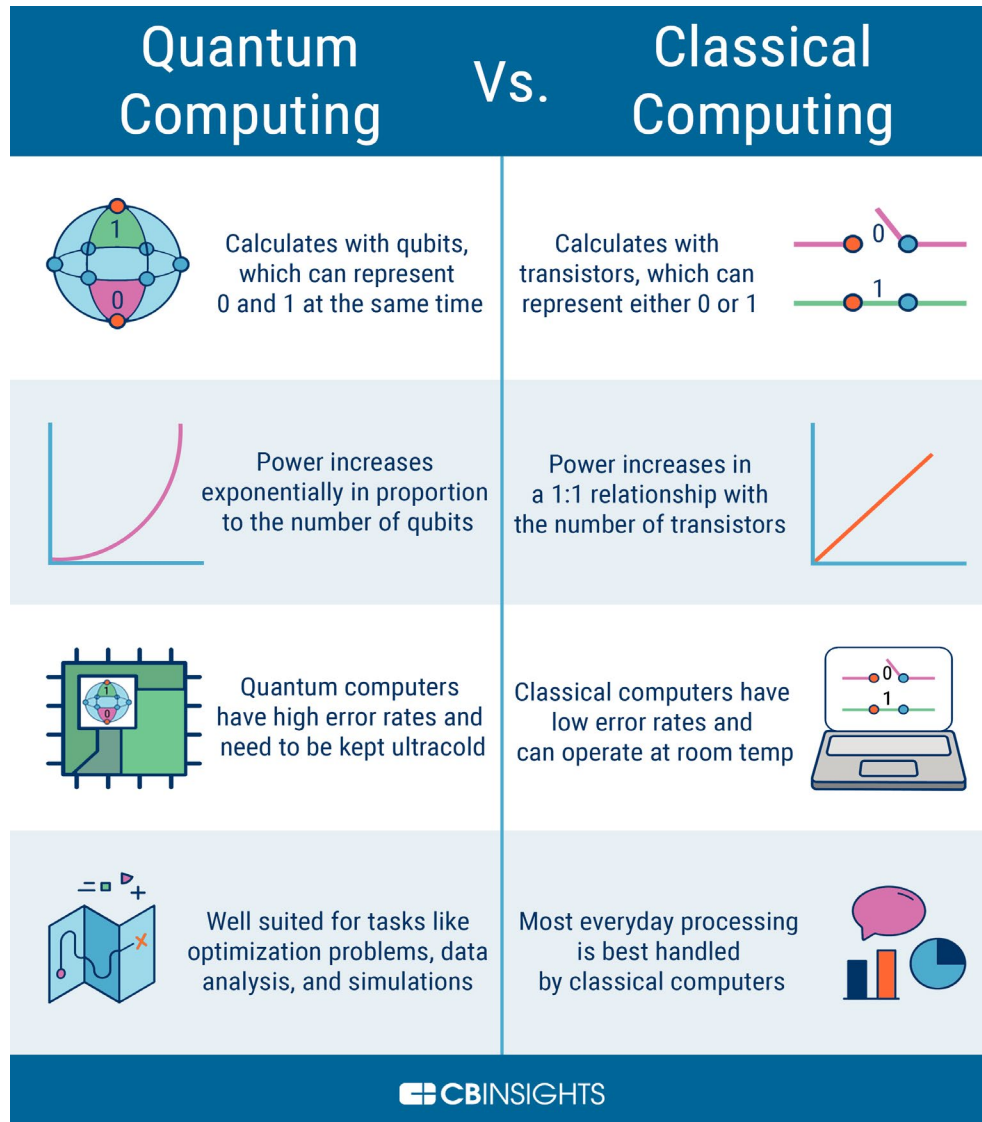
Multi Jet Fusion

Multi Jet Fusion process selectively applies fusing and detailing agents across a bed of nylon powder, which are fused in thousands of layers by heating elements into a solid functional component. Final parts exhibit improved surface roughness, fine feature resolution, and more isotropic mechanical properties when compared to processes like SLS.

- History of Quantum computing



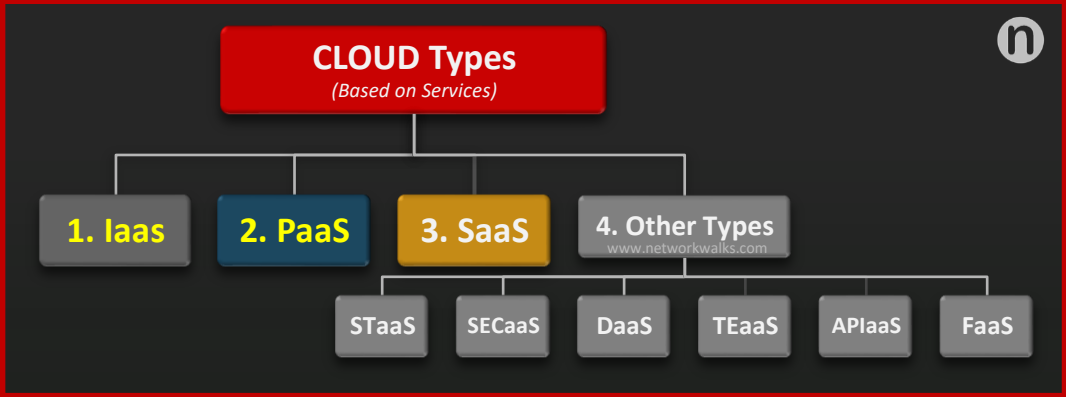
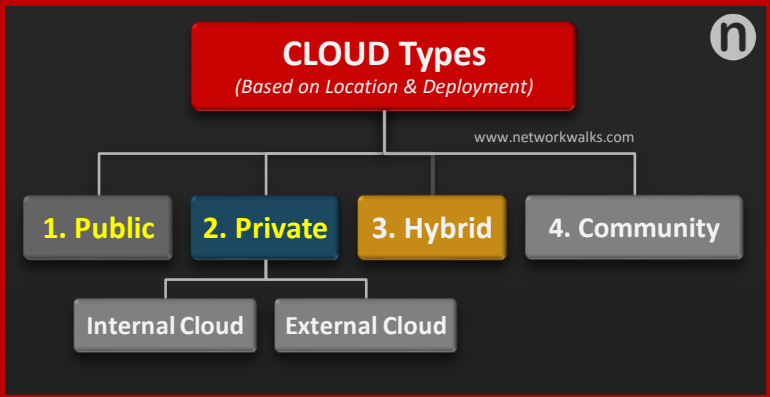
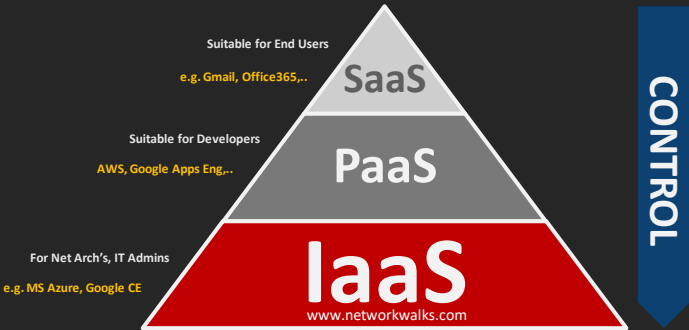
- Classic computing vs Quantum computing



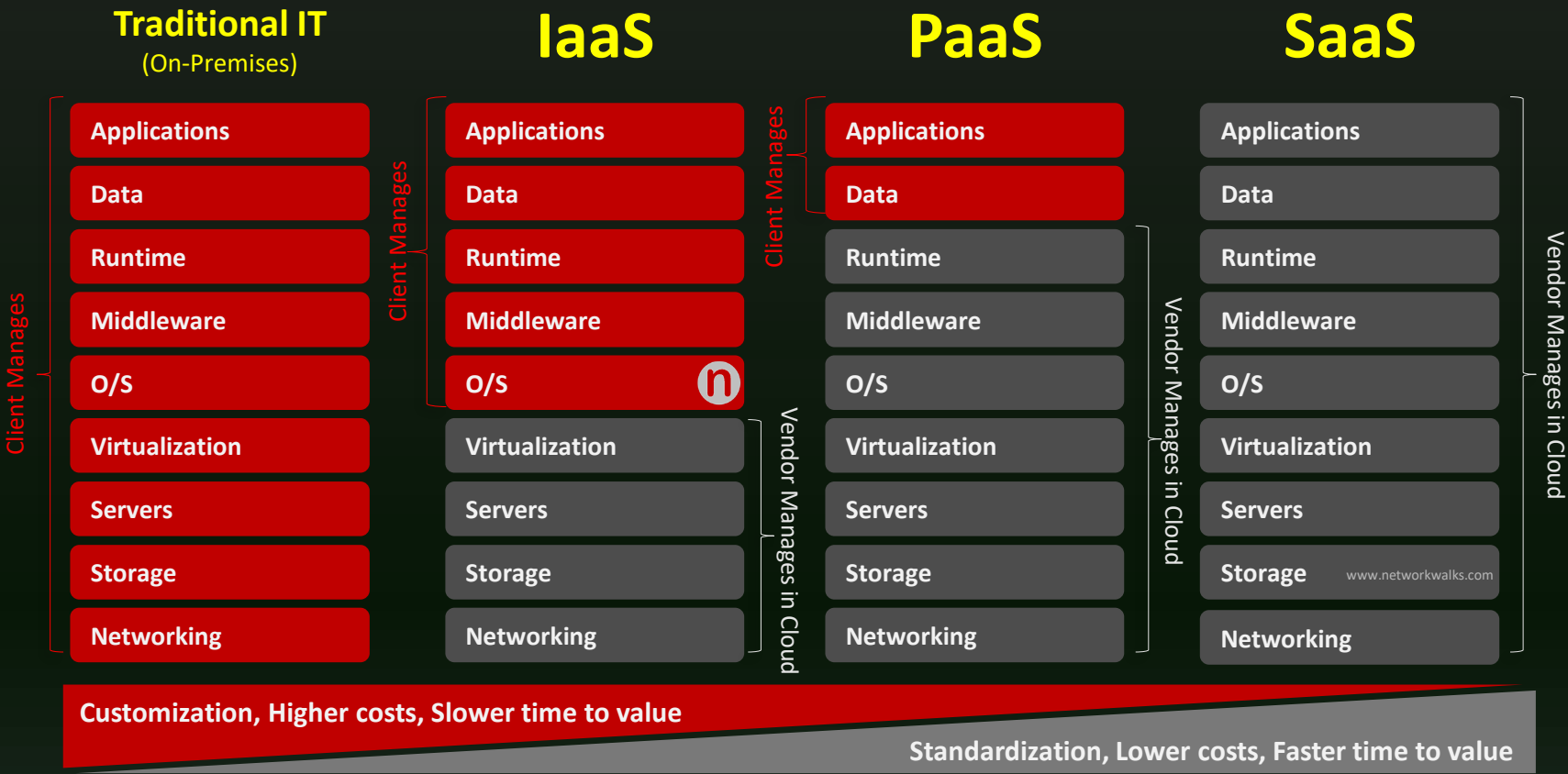


What is Cloud Computing ???

“Cloud Computing is an approach to offer IT Services to customers remotely is called Cloud Computing”



Cloud Computing Models



Advantages of Cloud Computing	Disadvantages of Cloud Computing
↑ Cost Effective (Low CAPEX/OPEX) ↑ Scalable, Standardized Model, Highly Reliable ↑ Quick in Deployment, Easy Disaster Recovery, Flexible	↓ Less Secure ↓ Limited Control (especially SaaS/PaaS Models) ↓ Requires Extra Bandwidth



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ROBOTIC PROCESS AUTOMATION CHEAT SHEET

RPA Basics

RPA

RPA is a **Robotic Process Automation** which is used for automating the current workflows with the help of robots to reduce human intervention at every point

Robotic: Machines that mimics the human activities and actions are called as **robots**

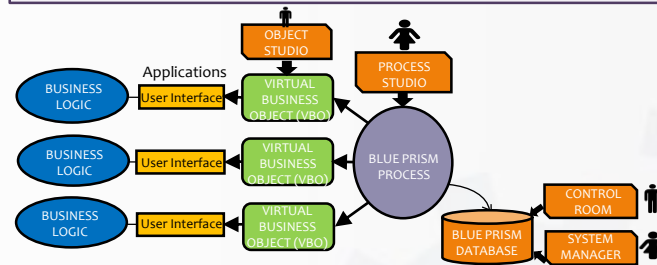
Process: Sequence of steps which is used to perform a particular task

Automation: Any process which is done by robot without any human intervention and provides high degree of accuracy

VENDOR	Free Version	Pricing	Usability	Global Coverage
Another Monday	----	----	----	Europe
AntWorks	----	----	----	----
Arago	----	----	----	----
Automation Anywhere	----	Per Process	Drag & Drop, Macro Recording	Global
BluePrism	----	Per bot	Drag & Drop	----
Contextor	----	----	----	EMEA & North America
Jidoka	----	----	----	----
Kofax	----	----	----	Global
Kryon Systems	----	----	----	----
Nice systems	----	----	----	Global
Pega	----	----	----	Global
Redwood software	----	----	----	----
UiPath	UiPath Community Edition	Per bot	Drag & Drop, Macro Recording	Global
Visual Cron	45 day free trial	Per server	Drag & Drop	----
WorkFusion	WorkFusion RPA Express	Per process	Drag & Drop, Macro Recording	Global

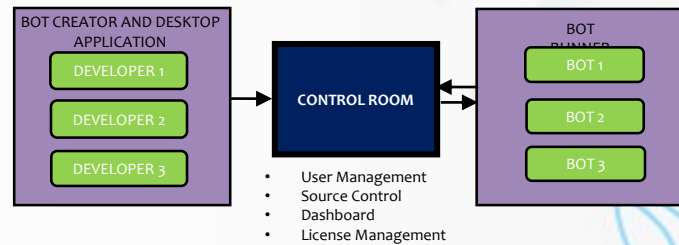
Blue Prism

It is built with a simple concept by replicating user activity. **SQL Server** is the tool where data is stored



Automation Anywhere

The architecture consists of **client**, **bots** and **control room**. Automation Anywhere is a software designed to virtually automate any computer process. **SQL express** is a tool where data is stored.

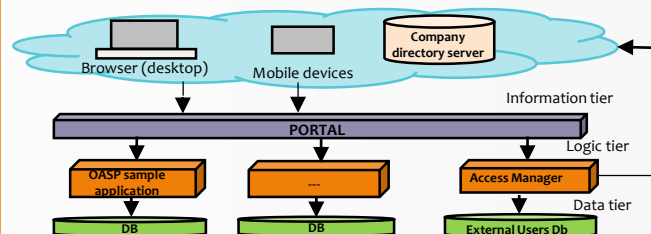


Ui Path

It is a simple software automation and application integration expert.

UiPath consists of three parts

- **UiPath** studio
- **UiPath** robots
- **UiPath** orchestrator

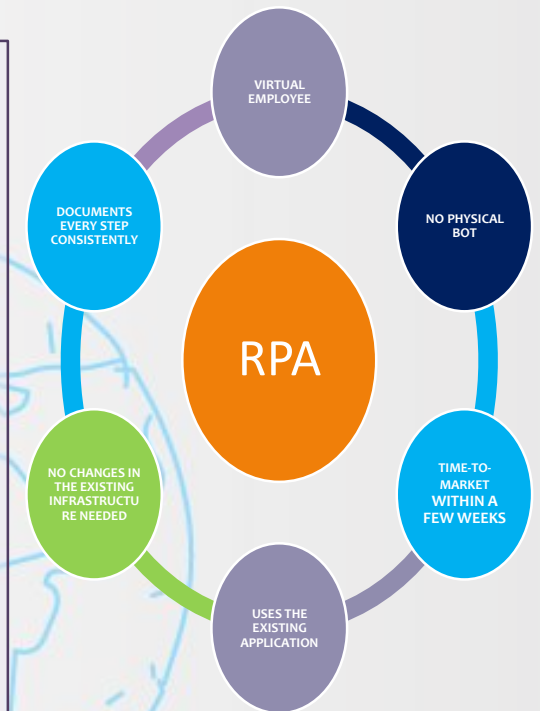


RPA Tool Factors

- **Technology:** Many organizations perform the tasks outside the local system using Virtual Machines or Citrix. Hence, the tool must be platform independent and support any type of application
- **Scalability:** How quickly and easily the tool responds to the business requirements
- **Security:** Implementations of security controls must be measured
- **Total Cost:** The initial set-up cost, vendor license fee, maintenance cost must be taken into consideration while selecting the tool
- **Ease of use and control:** The tool must be user friendly to increase the efficiency and employee satisfaction
- **Vendor Experience:** It improves the speed of implementation by reducing the work required to implement RPA software
- **Maintenance and support:** To make sure that the required service level agreements are met
- **Quick Deployment:** The tool must be able to work as a real end-user by interacting with applications.

Benefits of Using RPA

- **Reduces burden on IT:** It does not disturb underlying legacy systems
- **Reliability:** As the bots can work 24*7 effectively
- **Cost cutting technology:** It reduces the costs by reducing the size of manual workforce
- **No coding required:** To use RPA tools, a person need not have the programming skills
- **Accuracy:** It functions with accuracy and is less prone to errors
- **Productivity rate:** Execution time is much faster than the manual process approach
- **Compliance:** It follows the rules to provide audit free trail
- **Consistency:** Repetitive tasks are performed in the same way
- **Increase employee engagement:** It lets the employee to focus on value-added activities



Applications of RPA

- It is used in customer service, to automate service order management and quality reporting
- **Travel and logistics:** for ticket booking, passenger details and accounting
- **Human Resource:** New employees joining formalities, payroll process and hiring shortlisted candidates
- **Health care:** In patient registrations and billing
- **Banking and Financial services:** It can be used for card activation and fraud claims and discovery
- **Government:** Change of address and license renewal



FURTHERMORE:
RPA Training using UiPath



Internet of Things

The Internet of Things (IoT) refers to a system of interrelated, internet-connected objects that can collect and transfer data over a wireless network without human intervention. IoT devices are basically "smart" devices that make "smart" systems (for e.g., smart home, smart factory, smart farms, smart cities, etc.).

Overview	Challenge	Solution	Results
If machines could talk – and tell you when they were going to break down.	When a machine is not functioning properly, productivity drops. How can you tell, quickly, that something is wrong?	IoT sensors on agricultural machinery were connected to the cloud. Managers & workers received immediate notifications when the machine was not functioning properly.	This also resulted in predictive data analysis from the information provided. Engineers started to build a picture and predict when the machine would break and plan maintenance. This increased productivity to 100%.
Remote Monitoring – Improving work performance.	Staff shortages for a civil engineering company reduced the number of onsite visits that could be carried out.	Rather than manually taking readings and producing reports, data was collected on IoT sensors, uploaded to the cloud and this generated a report.	Improved efficiencies, enabling the company to take on more projects and increase their customer base.
Blinding the competition – how to get a USP with IoT.	Consumers want smarter, simpler everyday devices.	Blinds that are IoT enabled – features include a camera, thermometer, lighting and sensors, allowing for seamless integration into the home environment.	"Work still on-going on IoT products at Bloc Blinds as it is an exciting space with loads of potential!" <u>Read how Magherafelt's Bloc Blinds has incorporated IoT technologies</u>