Digital Disruption and Strategies for Digital Transformation

Digital Platforms

DIGITAL BUSINESS

Learning Objectives

Digital platforms play an important role in making an organization's digital transformation journey successful.

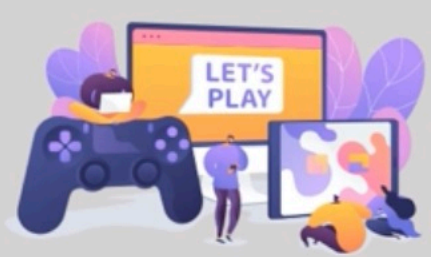
Digital Platform

Digital environment that allows users to communicate, collaborate, and share

Digital Platform

Platform serves in these categories:

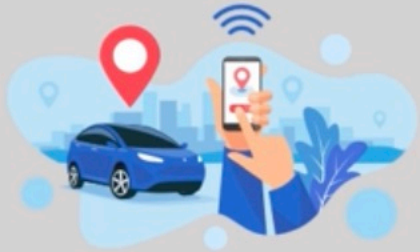
Videos



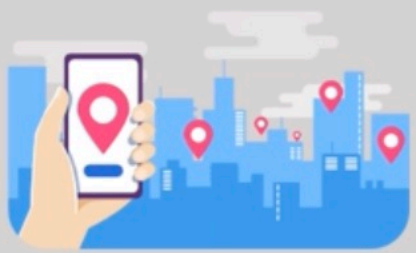
Gaming

Auctions

E-Commerce



Car Ride

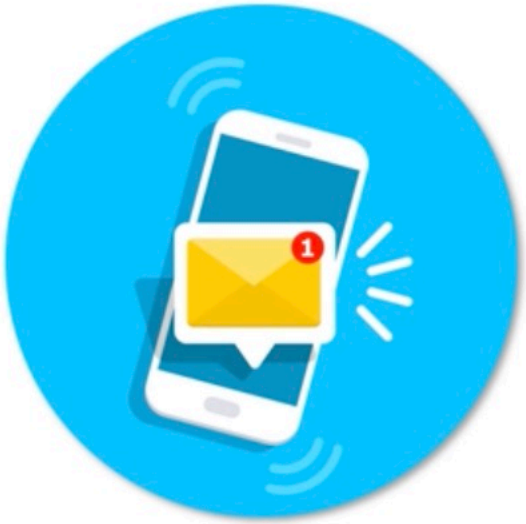


Home Rentals

B2B Businesses

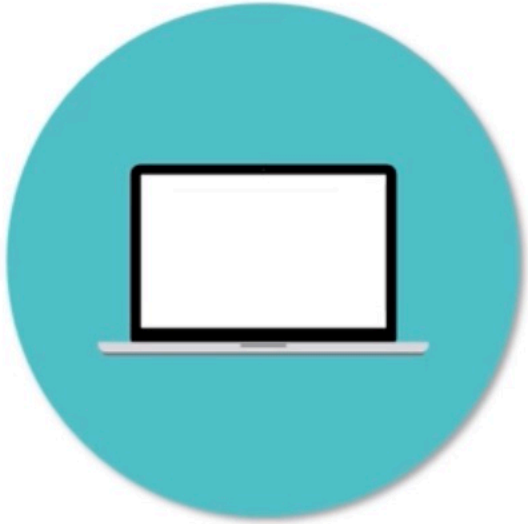
Digital Platform

Digital platform is software that runs on the web and can be accessed from anywhere.



Smartphones

Tablets

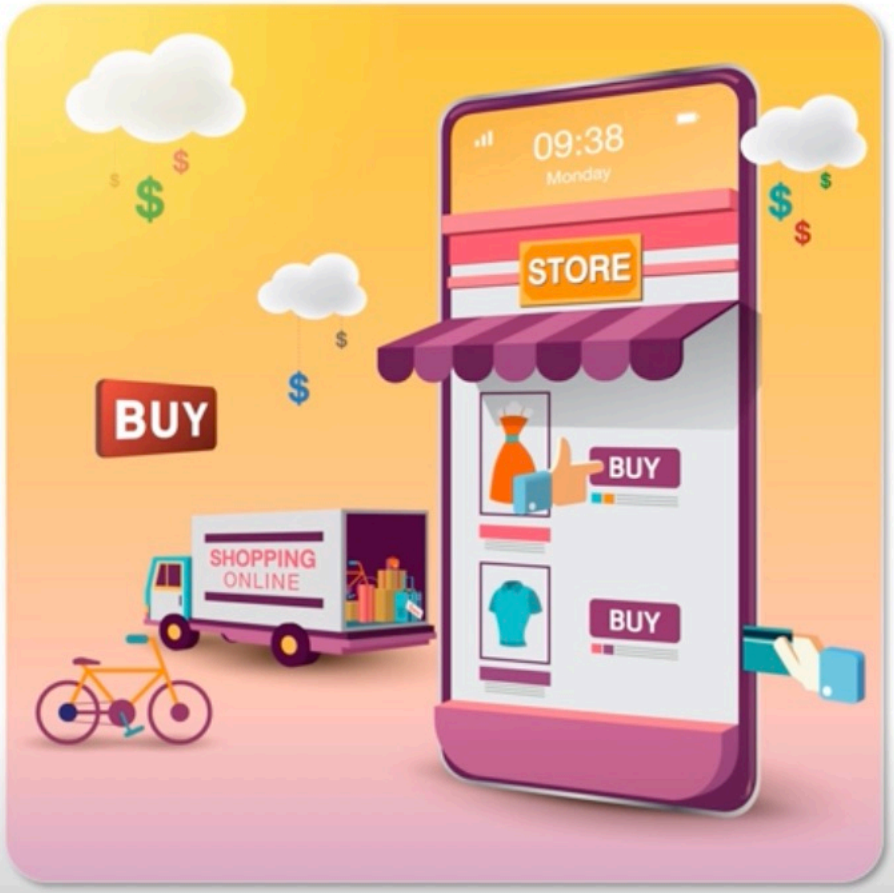


Laptops

Digital Platform

Digital Platform

Digital platform attracts customers with its services.



Examples of Digital Platforms

Provides rental accommodation for visitors in a locality

Examples of Digital Platforms

Provides road transportation services for commuters from one point to another in cities

Digital Platforms: Aggregator

DIGITAL BUSINESS

Types of Digital Platforms

There are four types of digital platforms:

Aggregators

Social

Types of Digital Platforms

Mobilization → KICKSTARTER, Crowdfunder

Learning → coursera, Khan Academy

Types of Digital Platforms

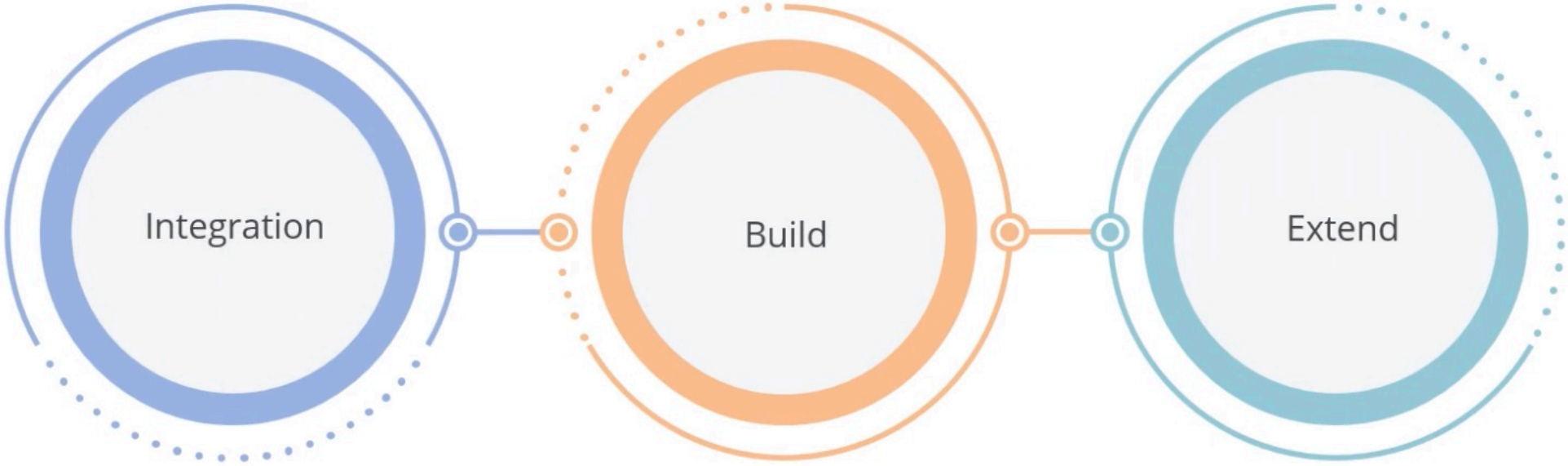
Mobilization → KICKSTARTER, Crowdfunder

Learning → coursera, Khan Academy

Industries have derived great value from digital transformation.

Aggregators

Aggregators are organizations that bring similar products or services from different organizations into a single platform by streaming and rebranding them as their own services.



Model 1: Integration

Integration

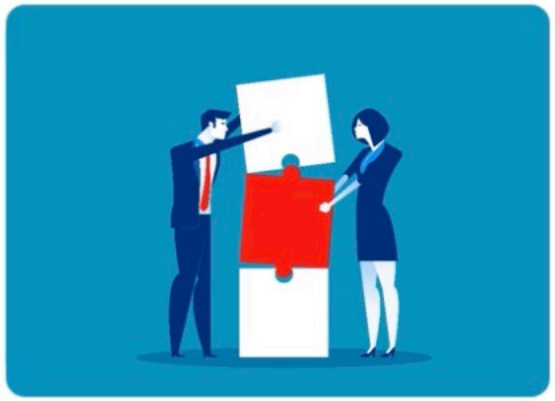
- Aggregators consolidate the existing offerings of multiple organizations into a single platform without changing the brand name.
- Typically, there is no value addition by an aggregator to the service.

Model 1: Integration

- Example: eBay is a marketplace that brings products and services from different organizations without changing the brand.
- The business model charges margin on top of the product.

Integration

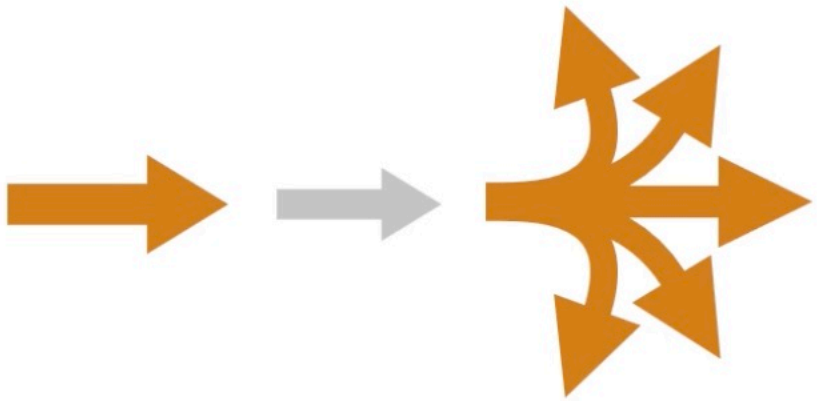
Model 2: Build



Build

Aggregator creates a new product or service under its own brand via consolidation of services right from the end supplier.

Model 3: Extend



Aggregators extend their already consolidated service to new channels.

Extend

Model 3: Extend

- Example: Google Ads. Google has created an ad inventory from different organizations and then extended it to different blogging websites.
- Bloggers that generate website traffic can choose Google Ads for their portals, and Google uses APIs to show ads that are consolidated.

Extend

Digital Platforms: Social, Mobilization, and Learning

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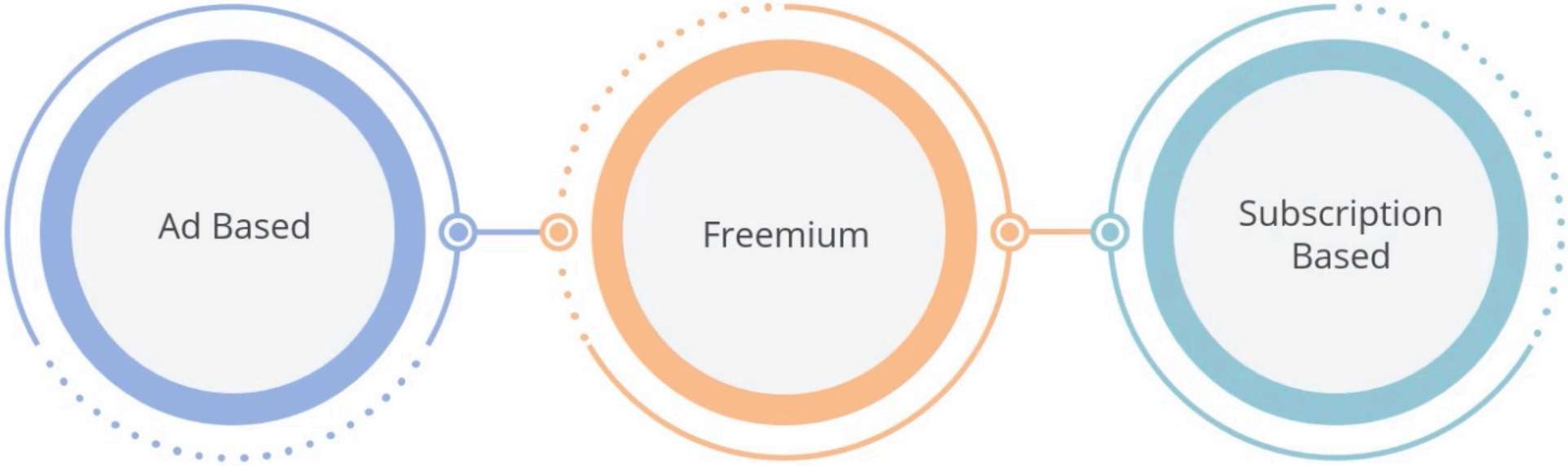
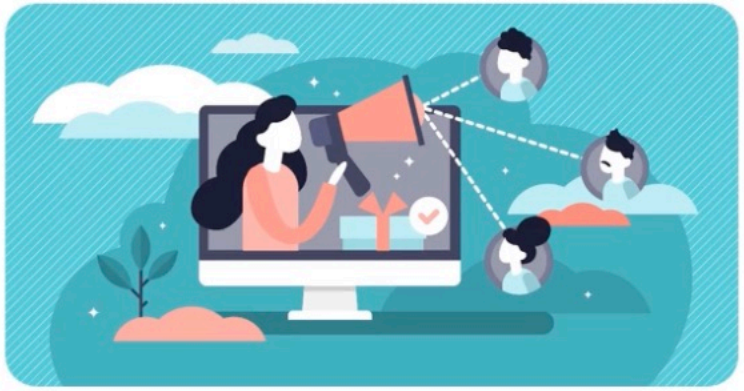
Social Platforms

Platforms that bring people and community with similar interests into a single stream are called social platforms.



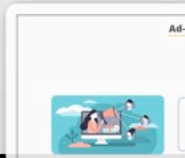
Ad-Based Model



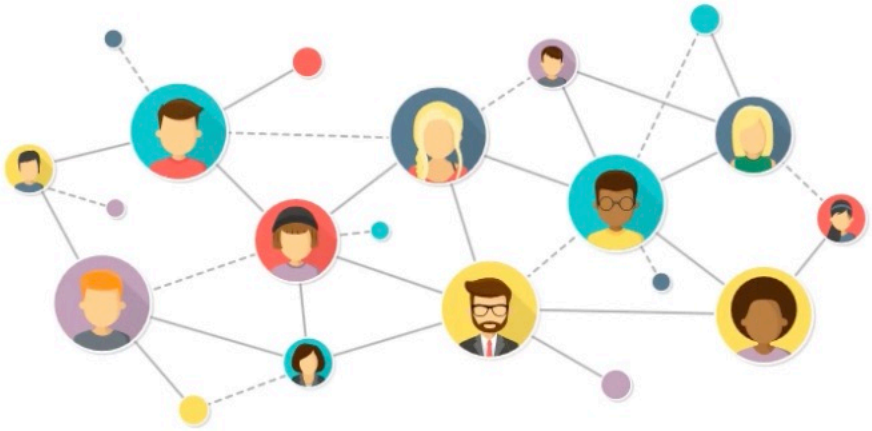
In this model, the platform brings people with similar interests together, and once enough traffic is created, the platform uses ads to generate money.

Ad-Based Model

Example: Stack Overflow has brought people with coding interest together.



Freemium Model



In this model, the platform connects two or more people in which basic services are free, but some services require upgrading to a paid version.

Freemium Model

Example: LinkedIn allows you to connect with people for free but provides additional features to paid users.

Subscription-Based Model

In this model, only subscribed users who paid a certain amount can connect to each other.

Subscription-Based Model

Example: VYCEZ is a subscription-based social media app.

Mobilization Platforms

These platforms mobilize a specific set of groups to solve a particular problem.

The business model of a mobilization platform is to integrate the common goals of people into a single platform.

In this model, the collective mind of people is a great tool.

Examples of Digital Platforms

If someone has a revolutionary product idea but doesn't have the investment for it, they can use Kickstarter to ask people to work toward its development by contributing money toward it.

KICKSTARTER

Examples of Digital Platforms

This kind of platform mobilizes the common interest of people to achieve a certain objective.

Examples of Digital Platforms

This kind of platform mobilizes the common interest of people to achieve a certain objective.

Learning Platforms

Learning platforms are one of the recent evolutions of platforms where technology is expanding dramatically in the education world.

Examples of Learning Platforms

Organizations that have adopted learning platforms:

It is an American nonprofit organization which provides access to K-12 or higher secondary curriculum for free to the entire world.

- It is a massive open online course provider that has transformed the way people learn.
- Its ability to provide content across multiple channels, from websites to apps, gives users the flexibility to learn things at their own pace and through their channel of choice.

Digital Disruption and Strategies for Digital Transformation

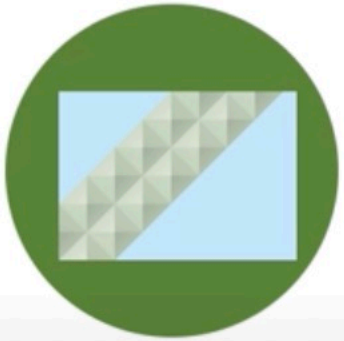
Customer Networks

DIGITAL BUSINESS

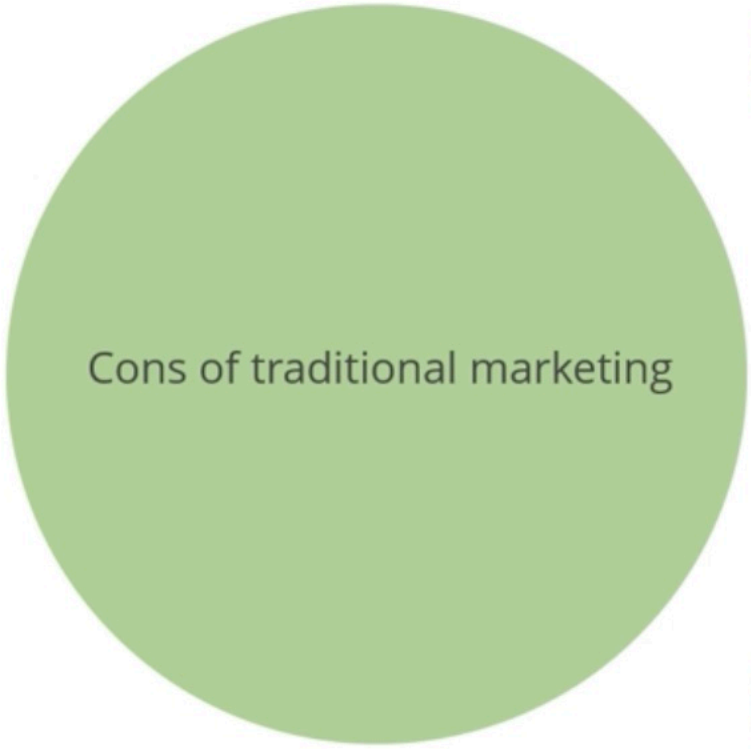
Traditional Ways of Marketing and Communication

Generate sales and make profits

Traditional Ways of Marketing and Communication



Traditional Ways of Marketing and Communication



Unidirectional way of communication

No customer feedback

No improvisation in product innovation

Adapted Ways of Marketing and Communication

With the development of social media

Bidirectional communication became possible

Adapted Ways of Marketing and Communication

Understanding Customer Networks

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Marketing Funnel

Marketing funnel helps to understand the importance and impact of modern-day customer networks on businesses.

Marketing Funnel: Awareness

Awareness:

Product introduction

Advertisements, promotions, and word of mouth

Traditional marketing was time-consuming and expensive

Social media

Marketing Funnel: Consideration

Checking product reviews, feedbacks, and ratings

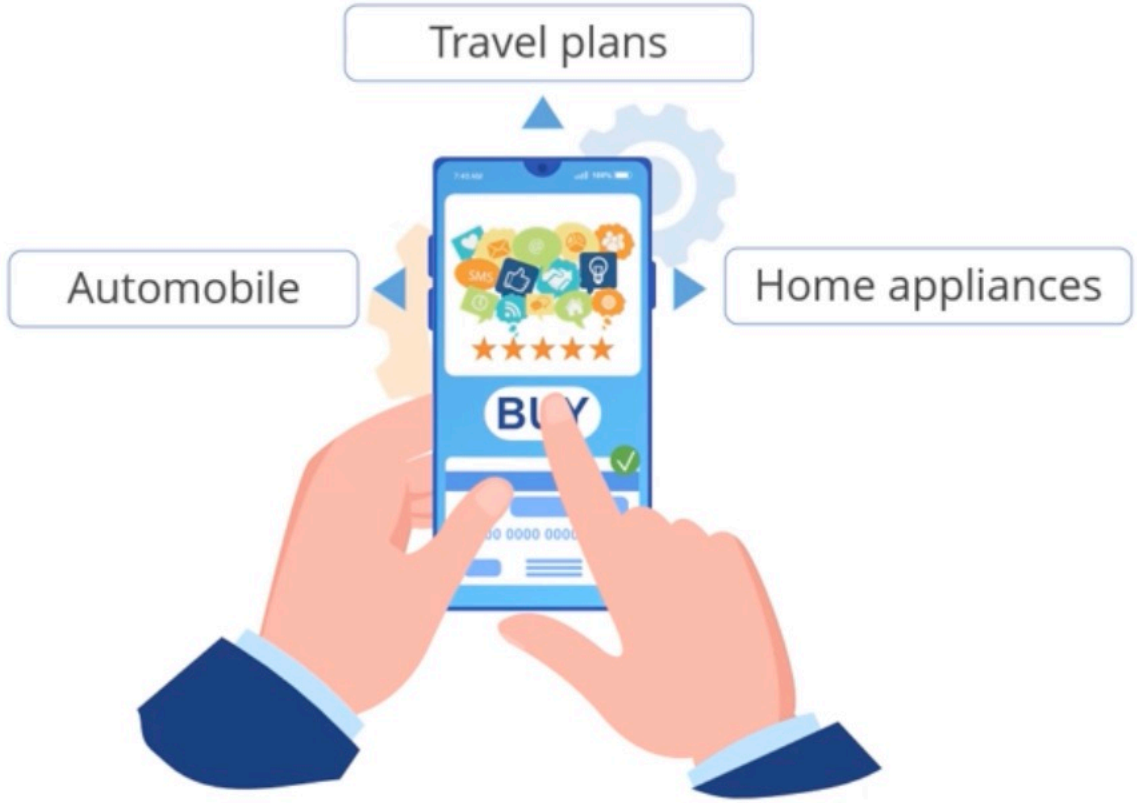
Getting introduced to new products through different channels

Making sure that the product is meeting customers' needs

Consideration

Marketing Funnel: Preference

Customers research in detail for the products on social media and check the ratings and recommendations.



Marketing Funnel: Action

Buying the products from the store

Buying products online from e-commerce sites

Using digital delivery for online content

The product purchasing medium has changed with the availability of new digital channels.

Marketing Funnel: Loyalty

Companies have brought in concepts of loyalty points and rewards to retain customers.

Walmart rewards can be used to make payments and get 2% cashbacks for every $100 purchase.

Marketing Funnel: Advocacy

Loyal customers are ambassadors for the product

Provide feedback, reviews, and ratings on e-commerce sites

Upload photos and videos on social networking sites

Marketing Funnel: Powerful Way of Communication

Disrupting traditional businesses

How Do Customer Networks Add Value to the Business?

DIGITAL BUSINESS

Customer Networks as Digital Disruptor

Traditional ways cannot help a business grow in this digital age

Any new start-up can disrupt a company not paying heed to customer feedback

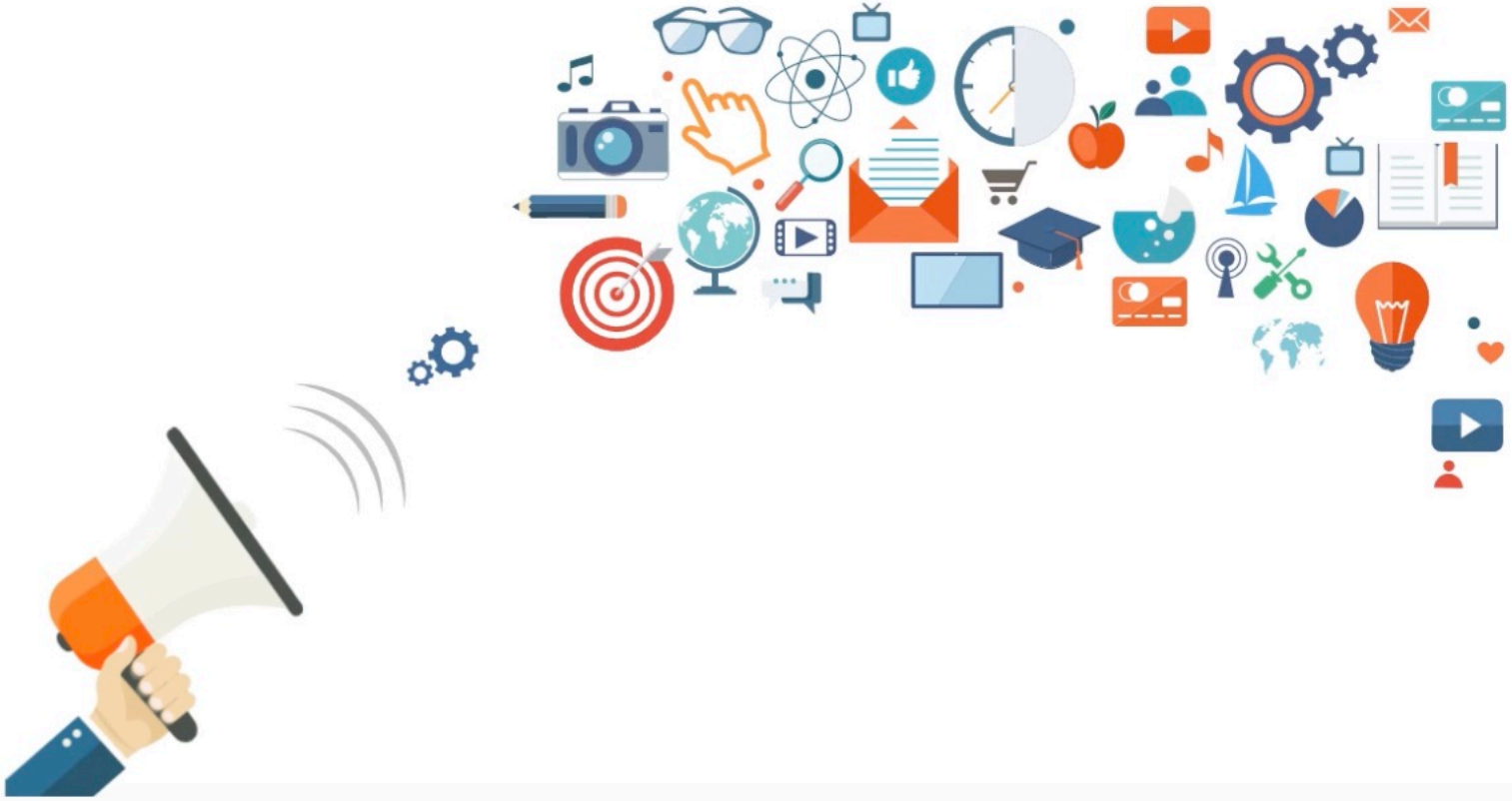
Consumers use social media to provide feedback

Customer Networks as Digital Disruptor

Customers do some research and use different channels before deciding to buy a product

Customer participation and engagement in a network enhances product value

Ways of Marketing Using Customer Networks



Social Media

Helps to reduce the failure rate of product acceptance

- Access social media platforms to create pages
- Post information of new products and collect feedback
- Change the product incorporating the initial feedback

Partnership with Start-Ups

Collaborate with the customer network

Access customer networks

Tie-up with start-ups

Follow the existing business model

Adaptive Approach

Culture Adaptation

Replace the traditional way with customer networks

Adapt new methods to survive in the market

Change the culture in the organization

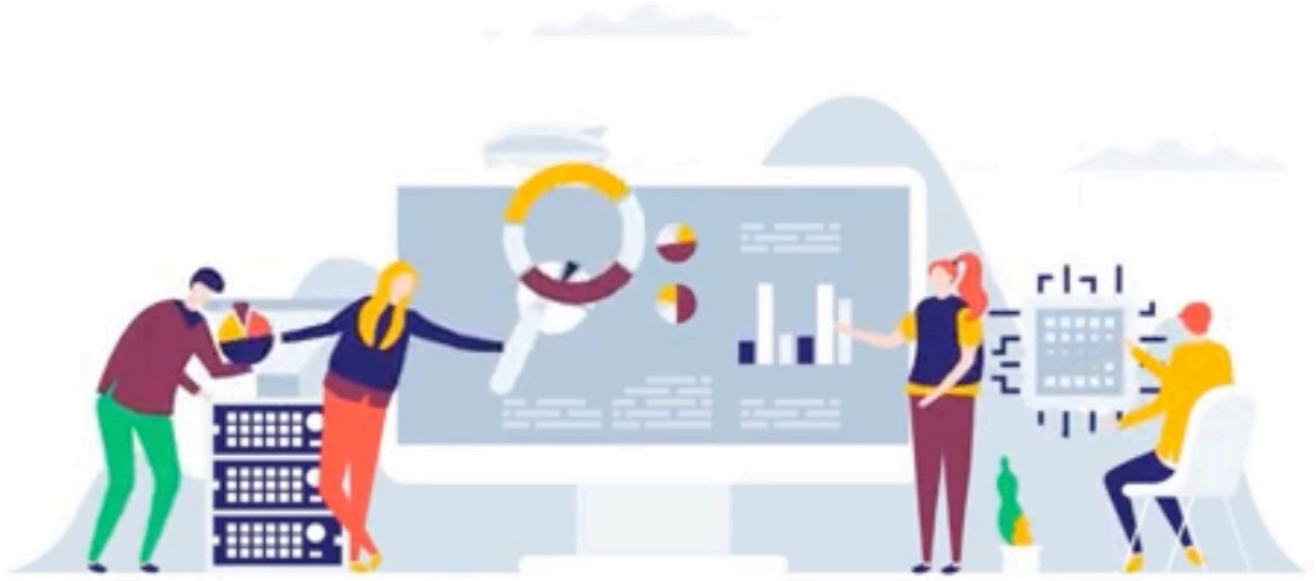
Digital Disruption and Strategies for Digital Transformation

Big Data

DIGITAL BUSINESS

Learning Objectives

Data analysis helps business derive insights from customer's buying patterns.



Big Data

Analysis, extraction, and visualization of key insights from large sets of available data

Characteristics

Velocity

Volume

Variety

Deriving Insights

Gather relevant data from various data sources.

Database

Social Media

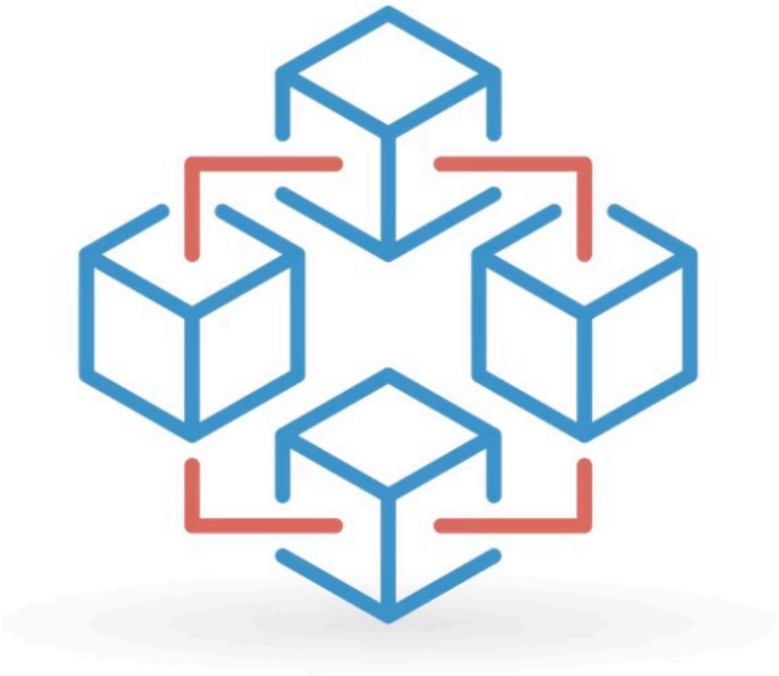
Structured/
Unstructured Data

Deriving Insights

Define the attributes of the data.

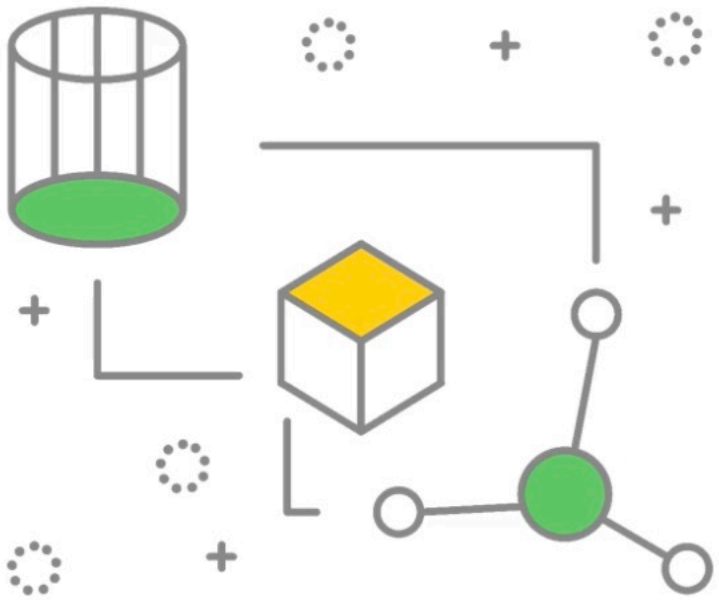
Attributes

Deriving Insights



Extract data to develop a structure that fits into your mathematical model or algorithm.

Deriving Insights



Apply different algorithms, and select the model that’s accurate for the target output.

Deriving Insights

Present the results in visual forms like charts, graphs, or images.

Volume

The quantity of data available to make insights and predict outcomes

Volume

Big Data is larger than terabytes and petabytes.

Volume

The quantity of data available to make insights and predict outcomes

Volume

The higher the quantity of data, the greater the possibility of deriving outcomes and creating new value propositions.

Variety

The type and nature of data

Variety

Type refers to structured or unstructured data.

Structured vs. Unstructured Data

Structured Data

- Present in clearly defined formats like Excel files
- Manipulated per business requirements to analyze and derive insights
- Easily analyzed

Unstructured Data

- Present in images, social media chats, messengers, and audio/video files
- Data processing is difficult and time-consuming
- Advanced tools required to analyze and structure the data

Velocity

Speed at which the data is generated and processed in real time to decipher insights from it

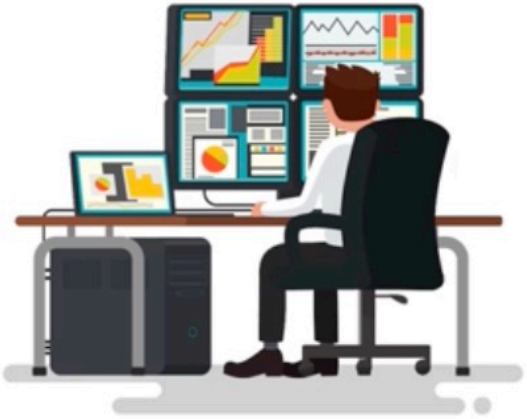
Velocity

As data keeps changing depending on the content required, processing data to get relevant insights is a challenge.

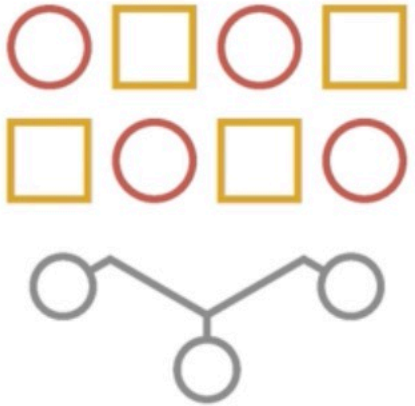
Big Data: Challenge

How do you gather insights from huge volumes of data in different forms in real time?

Overcoming the Challenge



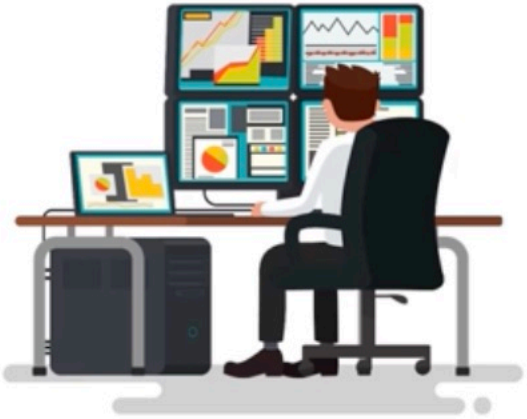
Data analyst



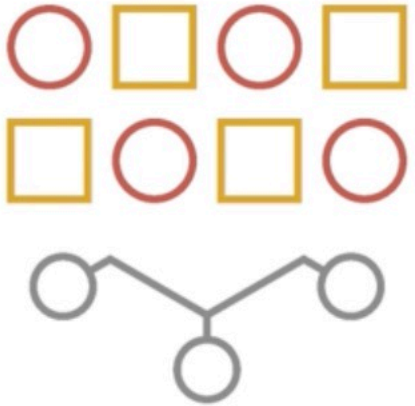
Sampling

Study randomly picked, small chunks of data

Overcoming the Challenge



Data analyst



Sampling

Analyze them based on the business requirements

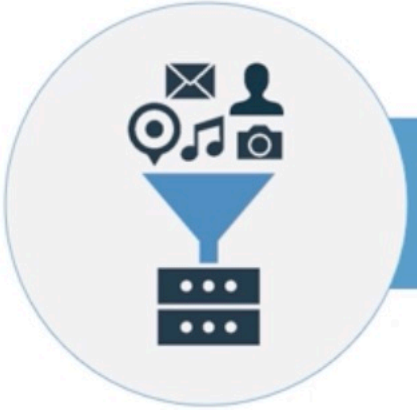
Big Data Analysis: Example

Analyze Big Data to meet a business requirement

BCD Naturals

Big Data Analysis: Example

Conduct research surveys through social media platforms



Conduct polls, gather opinions, and collate the data from various sources

Big Data Analysis: Example

Clean the data

Sentiment analysis

Perform sentimental analysis to understand user reactions

Big Data Analysis: Example

Determine customer sentiments based on the sentiment analysis.

Positive/Negative Sentiments

Components of Big Data Solution

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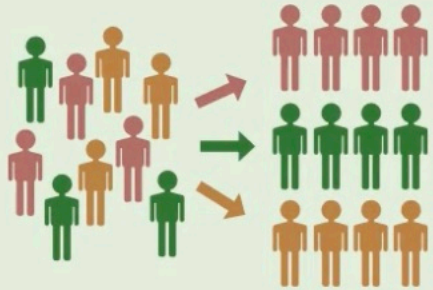
Big Data Solution

Big Data Solution allows usage of data from multiple sources.

Big Data Solution

Big Data for customer data

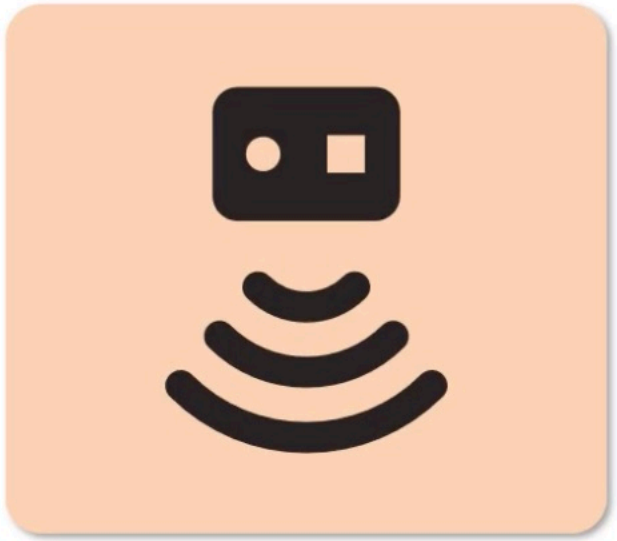


Customer Segmentation

Sources

Component from which data is consolidated

Internal Customer Relationship Management (CRM) Systems



IoT Sensors

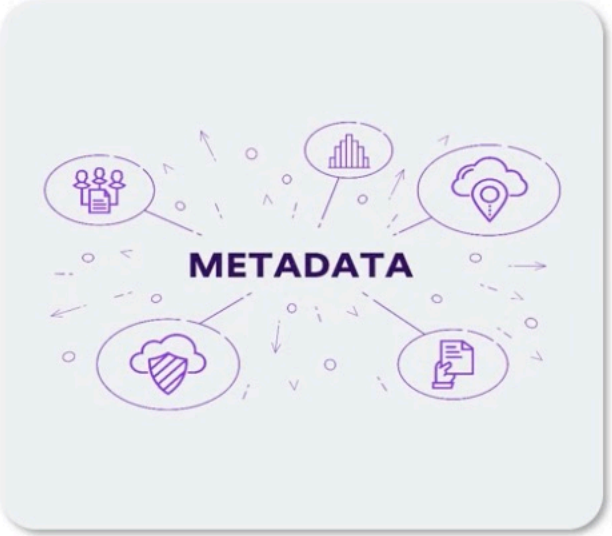
Social Media Comments

Ingestion Layer

Provides the capability to:

Clean data

Encrypt data



Create new metadata

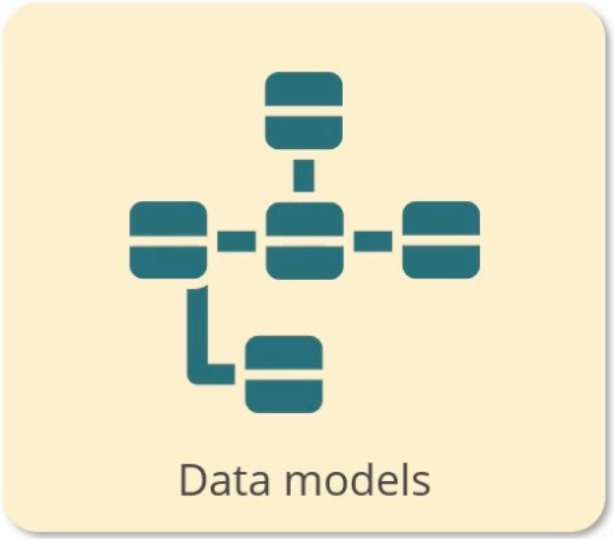
Data Preparation

Process of validating data that involves making corrections to the data

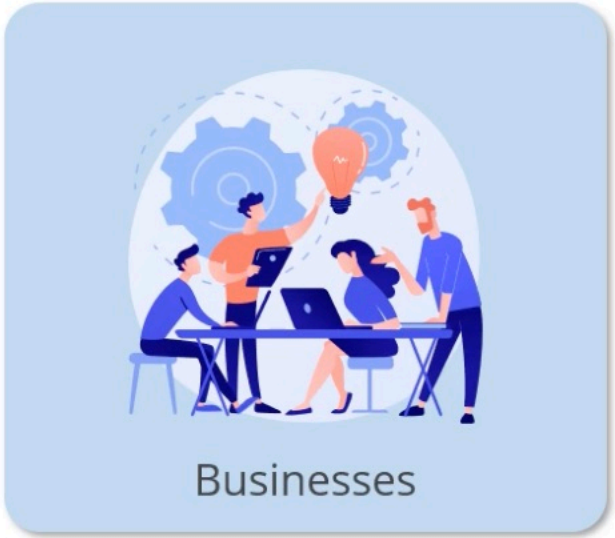
Example: Validating the data on consumer addresses

Data Modeling

The focus is on building different data models that businesses can use.



Data models

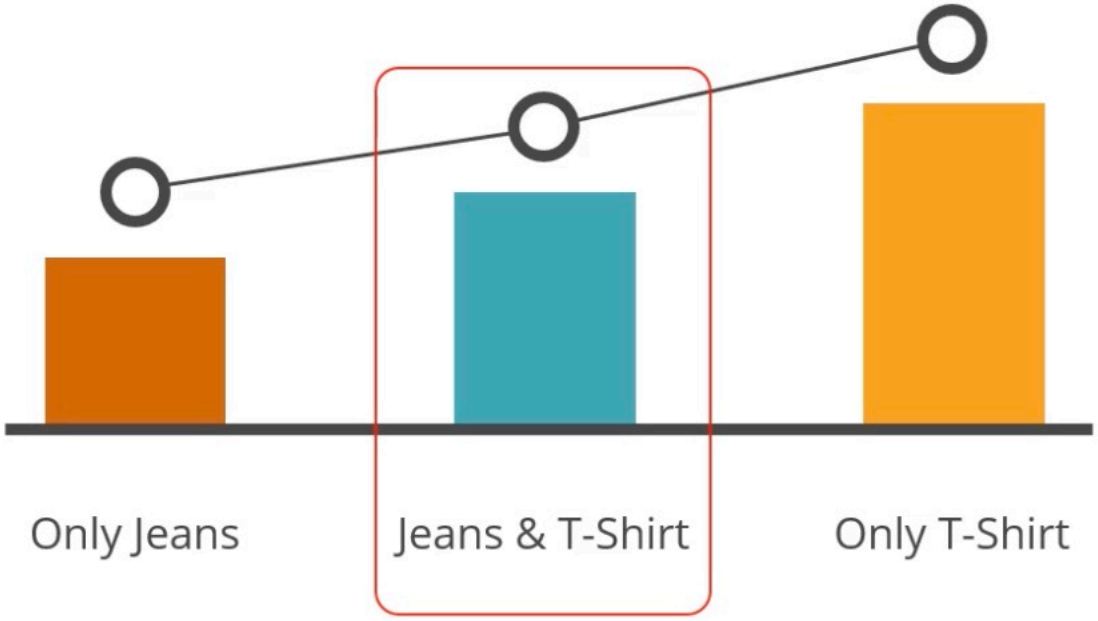


Businesses

Example: Creating a recommendation model, which provides customers with relevant information

Visualization

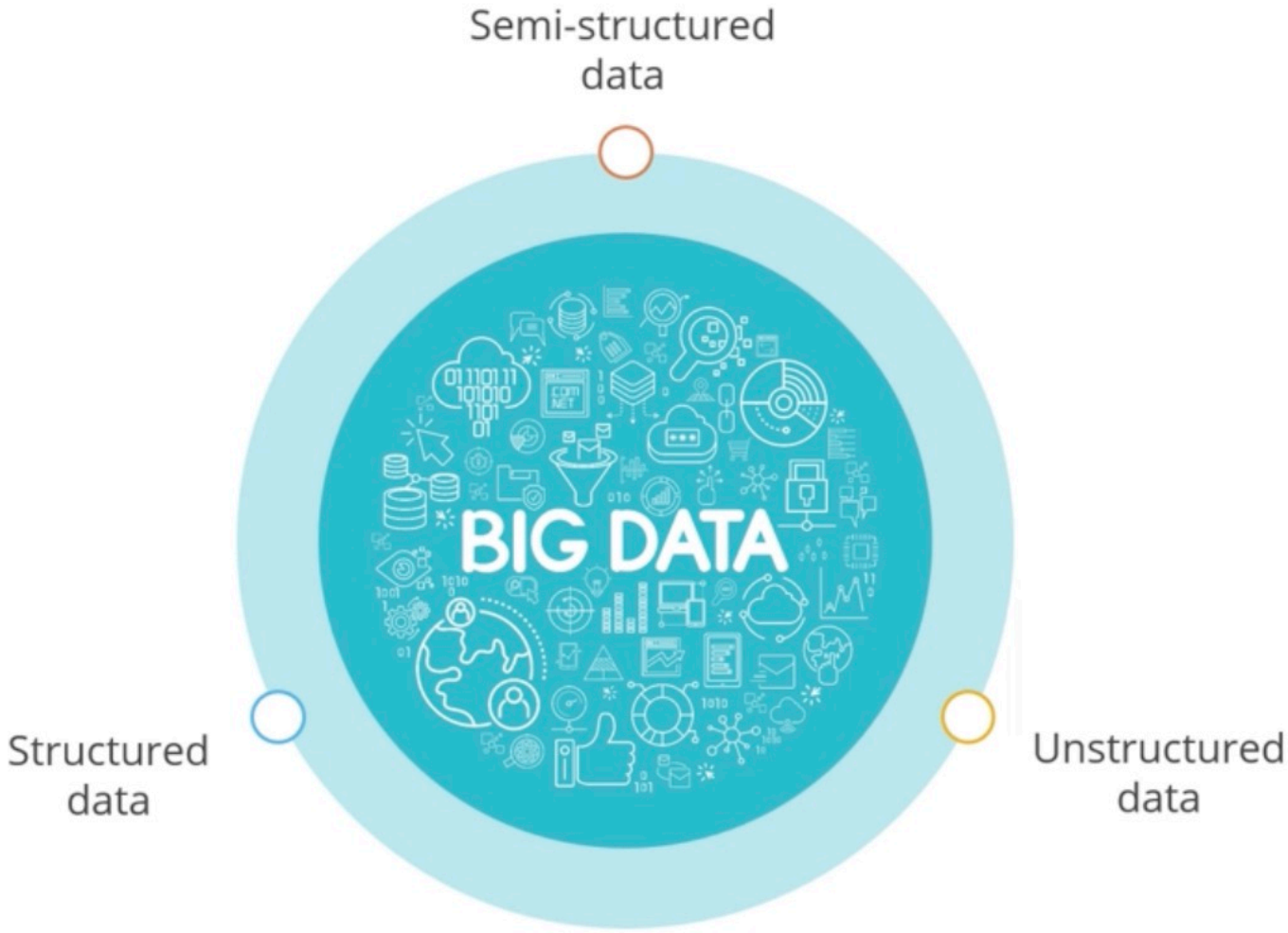
Visualization in different forms like graphs or charts helps businesses understand specific use cases.



Big Data: Impact on Digital Transformation

DIGITAL BUSINESS

Impact on Transformation



Impact on Transformation

Different technologies integrate to generate large sets of data.

IoT Devices

Wearables

Smartphones

Cloud

Impact on Transformation

More the data, greater the capability to analyze customer behavior and find target customer segments.

Impact on Transformation

Big Data helps your organization in cost savings.

Predictive Analytics

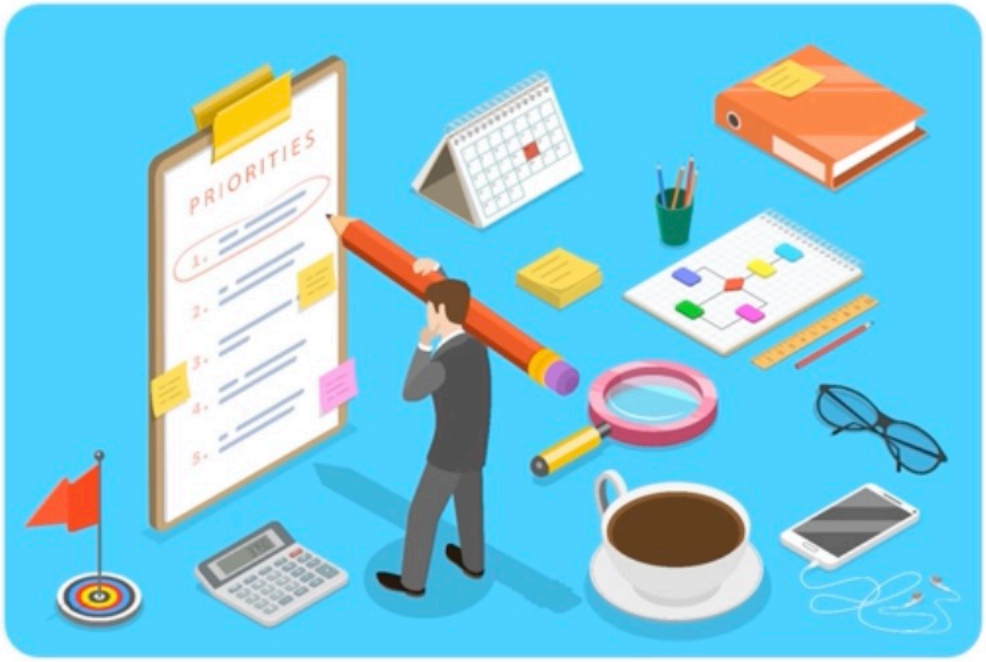
Operational Efficiency

Impact on Transformation

Insights from Big Data enable you:

- Form new business models and product lines
- Achieve high revenues

Impact on Transformation



Big Data helps you identify the aspect of transformation to prioritize.

Impact on Transformation

Big Data enables companies to analyze and enhance their processes. This results in improved sales and logistics.

Impact on Transformation

Single master system where all the data or information is available

Don’t have to search in disparate files

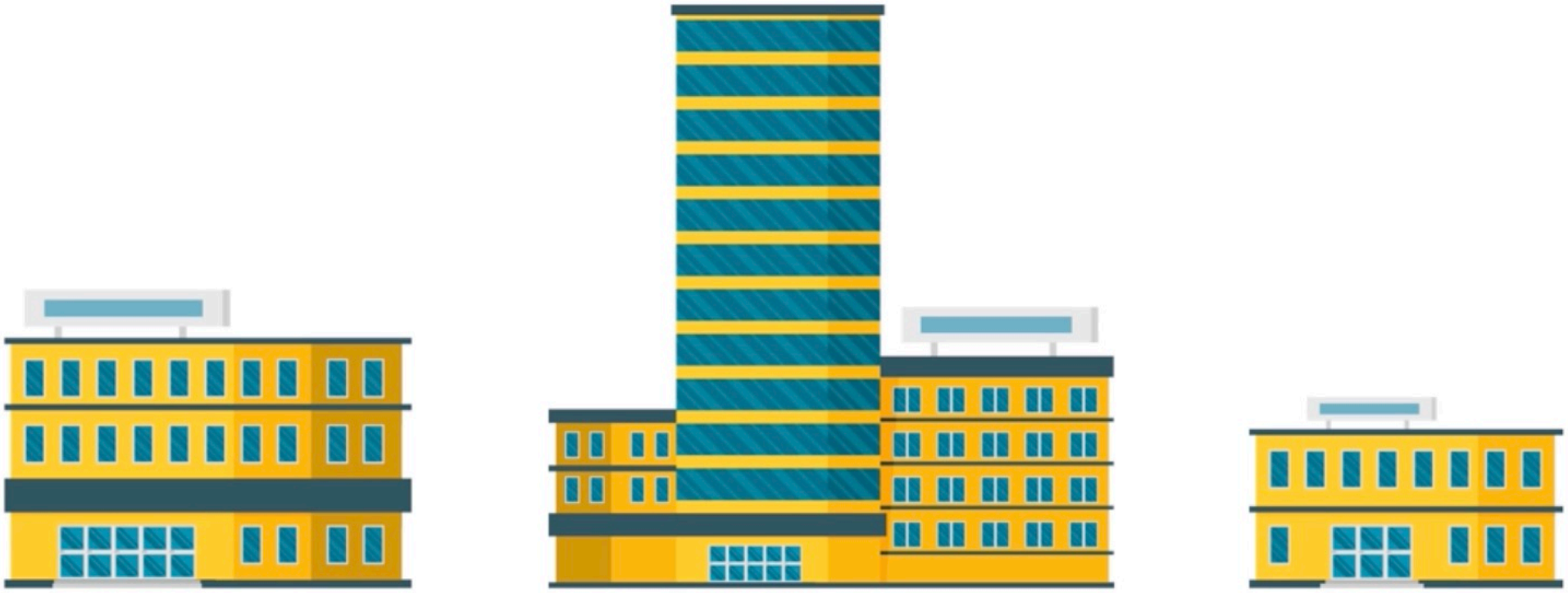
Impact on Transformation

Enable storing and analyzing of huge volumes of data at low costs

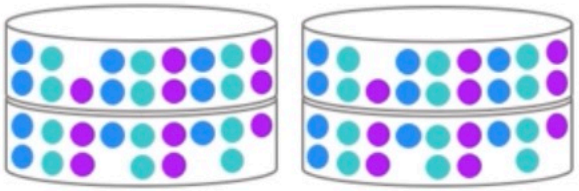
Impact on Transformation

Facilitate better and faster decision-making

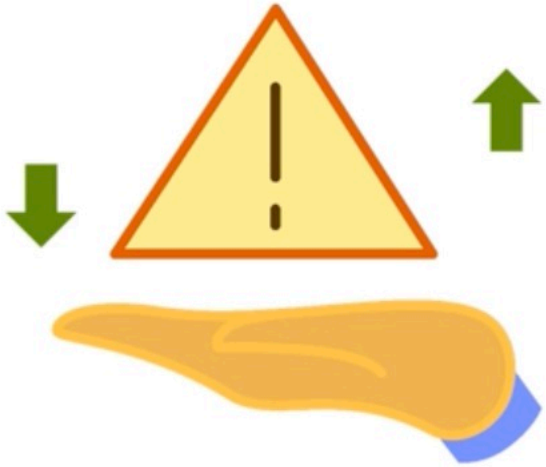
Impact on Transformation



Big Data Benefits: Banks



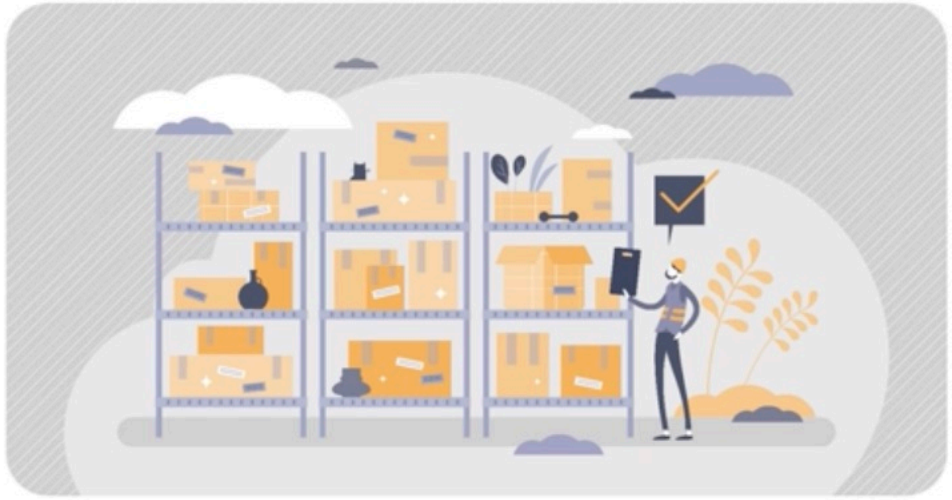
Eliminate redundant databases



Analyze risks

Monitor financial transactions for fraud detection

Big Data Benefits: Retailers



Analyze inventory data to prevent stockout situation

Analyze demand patterns

Big Data Benefits: Retailers

Improve customer experience

Increase profits

Big Data Benefits: Manufacturers

Save labor and material costs

Analyze the historical data
and derive insights

Big Data Benefits: Manufacturers

Optimize and streamline processes

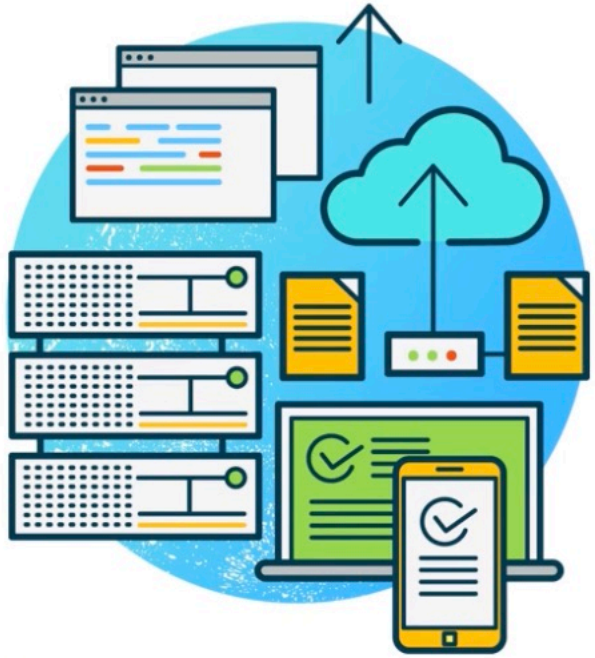
Improve efficiency of operations

Big Data Platforms

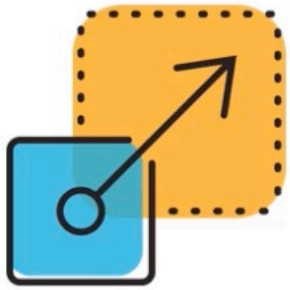
DIGITAL BUSINESS

Big Data Platforms

Help you process voluminous data to gather insights for your business and improve its performance



Big Data Platforms



Improve business scalability

Enhance data security

Big Data Platforms: Benefits

Data Engineers

- Extract, clean, and visualize data
- Build data models

Big Data Platforms: Benefits

Query and search information

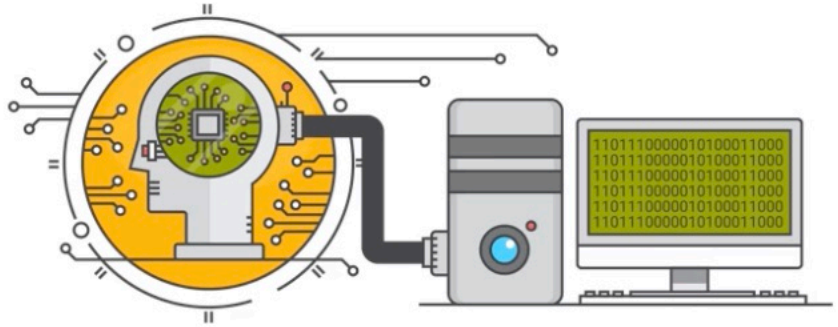
Business Users

Gather insights for better decision-making

Big Data Platforms: Benefits

Analyze patterns from large data sets

Data Scientists



Machine Learning Algorithms

Big Data Platforms: Azure

Microsoft Azure

Data Analysis

Streamlining of data clusters

- Integration of other Azure tools

Big Data Platforms: AWS

Amazon Web Services (AWS) has various data analytics tools.

Data Warehousing

SQL Querying

Data Preparation and Extraction

Big Data Platforms: AWS

Customizable Encryption

Virtual Private Cloud

Big Data Platforms: Cloudera

It processes huge columns of data in warehouses.

Cloudera DataFlow (CDF) helps prioritize and analyze real-time data.

Big Data Platforms: Google Cloud

BigQuery searches warehouses to retrieve data in easy-to-read formats.

Data Management Tools

Google Data Studio helps visualize the analyzed data in graphical forms.

Big Data Platforms: Tableau

Users can analyze trends, correlations, and interdependencies among data sets in the Tableau platform.

Big Data Platforms: Tableau

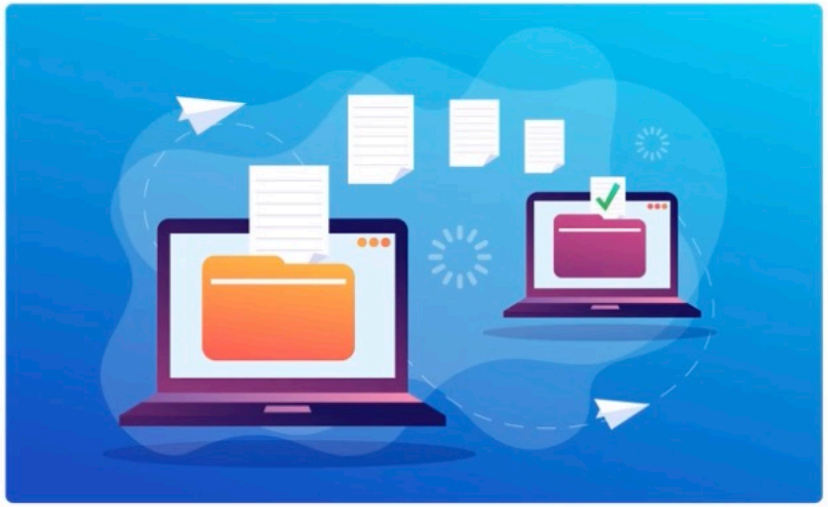
Catalog data at a granular level

Data Management
Add-on Tool

Track the history of data

Big Data Platforms: Oracle

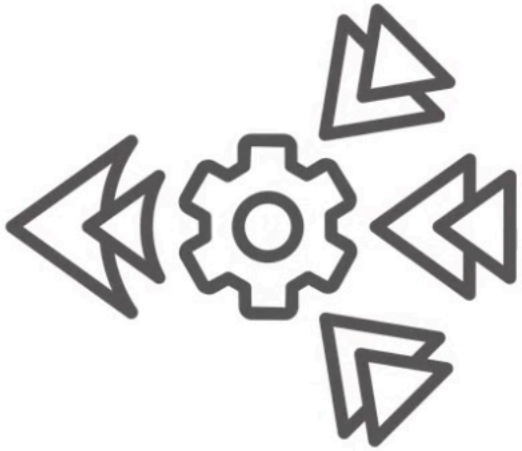
ORACLE®



Data can be transferred in different formats onto the cloud servers without downtime.

Big Data Platforms: Oracle

ORACLE®

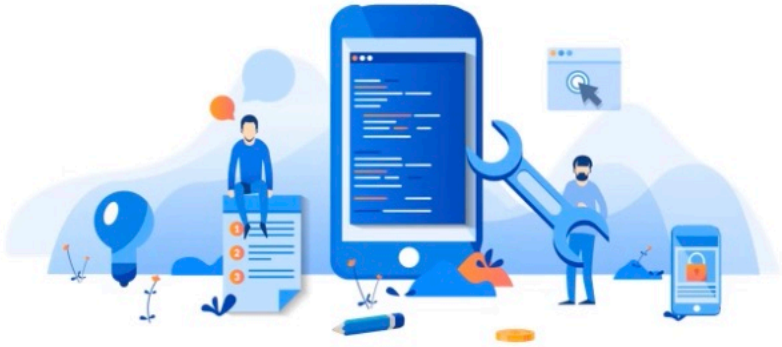


Basic and governance editions are available to transform data.

Big Data Platforms: MongoDB

- Stores data as JSON documents
  - Digital objects arranged in different ways

Big Data Platforms: MongoDB



App Developers

Search Functionality

Users can search for graphs, text phrases, or geotags in the data.

Big Data: Use Cases

DIGITAL BUSINESS

Big Data: Use Cases

Organizations make their mark in the industry based on their Big Data solutions.

Big Data Solution

Big Data: Use Cases

NETFLIX

Uses Big Data to optimize processes that range from creation of content to its recommendation

Big Data: Use Cases

Inventory Optimization

Big Data: Use Cases

Uses Big Data to create the pricing plan

Uber

Big Data: Use Cases

Surge Pricing

Factors like time, location, and the number of cab bookings

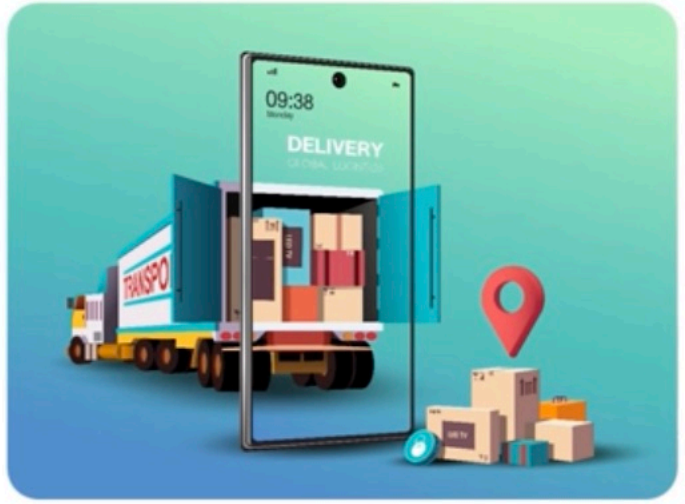
Big Data: Use Cases

Uses Big Data to promote a specific product

Big Data: Use Cases

Big Data is used to optimize its supply chain.

Inventory Storage



Delivery

Big Data: Use Cases

Utilizes Big Data to procure content based on the type of content users stream on its platform

Big Data: Use Cases

Utilizes Big Data to procure content based on the type of content users stream on its platform

Digital Disruption and Strategies for Digital Transformation

Artificial Intelligence

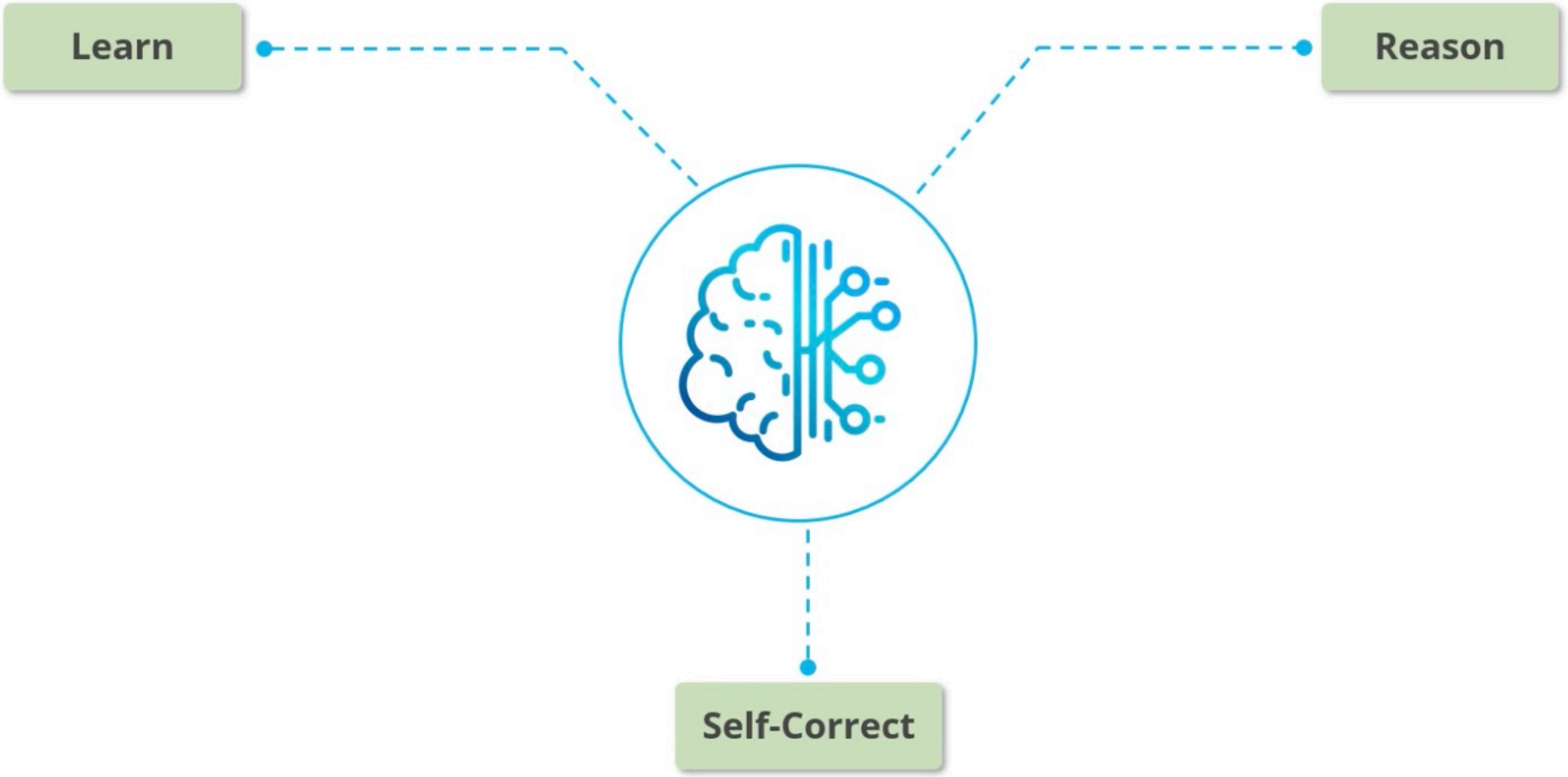
DIGITAL BUSINESS

What Is AI?

Artificial intelligence (AI) is an attempt at simulating human intelligence in machines.

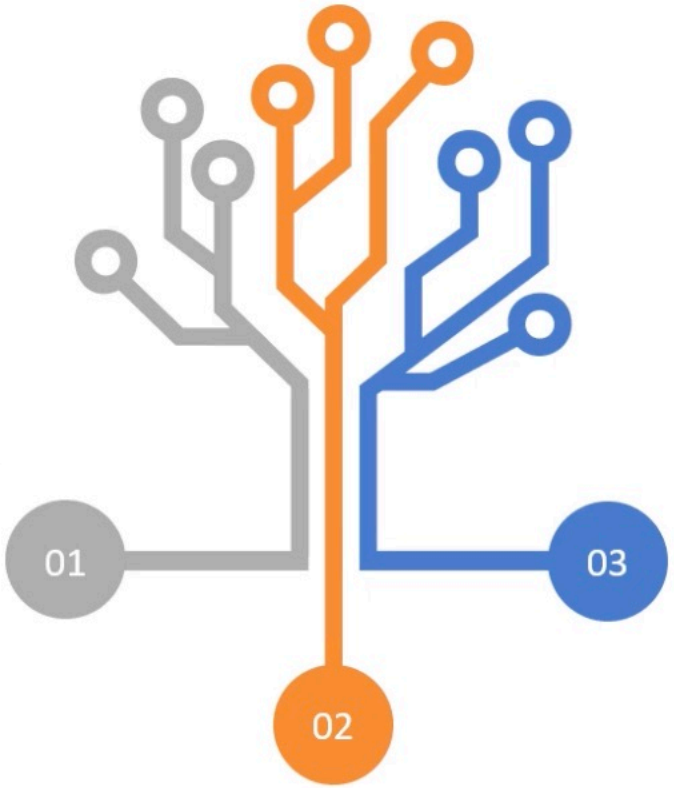
What is AI?

For a machine to be classified as AI, it must perform the tasks given below:



What Can AI Do?

AI can be a solution to these problems:



Superhuman Tasks

Challenging tasks for humans but can be done easily by machines

Repetitive Tasks

Tasks that require logical steps but are repetitive

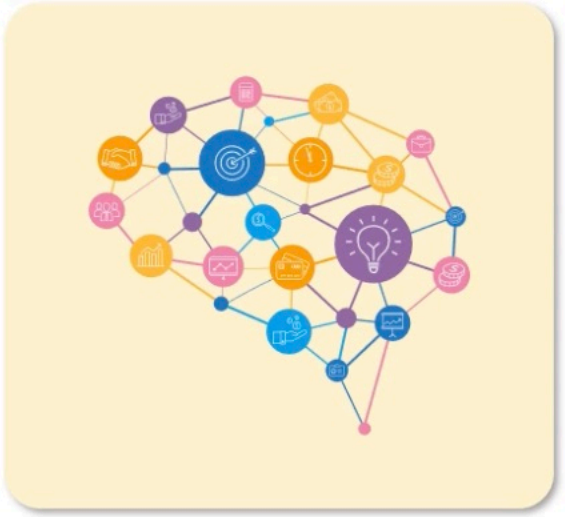
Data-Intensive Tasks

Analyzing large amounts of data looking for patterns and anomaly

Limitations of AI

The limitations of AI are:

It’s difficult to simulate human intelligence

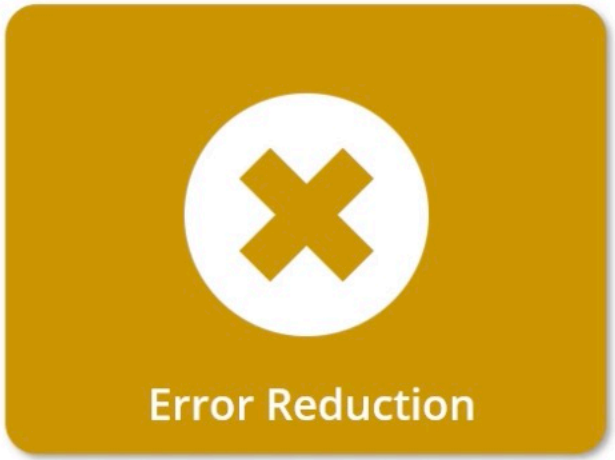


Existing ability is limited to certain domains

High development cost

Advantages of AI

The advantages of AI are:



AI Disruption in Various Industries

DIGITAL BUSINESS

AI Disruption in Various Industries

Personal Assistance

Medical Diagnosis and Prescription

Lead Generation

Stock Market Reports

Law

Scheduling Meetings

Manufacturing

Customer Service

Personal Assistance

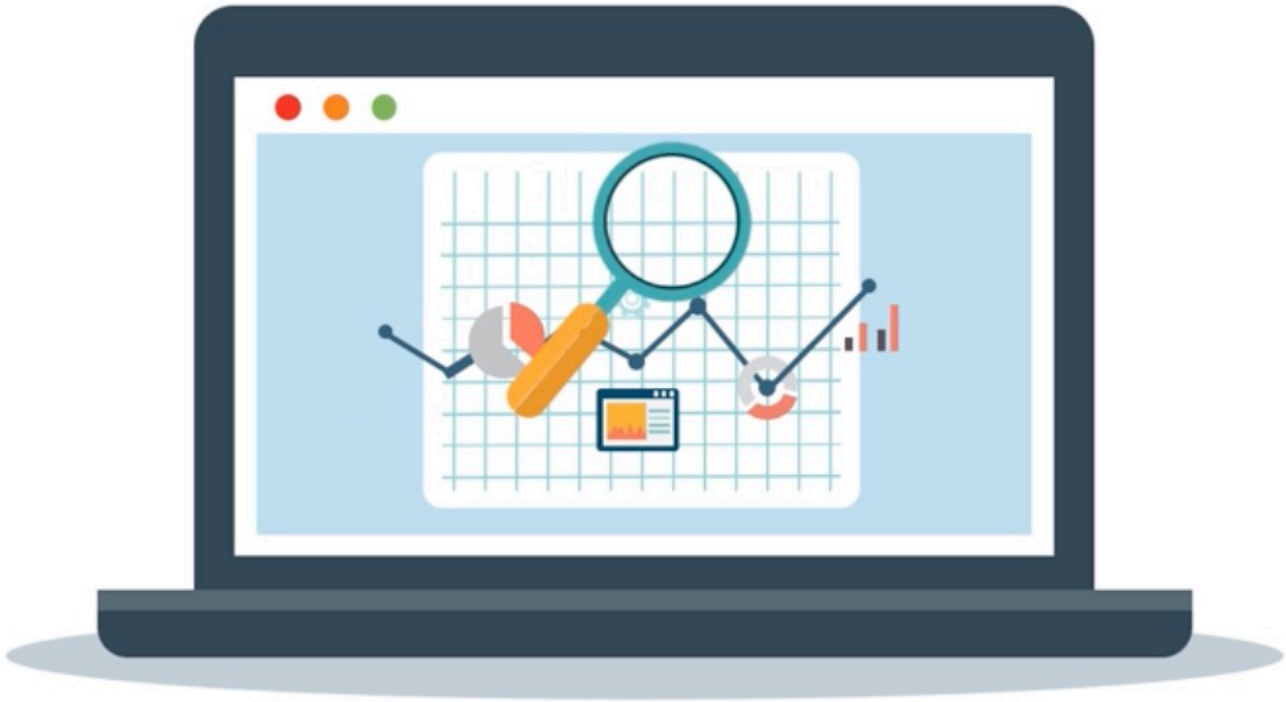
AI programs can talk to humans and provide solutions by searching the web thereby acting as personal assistants to humans.

Medical Diagnosis and Prescription

Lead Generation

leadGenius

Stock Market Reports

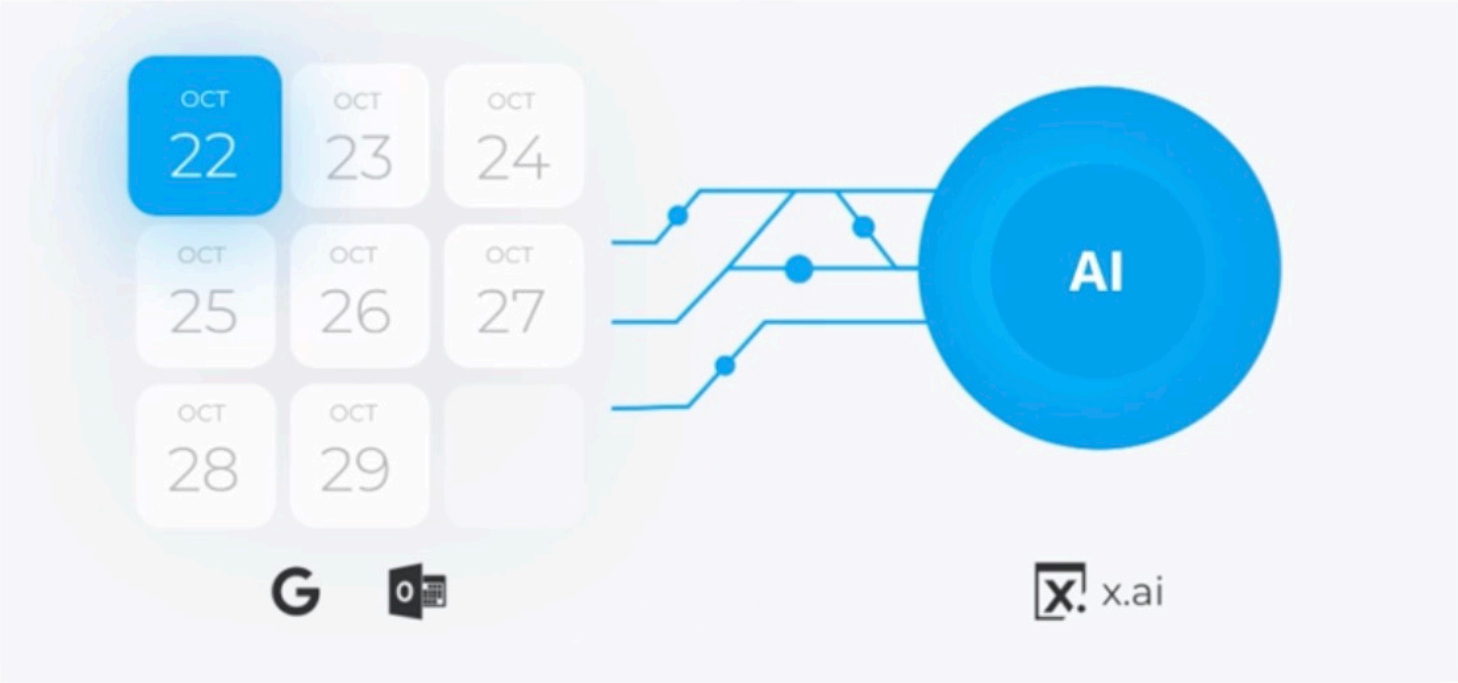


AI helps develop bots that create reports of stock market.

Law

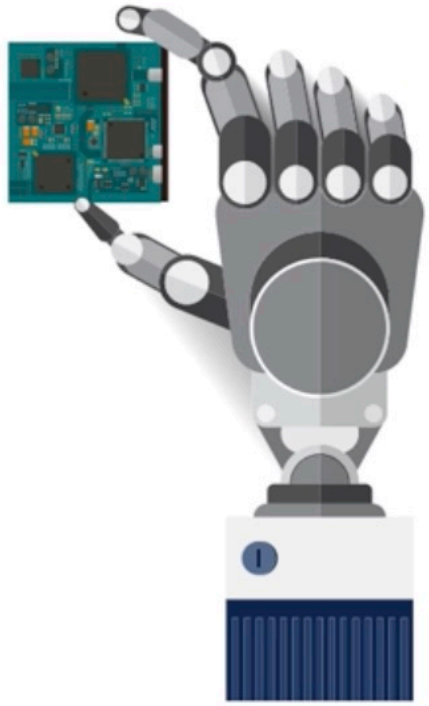
AI programs also help to draft legal letters.

Scheduling Meetings

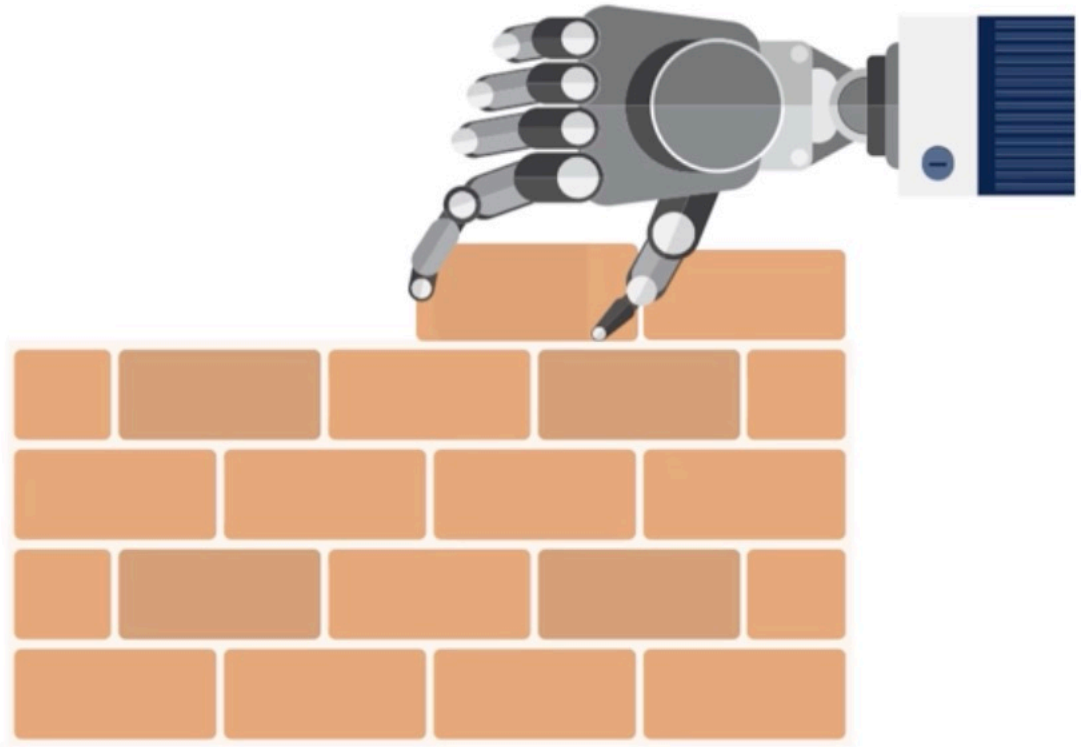


AI programs schedule meetings for us.

Manufacturing



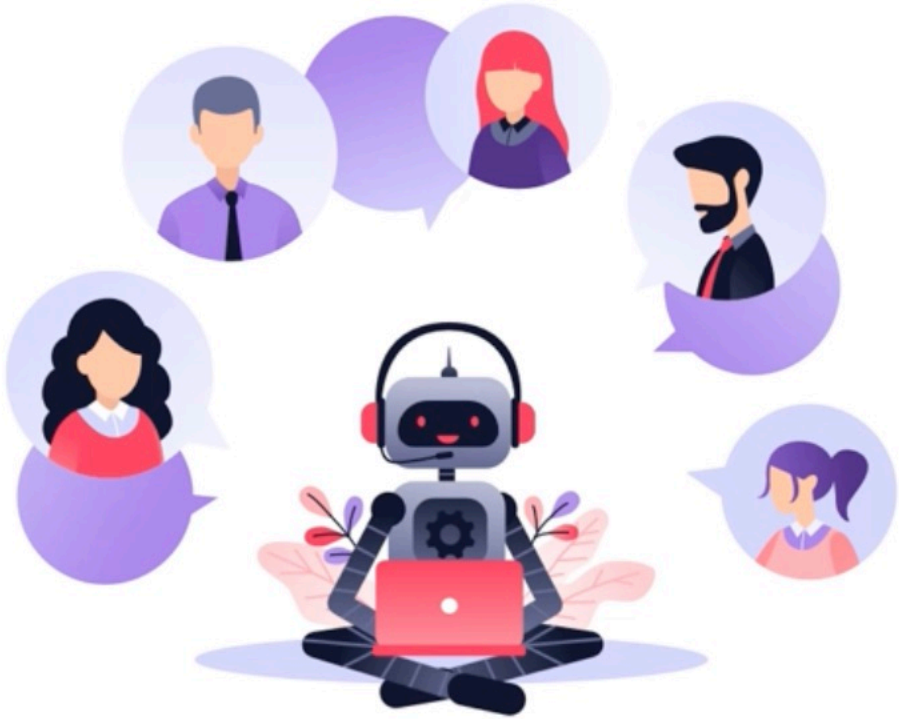
Electronics Industry



Construction Industry

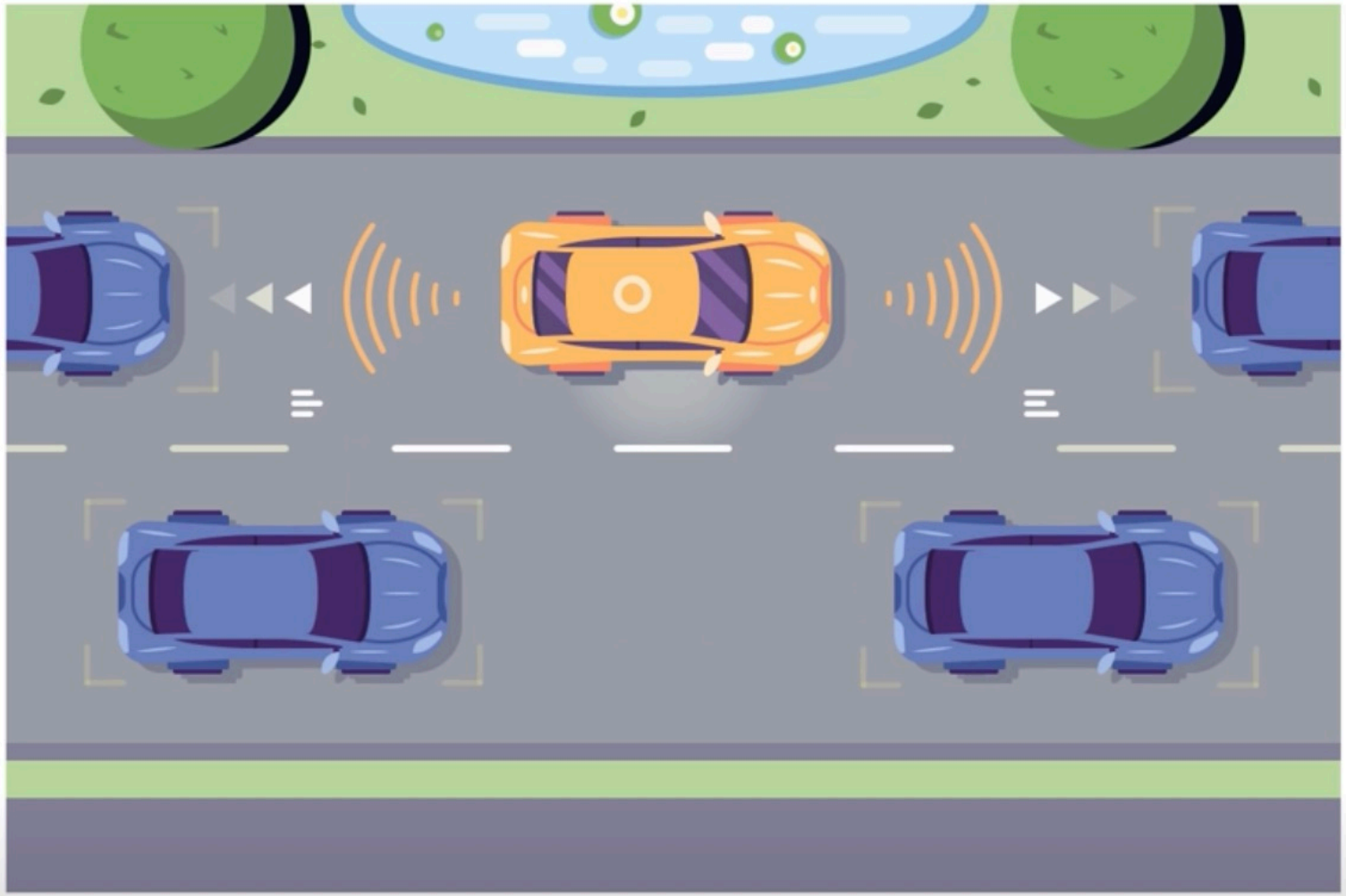
Customer Service

DigitalGenius



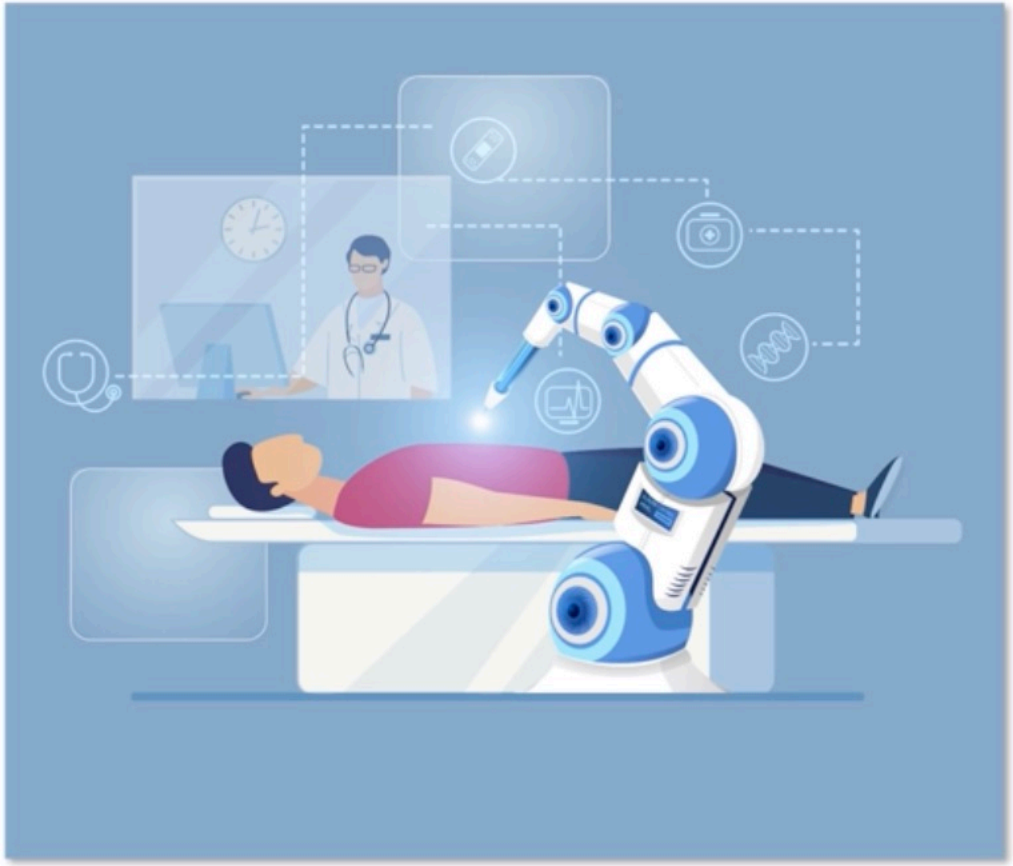
AI programs take care of different types of customer service.

Transportation



We find driverless cars on roads these days because of AI.

Surgery



AI-enabled robots perform surgeries.

Artificial Intelligence and Machine Learning Models

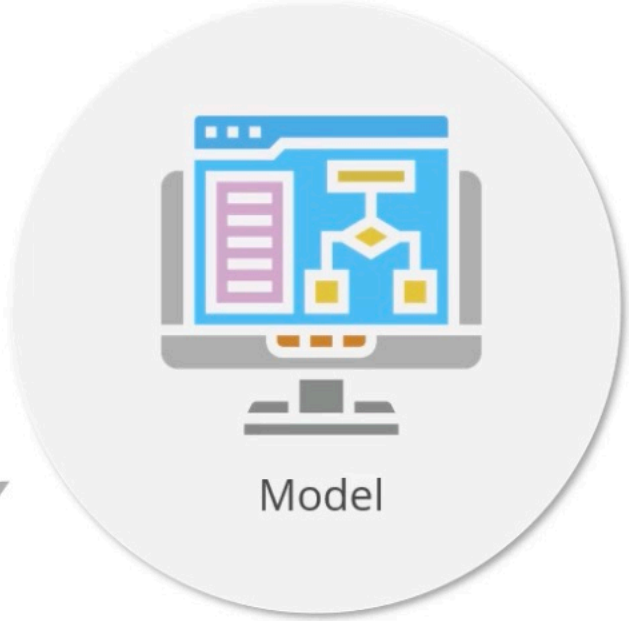
DIGITAL BUSINESS

What Are AI and ML Models?

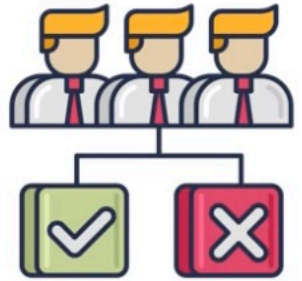
AI and ML models are mathematical algorithms.

Expert Inputs

Data

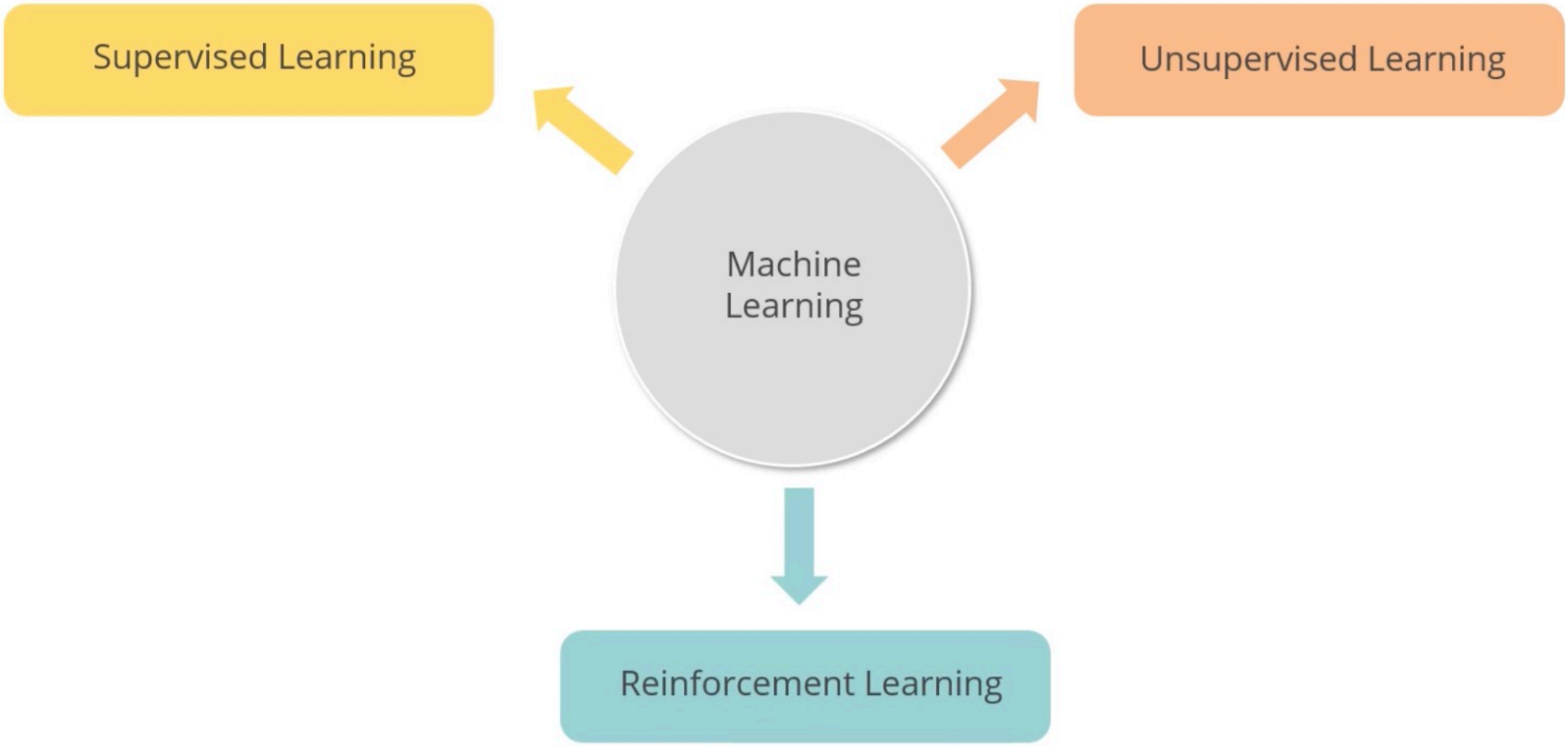


Training the Model

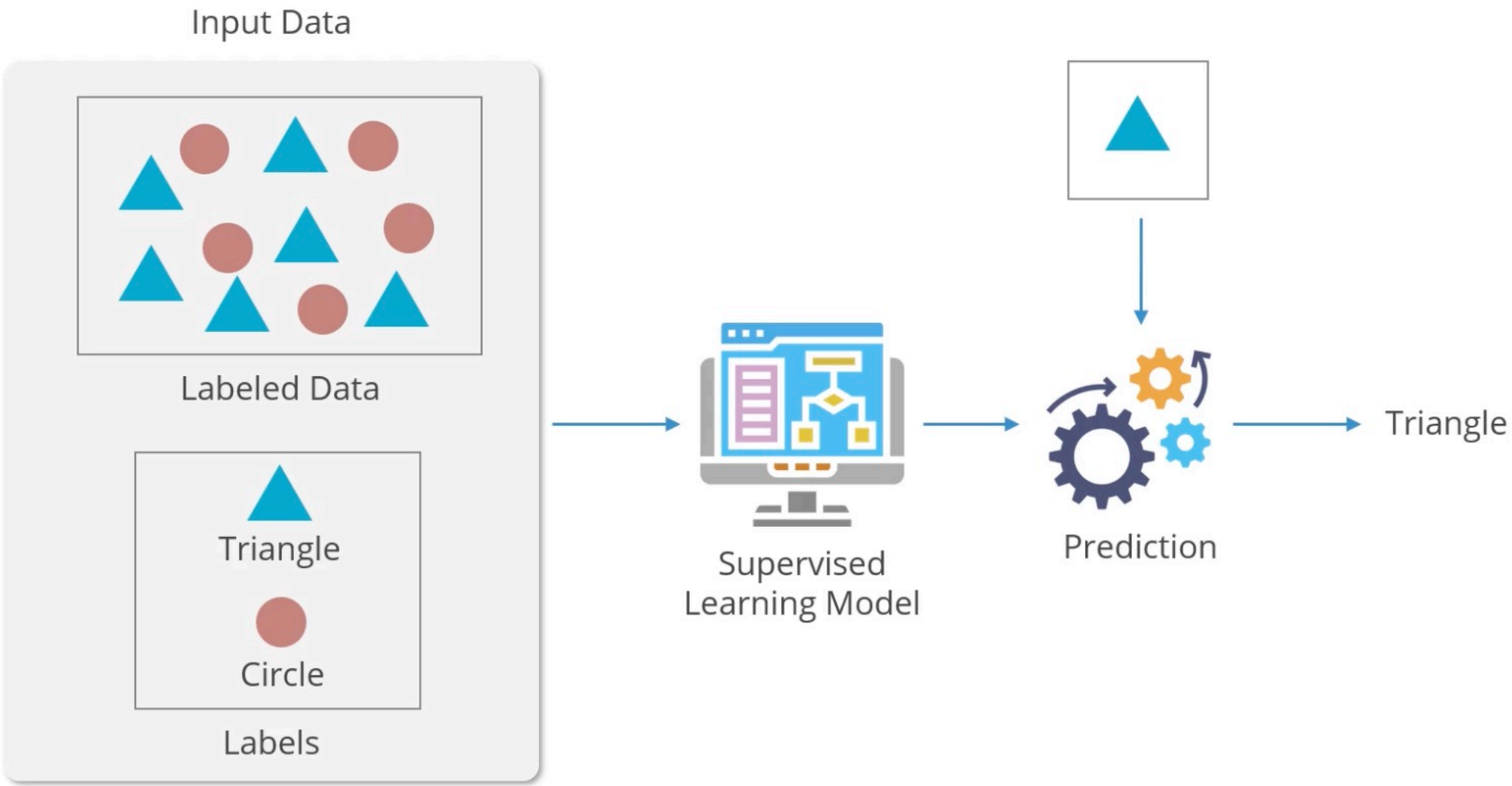


Expert Decision

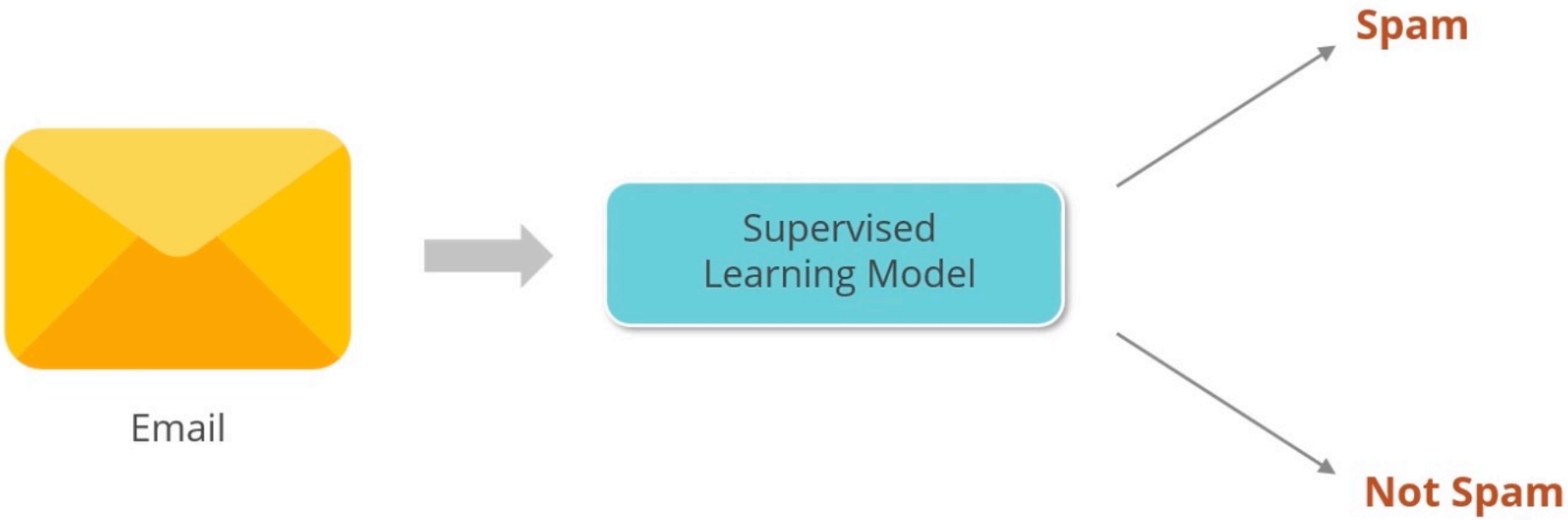
How Do AI and ML Models Learn?



Supervised Learning

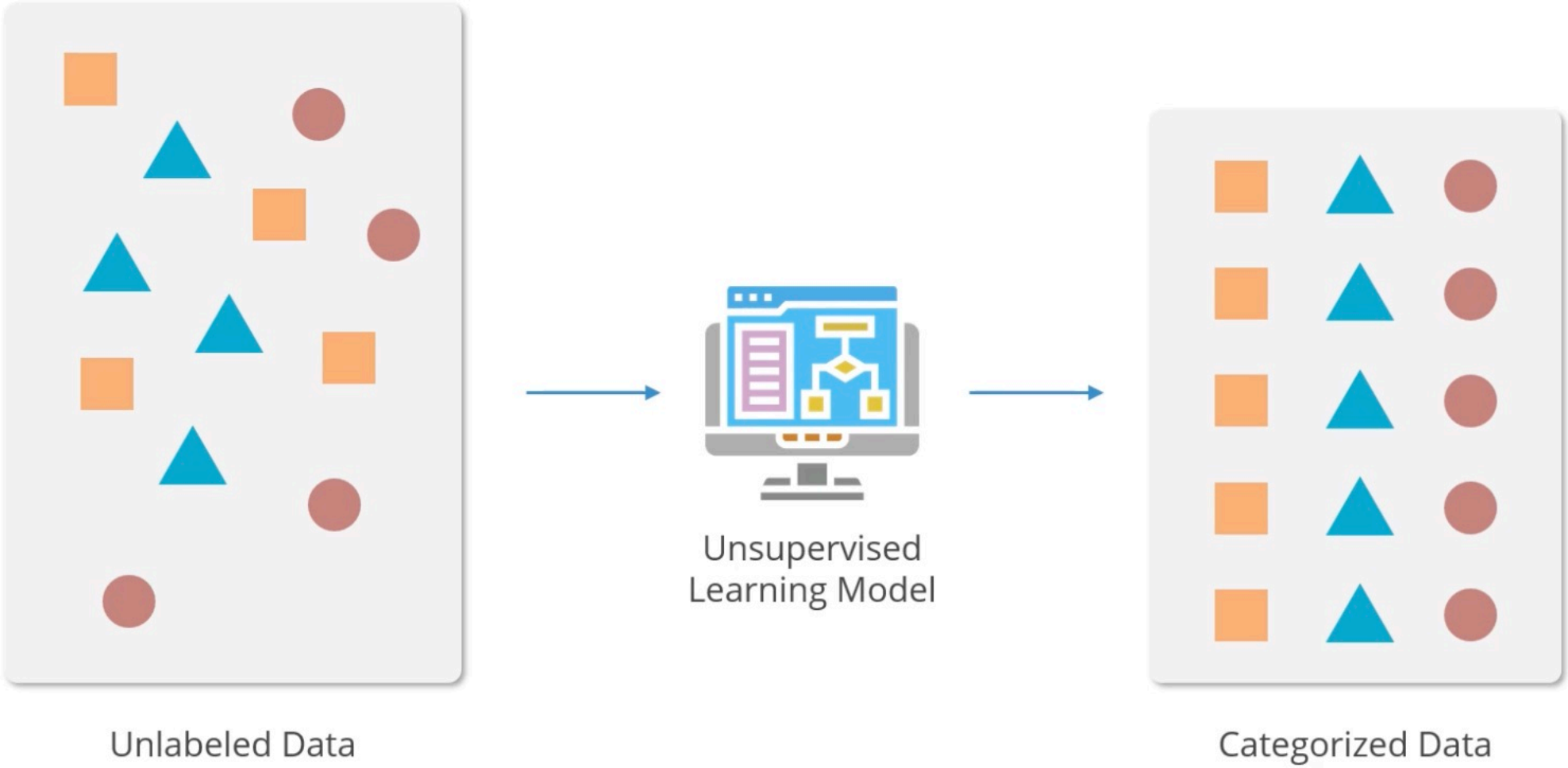


Supervised Learning

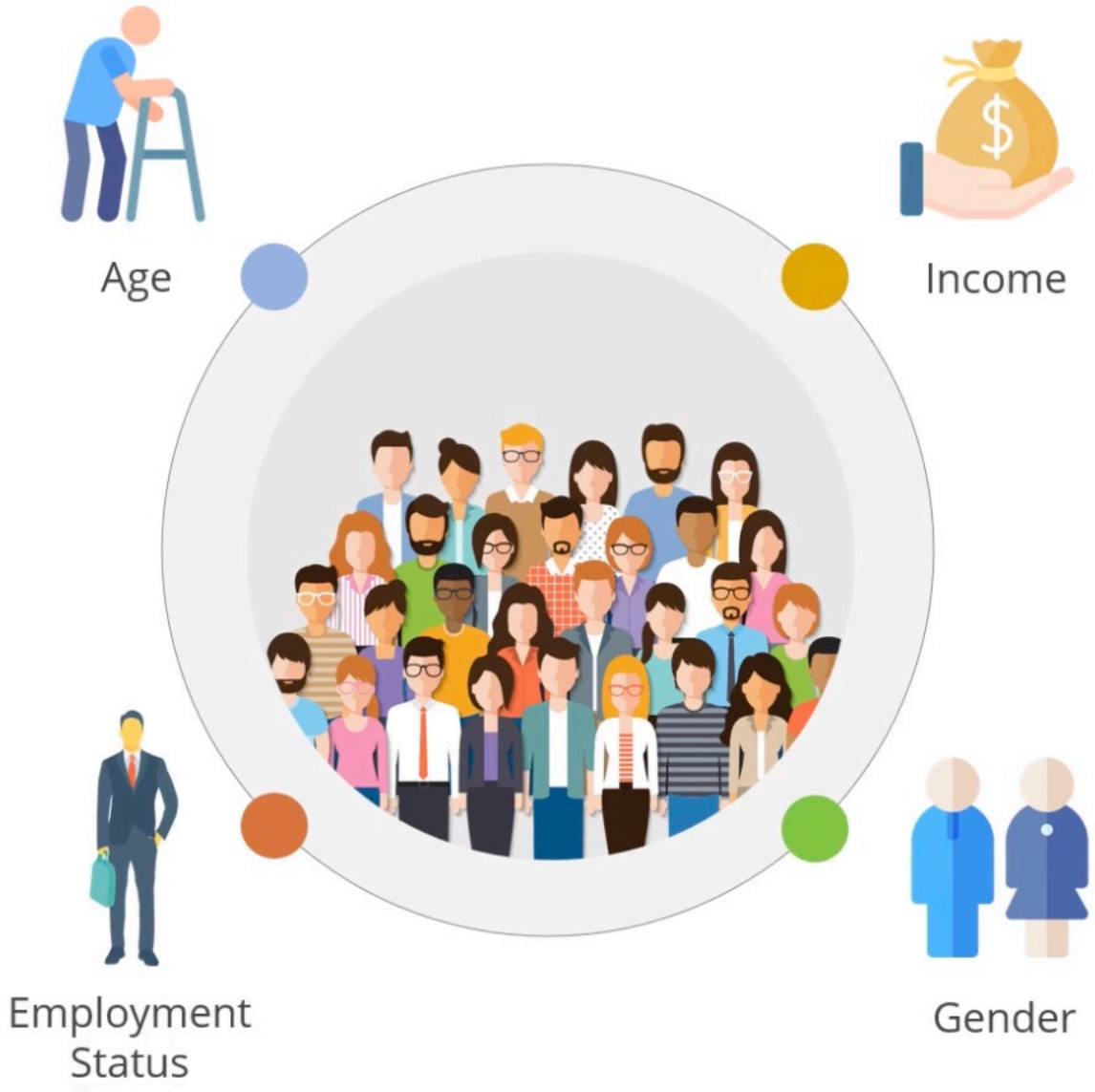


Filtering spam emails

Unsupervised Learning



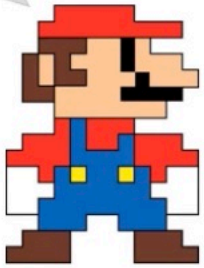
Unsupervised Learning



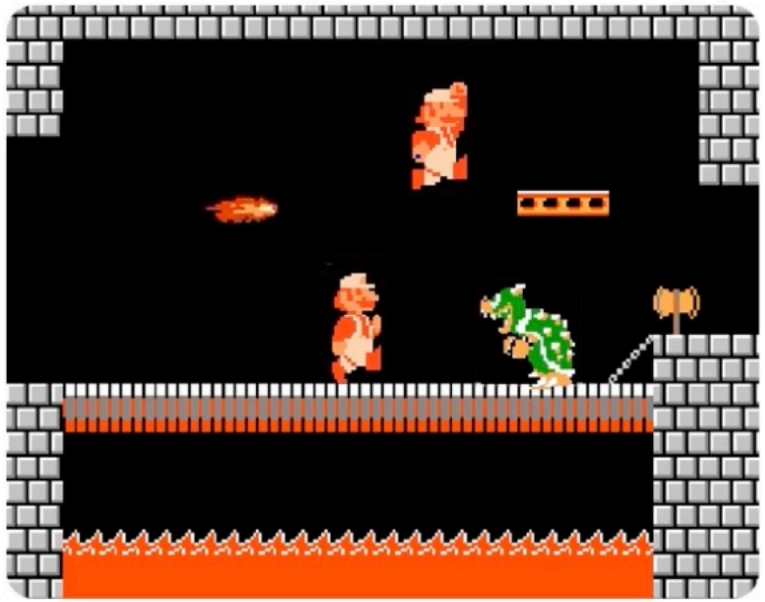
Reinforcement Learning

Reinforcement learning agents are goal oriented. They learn by trial and error in an environment that provides rewards or penalties in response to the agent's actions.

Goal



Agent



Environment

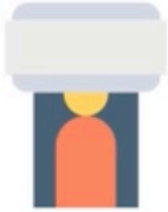
AI Implementation in Key Industrial Sectors

DIGITAL BUSINESS

Industries with AI Implementation

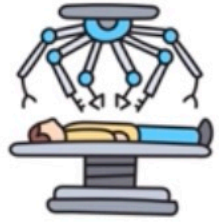
AI Implementation in Healthcare

Medical Imaging



Medication Management

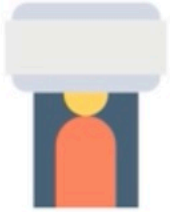
Drug Discovery



Robotic Surgery

AI Implementation in Healthcare

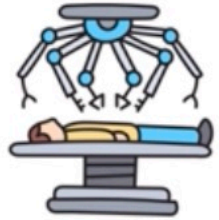
Medical Imaging



Medication Management

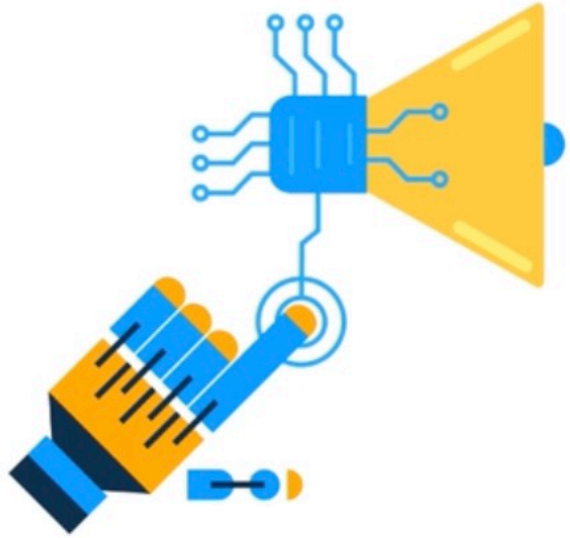
IBM Watson

Drug Discovery



Robotic Surgery

AI Implementation in E-commerce

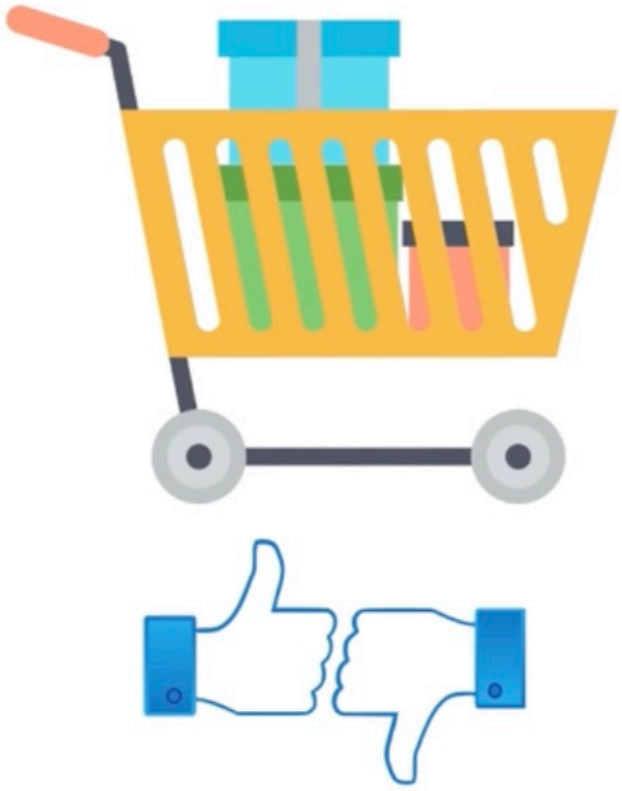


Product Recommendation

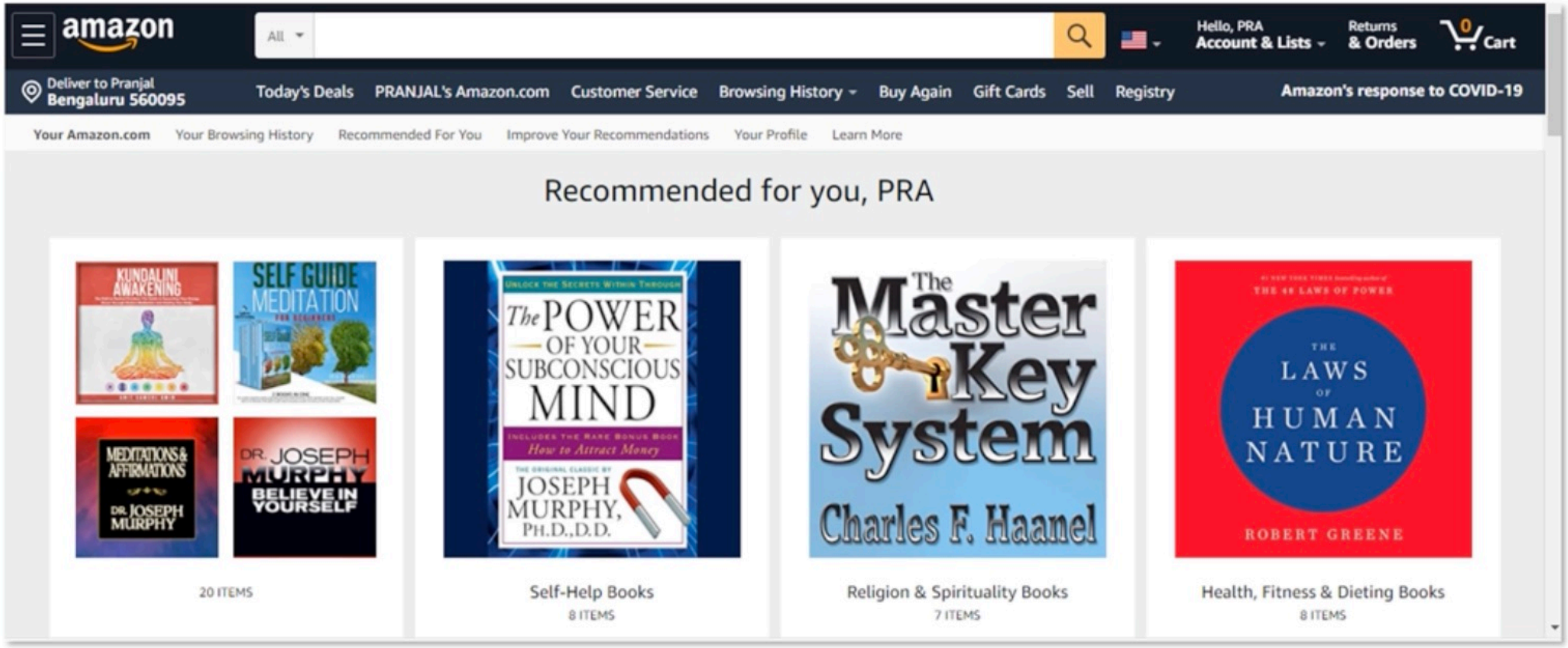
Chatbots

Inventory Management

Product Recommendation



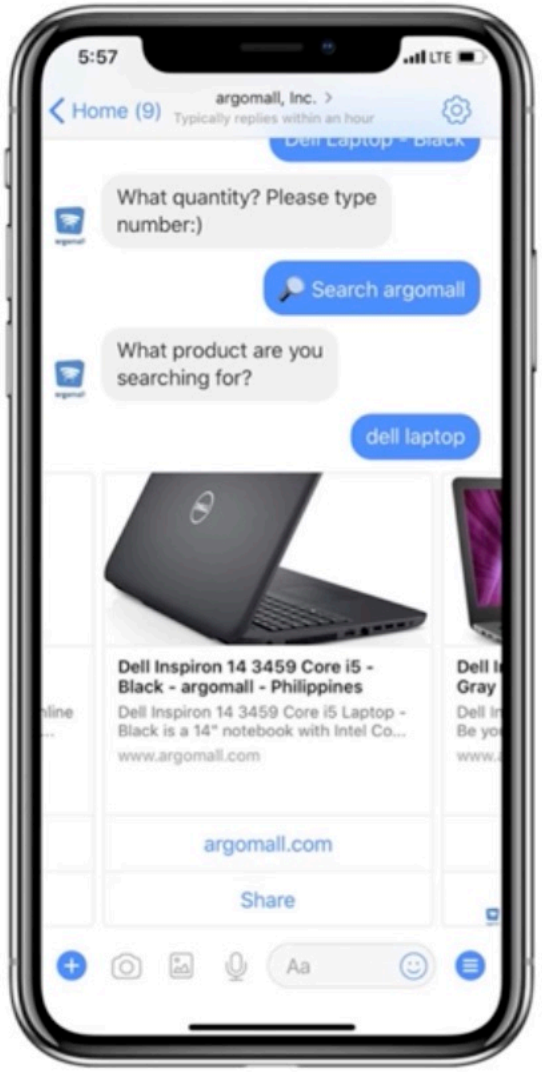
Product Recommendation



Amazon's Recommendations

Chatbots

Chatbots



Argomall chatbot interacting with customer

Inventory Management

Moving AI-enabled bot at Amazon's warehouse

AI Implementation in Banking and Financial services

Credit Decisions

Risk Management

Credit Decisions

Credit Decisions

Detection of
Underserved Applicants

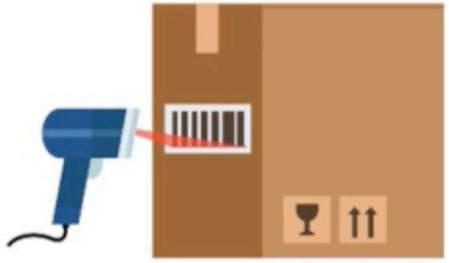
zestfinance

Risk Management

AI ML models help banks to do better predictions and manage risks.

AI Implementation in Logistics

Supply Chain Management



Tracking and Supervision

Route Optimization

AI Implementation in Real Estate

Finds buyers

Helps real estate agent

Digital Disruption and Strategies for Digital Transformation

Blockchain

DIGITAL BUSINESS

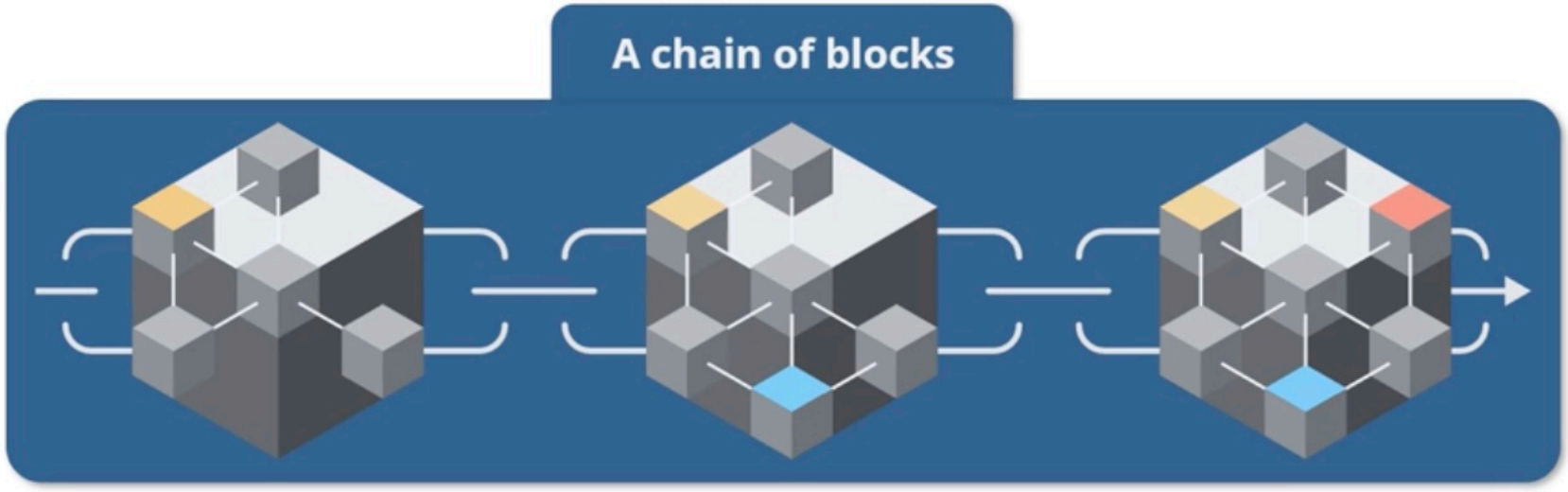
What Is Blockchain?

Blockchain is a decentralized, peer-to-peer digital ledger.

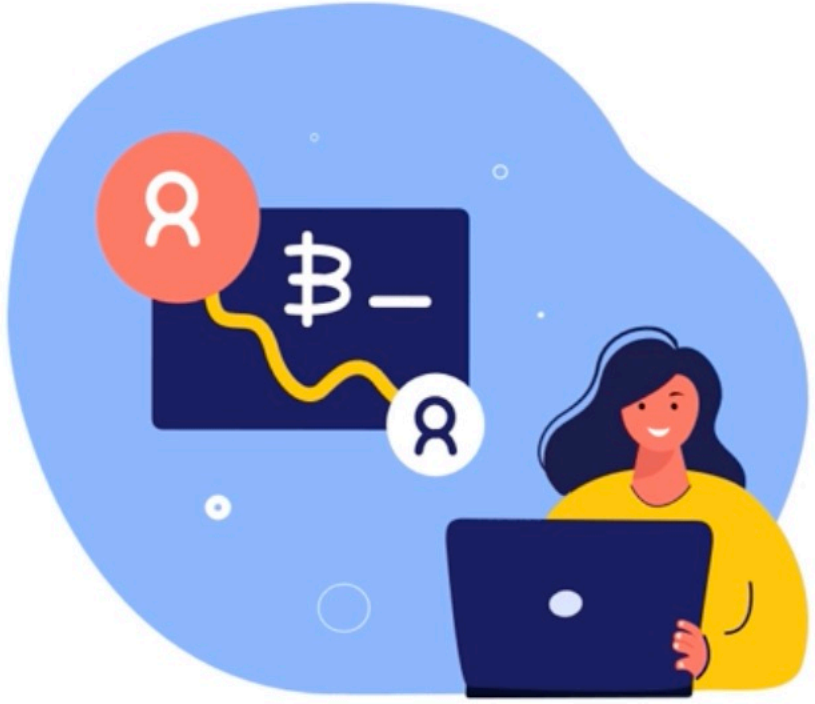
It enables transactions over the internet.

What Is Blockchain?

Several verified transactions are added to the existing chain.

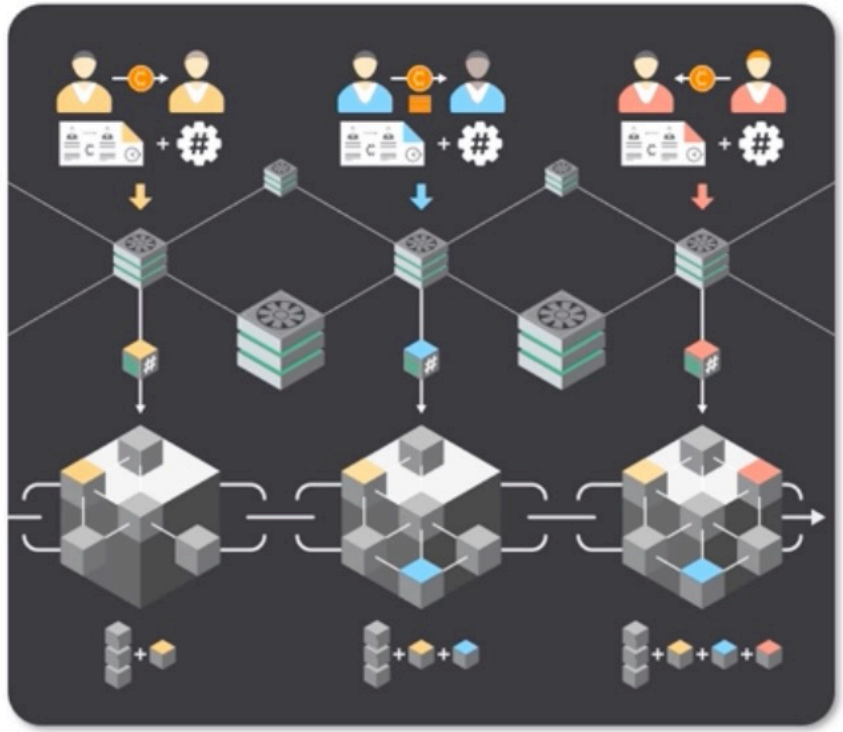


What Is Blockchain?



Blocks in a Chain

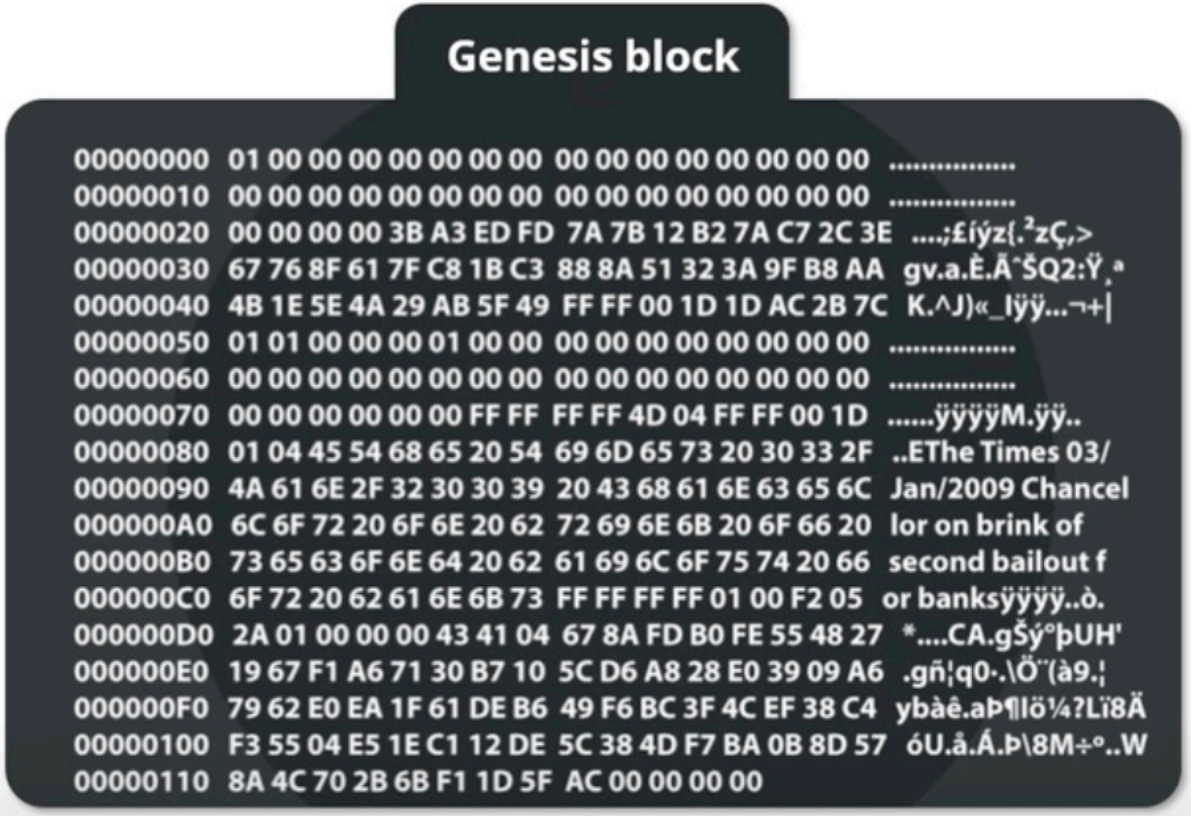
A cryptographic hash links each block with the previous one, along with details of the transaction.



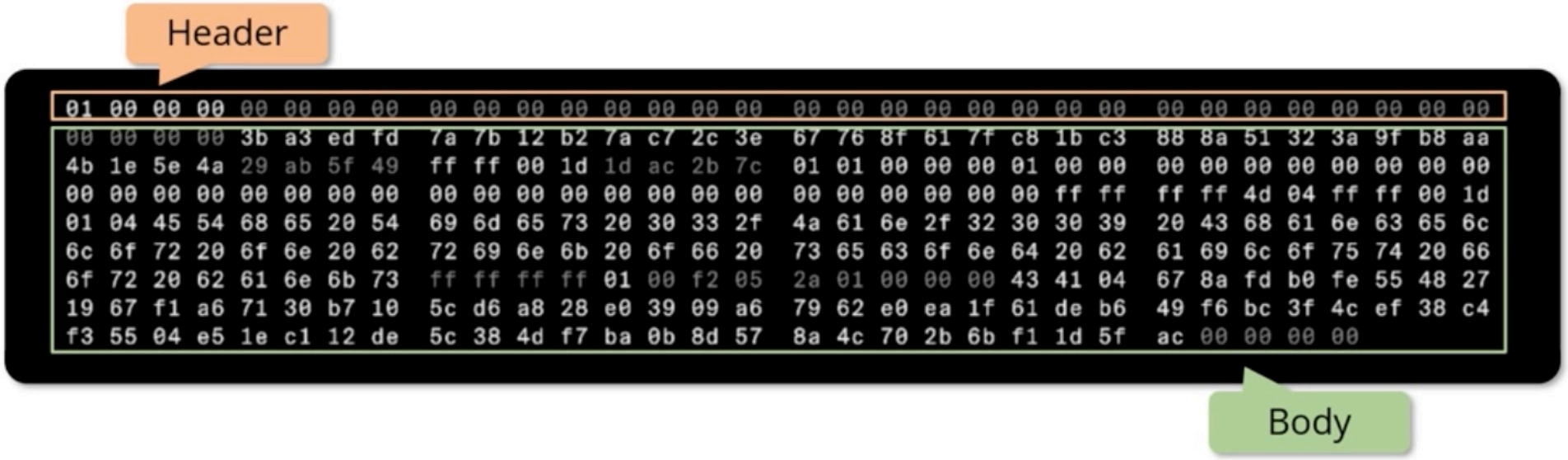
Once added to the network, a block can never be modified.

Blocks in a Chain

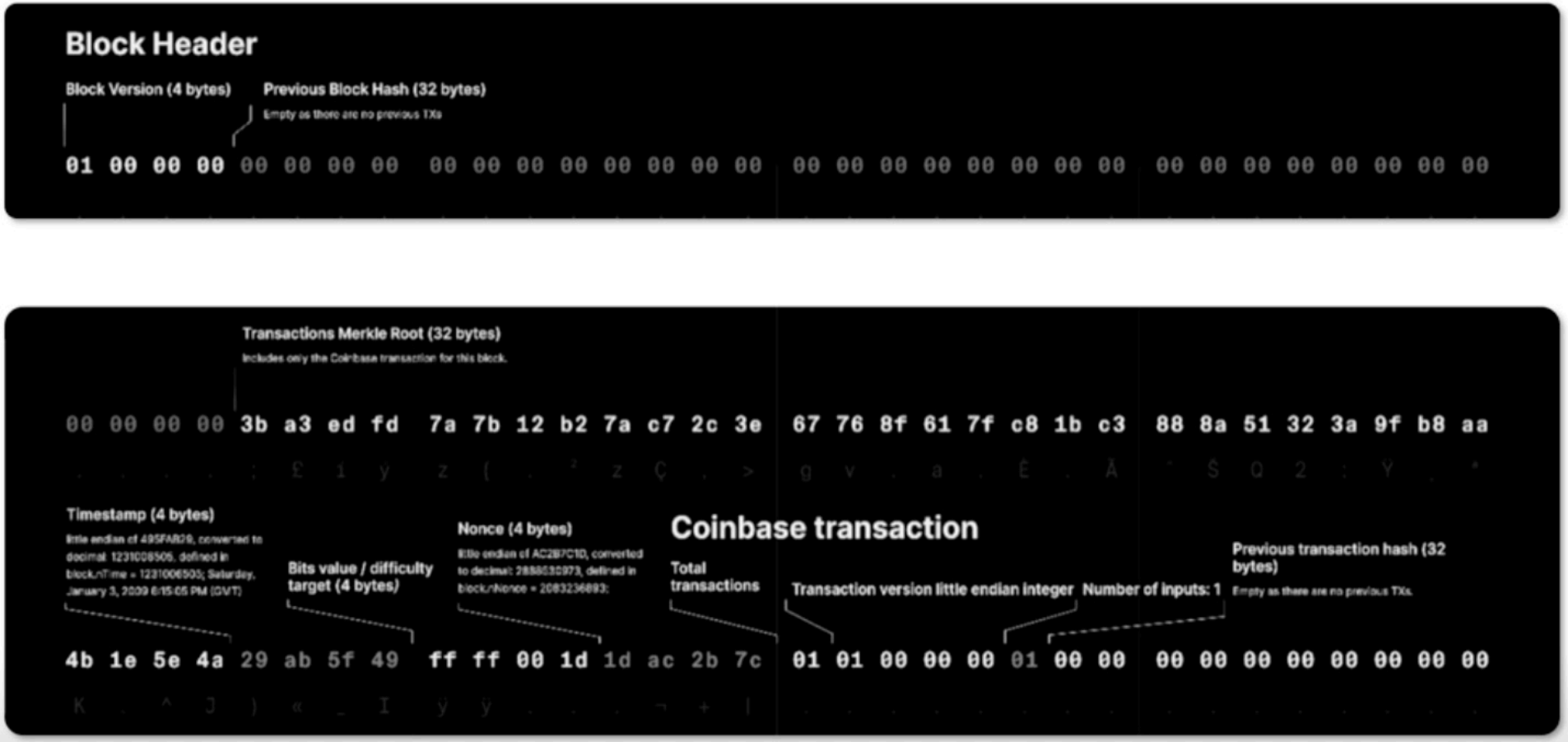
The first block in a Blockchain network is called the *Genesis* block.



Parts of a Block



Parts of a Block



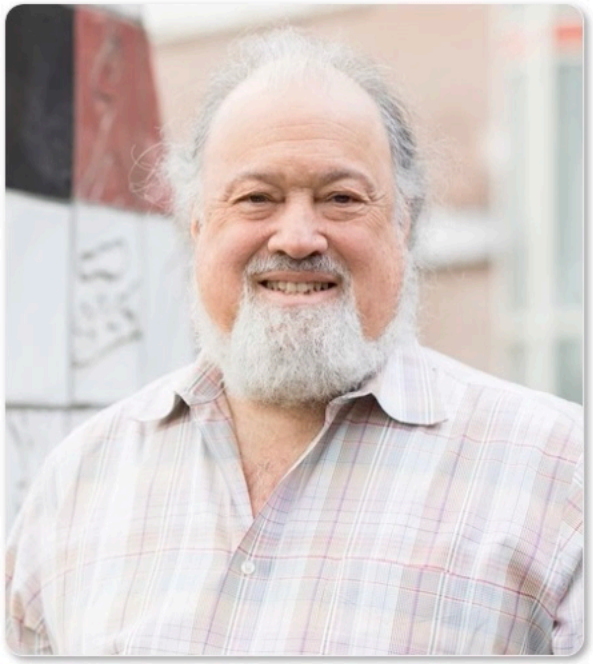
Features of Blockchain

- Has automated operations
- Is chronological and time-stamped
- Has secure and distributed settlement

History of Blockchain

DIGITAL BUSINESS

History of Blockchain



David Chaum

Computer Systems

Established, Maintained, and Trusted

by Mutually Suspicious Groups

© 1982 by David L. Chaum

Bitcoin and Blockchain

DIGITAL BUSINESS

Bitcoin and Blockchain

Blockchain enables transactions on the internet.

Bitcoin and Blockchain

Blockchain enables transactions on the internet.

Bitcoin is Blockchain's first application.

What Is Bitcoin?

It is a cryptocurrency invented by Satoshi Nakamoto in 2008.

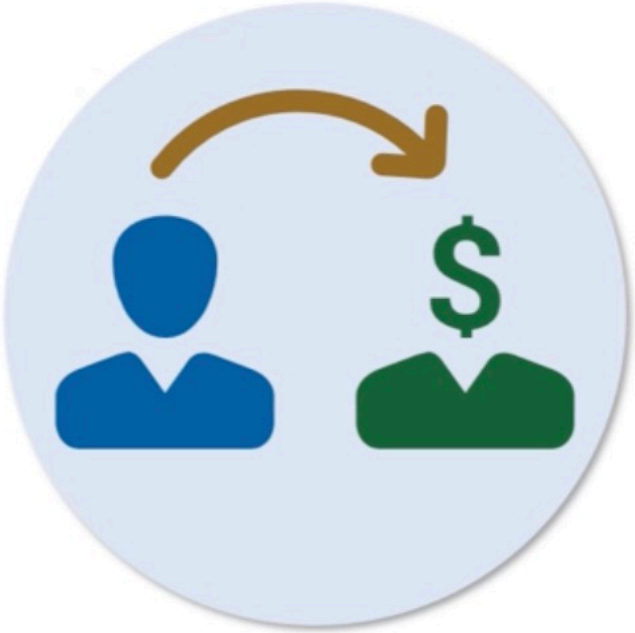
What Is Bitcoin?

It is a cryptocurrency invented by Satoshi Nakamoto in 2008.

$15000 = ฿1

The ledger size of bitcoin is 200GB.

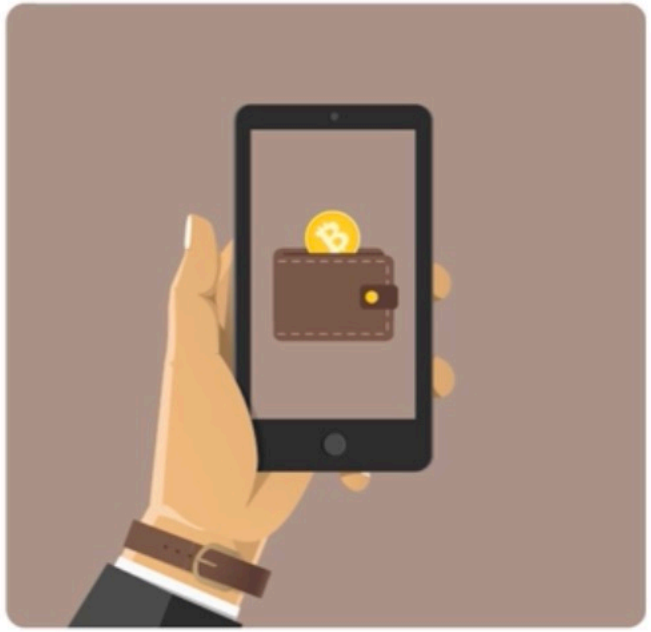
How Does Bitcoin Function?



How Does Bitcoin Function?

The miner gets some bitcoin as commission working on the transaction.

How to Use Bitcoin?



Install the Bitcoin wallet on a mobile or laptop

Then the first bitcoin address will be generated

How to Use Bitcoin?

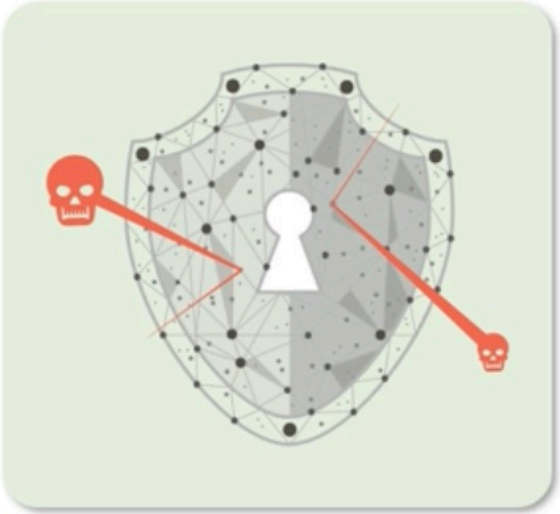
Send this address to whoever you want to transact with using bitcoins

Advantages of Bitcoin

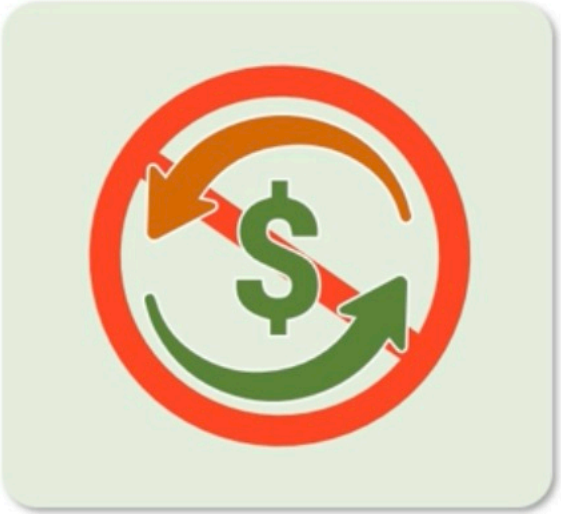
Some of the advantages of bitcoin are:

No tax applied on payments

Cannot be stolen



No third party can interfere in transactions



Completed transactions cannot be reversed

Disadvantages of Bitcoin

Some of the disadvantages of bitcoin are:

Does not have a physical form like cash

Value is always fluctuating

Risk of value falling from high levels

Types of Blockchain

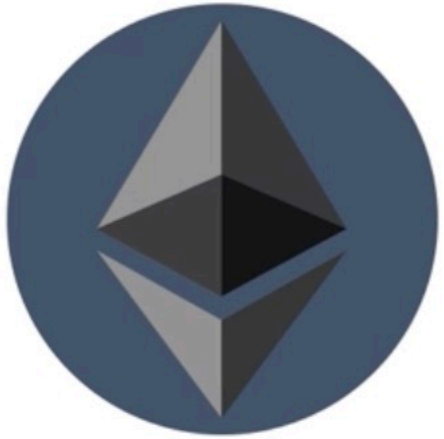
DIGITAL BUSINESS

Public Blockchain

Public Blockchain

Bitcoin

Litecoin



Ethereum

Private Blockchain

Private Blockchain

Hybrid Blockchain

Blockchain for Digital Transformation

DIGITAL BUSINESS

Impact of Blockchain

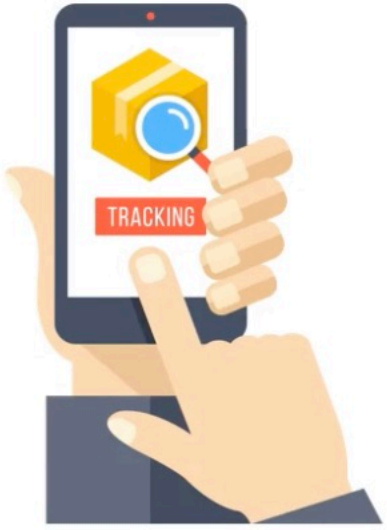
Blockchain eliminates all these intermediaries, thereby allowing secure transactions to be carried out instantly.

Impact of Blockchain

Blockchain services enable digital trust between suppliers and consumers.

They also reduce the transaction time between manufacturers and retailers globally by 35%.

It improves the efficiency of global supply chains.



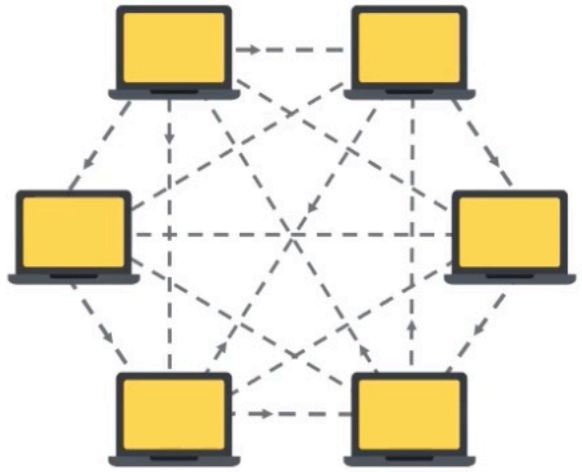
It allows consumers to access product histories.

Blockchain for Digital Transformation

Following are the ways we can use Blockchain for digital transformation:

Digital Transactions:

- Blockchain works on a decentralized peer-to-peer distributed network, having a high level of trust and security.



Blockchain for Digital Transformation

Following are the ways we can use Blockchain for digital transformation:

Digital Transactions:

- Blockchain works on a decentralized peer-to-peer distributed network, having a high level of trust and security.
- Therefore, it is the safest and most reliable technology for digital transactions.

Blockchain for Digital Transformation

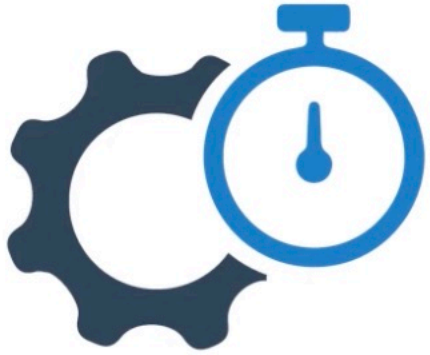
Automated Business Processes:

- Blockchain can store and transfer business processes, as it is highly secure and swift.

Blockchain for Digital Transformation

Automated Business Processes:

- Blockchain can store and transfer business processes, as it is highly secure and swift.
- Implementing fully automated transactions in different business areas can speed up the transactions, thereby enabling higher efficiencies in the operational process.



Blockchain for Digital Transformation

Automated Business Processes:

- Blockchain can store and transfer business processes, as it is highly secure and swift.
- Implementing fully automated transactions in different business areas can speed up the transactions, thereby enabling higher efficiencies in the operational process.
- This will help in cost reduction and a higher return on investment.

Blockchain for Digital Transformation

Transparency in Supply Chain:

Every transaction in the supply chain can be performed and tracked in Blockchain at low cost and high speed.

Low Cost

High Speed

Blockchain for Digital Transformation

Data Management:

- The communication between devices using IoT and cloud-based services can generate huge data volumes. This will lead to reengineering business processes to streamline data flow among all the organization's entities.
- Using Blockchain platforms, you can manage the data securely and with complete trust between the two parties in the transaction.

Blockchain for Digital Transformation

Smart Contracts Platform:

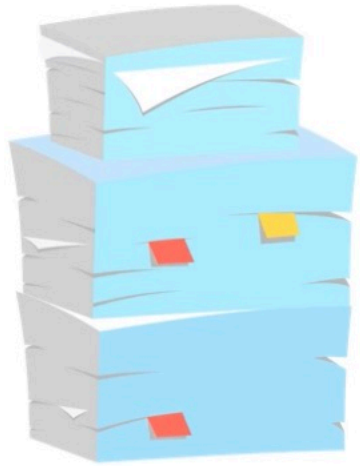
Since Blockchain provides a secure and transparent network, it would be the preferred medium for smart contracts to document and validate legal agreements between two parties.

Blockchain for Digital Transformation

Smart Contracts Platform:

Since Blockchain provides a secure and transparent network, it would be the preferred medium for smart contracts to document and validate legal agreements between two parties.

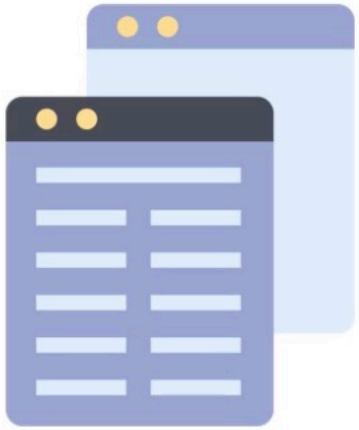
Examples: Purchase agreements, loans, mortgages, leases, and invoice agreements.

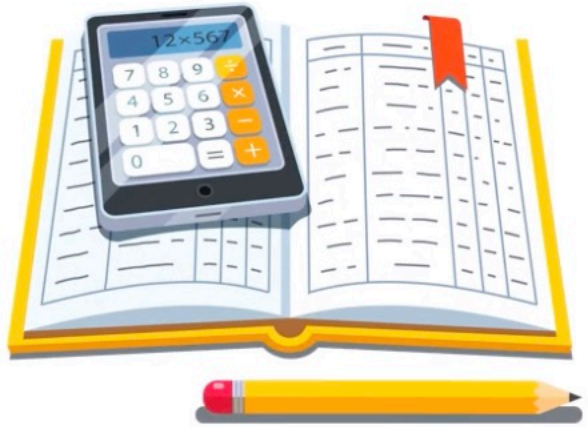


Blockchain for Digital Transformation

Blockchain as a Distributed Ledger:

Every accounting and finance entry in an organization's processes can be recorded through the Blockchain using the decentralized distributed ledger technology.





Applications of Blockchain

DIGITAL BUSINESS

Applications of Blockchain

- Banking
- Real estate
- Supply chain
- Healthcare
- Agriculture

Supply Chain Management

With Blockchain, customers can track the source of the products.

Supply Chain Management

This is useful in validating the authenticity of the products and eliminating counterfeit goods.

Supply Chain Management

This is useful in validating the authenticity of the products and eliminating counterfeit goods.

Banking

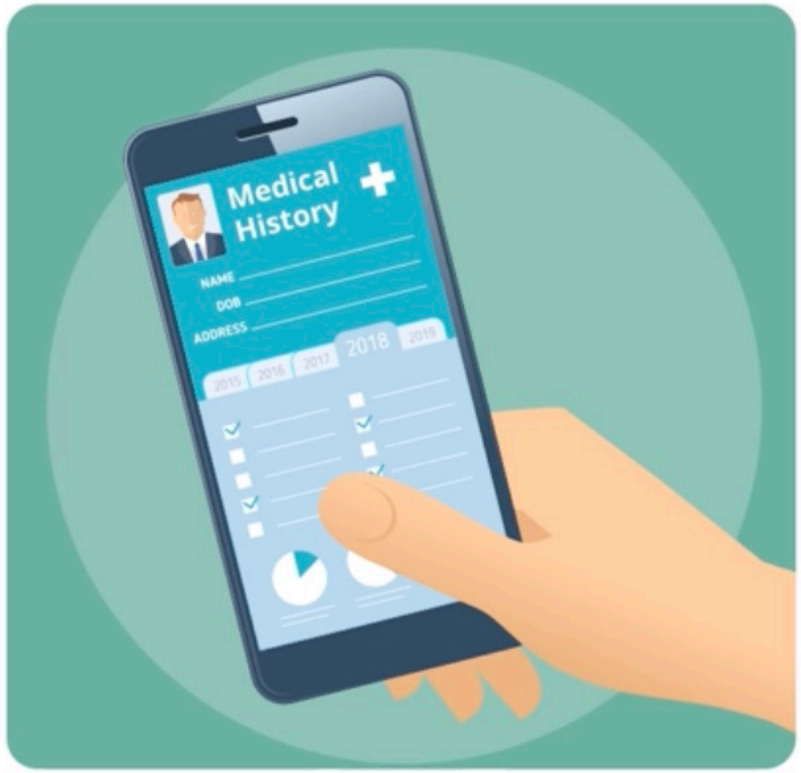
Blockchain helps in the international transfer of funds between a sender and receiver.

Real Estate

Any buyer can verify the land owner's credibility, since land records are registered on the Blockchain network.

Healthcare

Patients' medical history can be recorded and accessed through Blockchain.

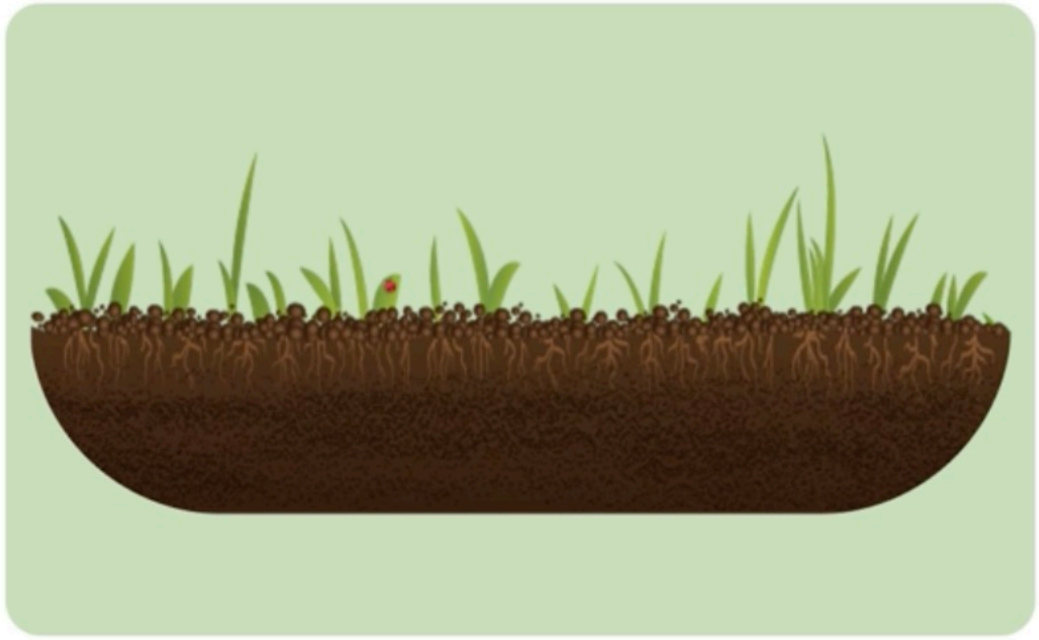


Healthcare

Counterfeit medicines can be identified through the Blockchain network.

Agriculture

The quality of vegetables and fruits can be gauged by tracking the soil and pesticides.



Soil

Pesticides

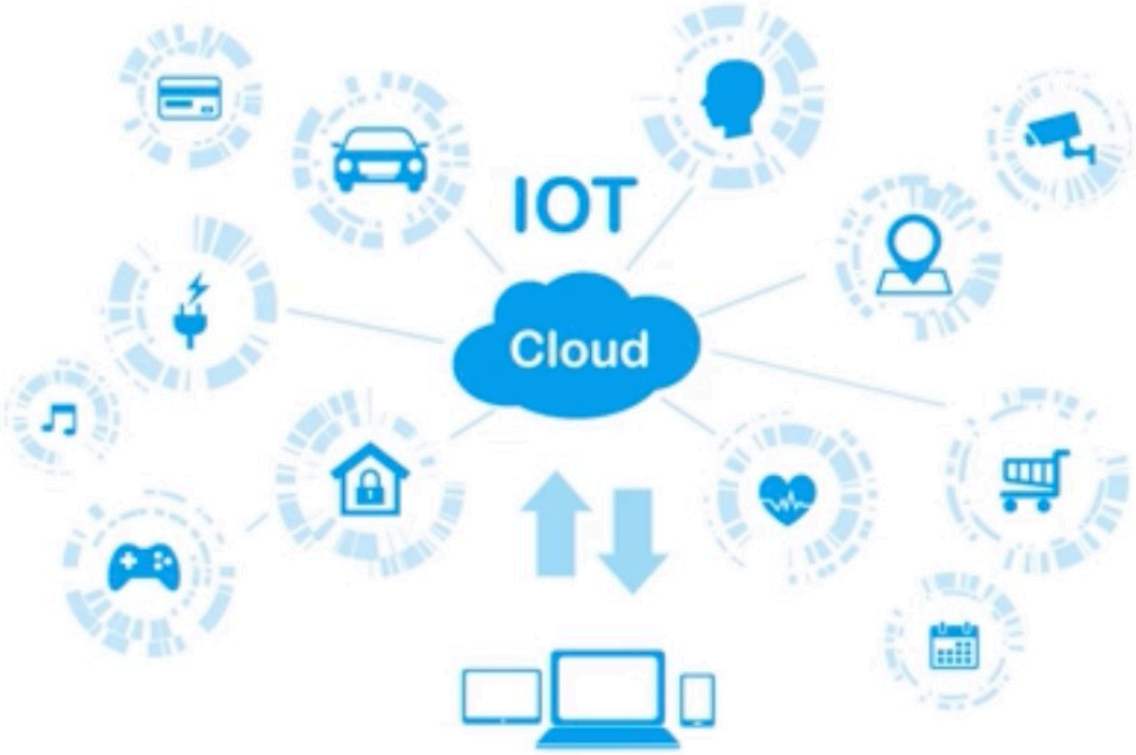
Digital Disruption and Strategies for Digital Transformation

Internet of Things

DIGITAL BUSINESS

Learning Objectives

In the digital era, every business is adopting IoT to expand itself.



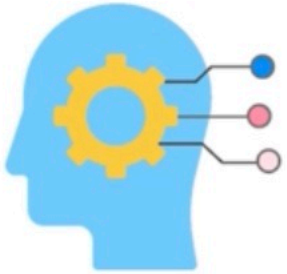
IoT is one of the most significant digital disruptors.

What Is IoT?

Connected network of physical objects over the internet that enables exchange of real-time data

What is IoT?

Real-Time Analytics



Machine Learning and Artificial Intelligence

5G

Cloud

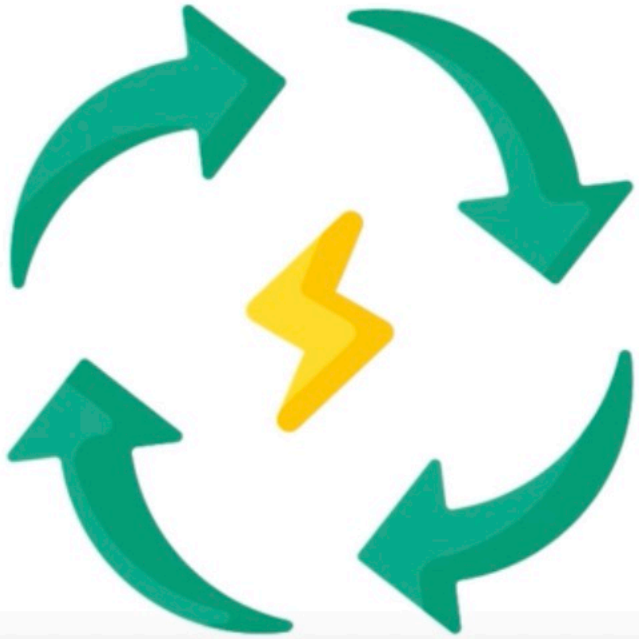
Applications of IoT

Applications in Home

Applications in Industry

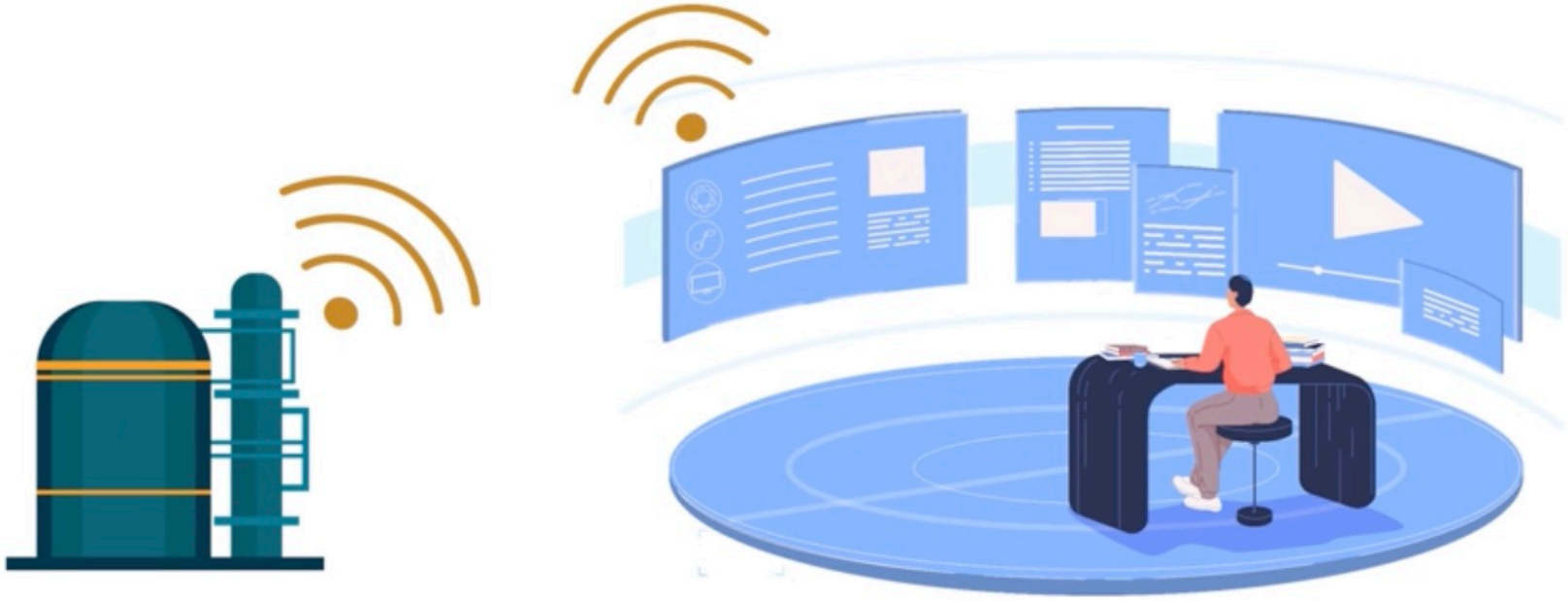
Applications of IoT: Smart Factory

IoT-enabled manufacturing is called Smart Manufacturing or *Smart Factory*.



Applications of IoT: Smart Factory

IoT-enabled manufacturing is called Smart Manufacturing or *Smart Factory*.

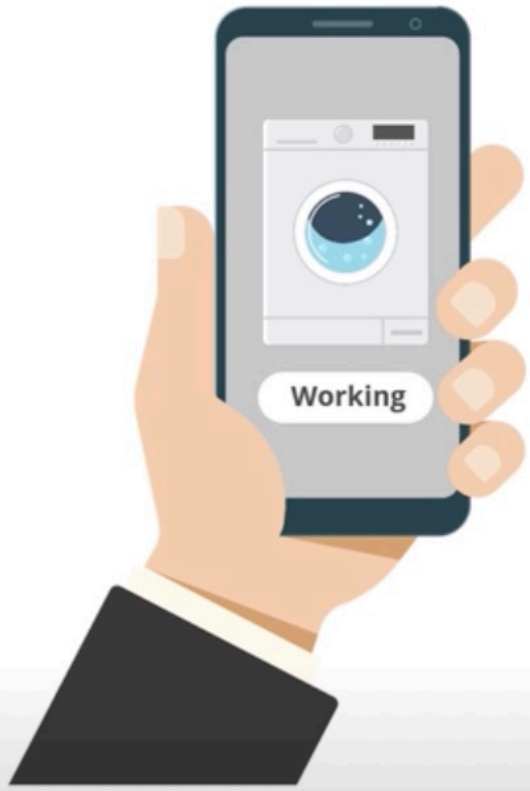


Applications of IoT: Smart Homes

Homes with IoT-enabled appliances are called *Smart Homes*.

Applications of IoT: Smart Homes

Homes with IoT-enabled appliances are called *Smart Homes*.



IoT-Enabled Industries

DIGITAL BUSINESS

IoT in Healthcare

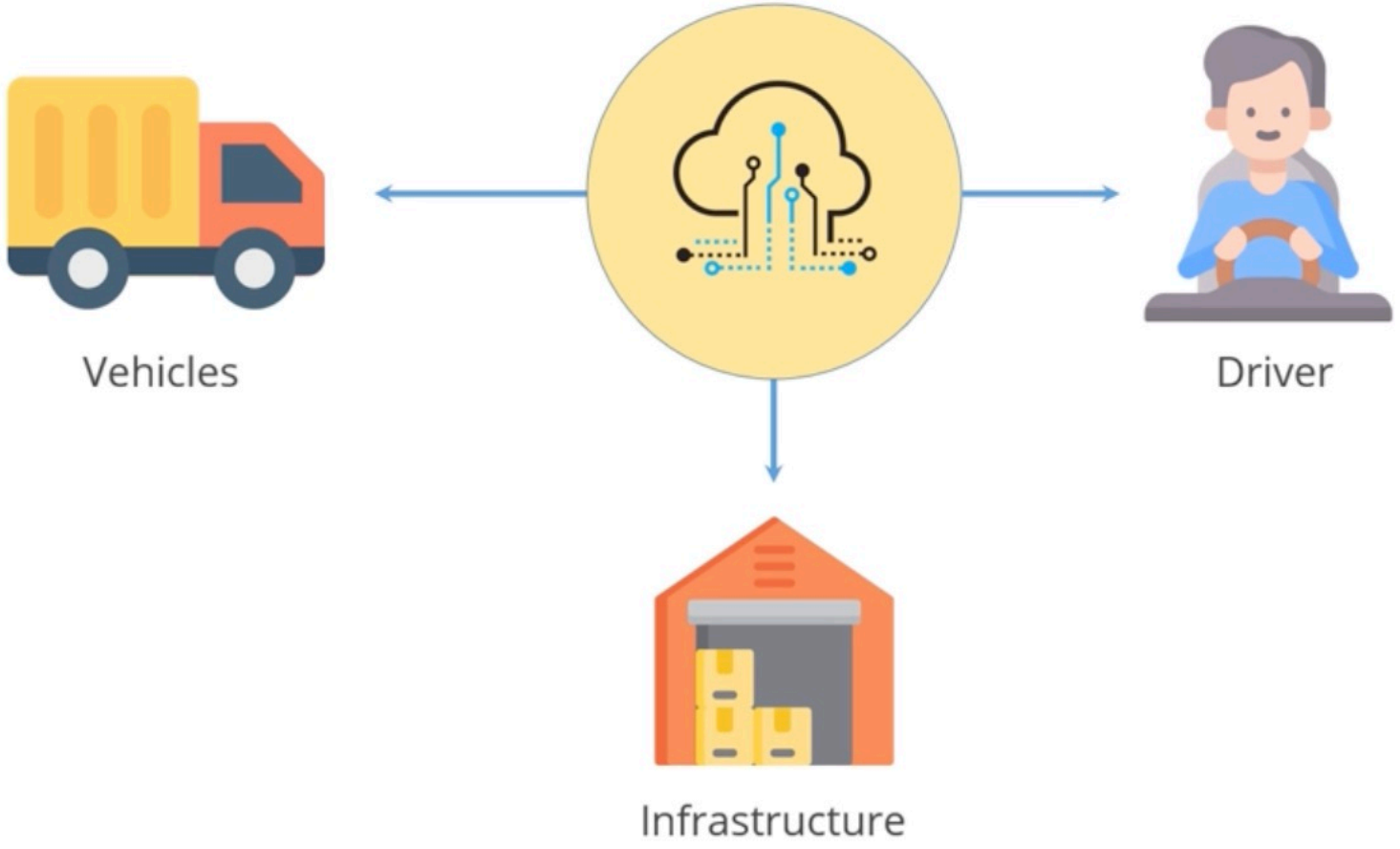
IoT helps remote monitoring of patient's health.

Health Monitoring

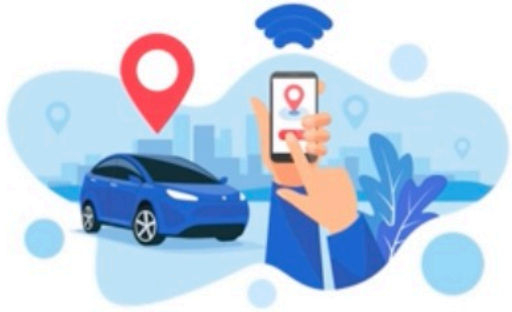
Wearable Devices

IoT in Transportation

IoT integrates different components of transportation system.



IoT in Transportation



IoT in Manufacturing

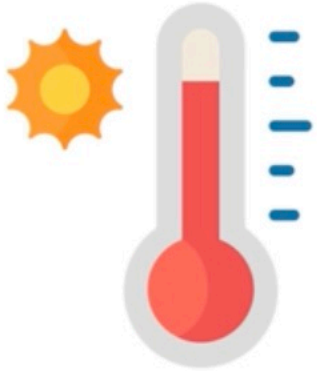
IoT has enabled integration of machines.

IoT has enhanced safety of workers.

IoT has enabled predictive maintenance equipment.

IoT in Agriculture

IoT collects and integrates data of different parameters that impact agriculture.



IoT in Energy Management

IoT reduces electricity consumption

IoT helps in optimized energy distribution.

IoT in Vehicle to Everything Communication

How Is IoT Disrupting Other Business?

DIGITAL BUSINESS

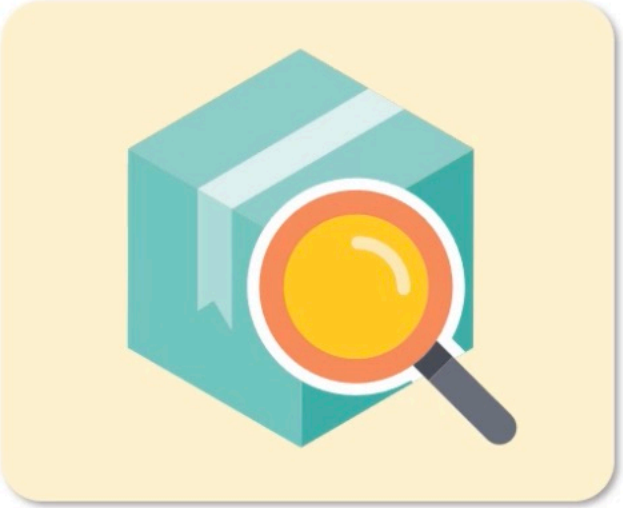
IoT: Digital Economy Leader

Nowadays, IoT is being implemented in our life, society, and the environment.

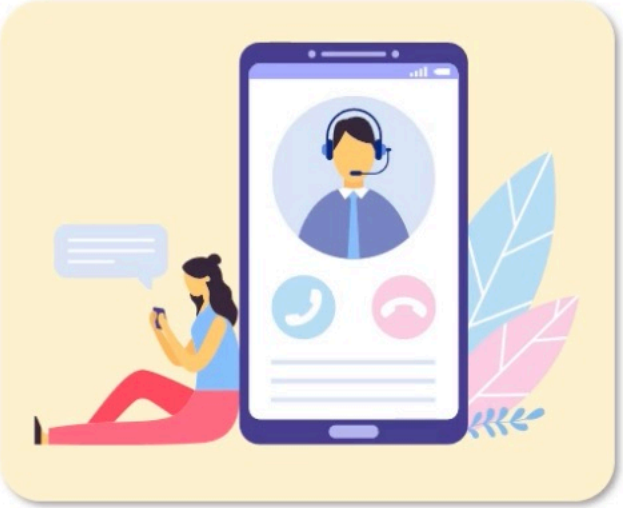
It has revolutionized our lives.

IoT: Digital Economy Leader

Businesses are using IoT-enabled smart devices.



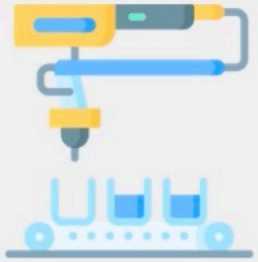
Product monitoring



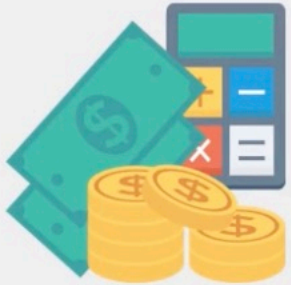
Customer support system

IoT: Digital Economy Leader

Retail



Manufacturing



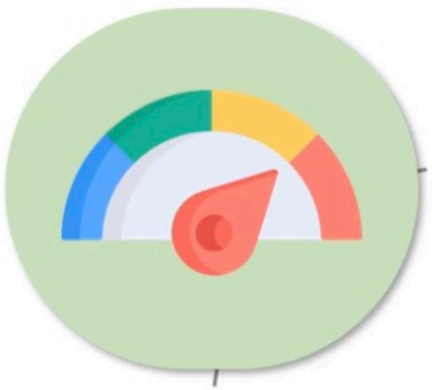
Financial Services

Advertising

Automotive

Advantages of IoT

Improves business efficiencies



Enables quick decision-making

Increases profitability

Increases productivity with lower operational costs

Challenges of IoT

Needs high-security infrastructure to avoid cyber attacks

Has a complex technological structure that is difficult to understand

Digital Disruption and Strategies for Digital Transformation

Robotics and Automation

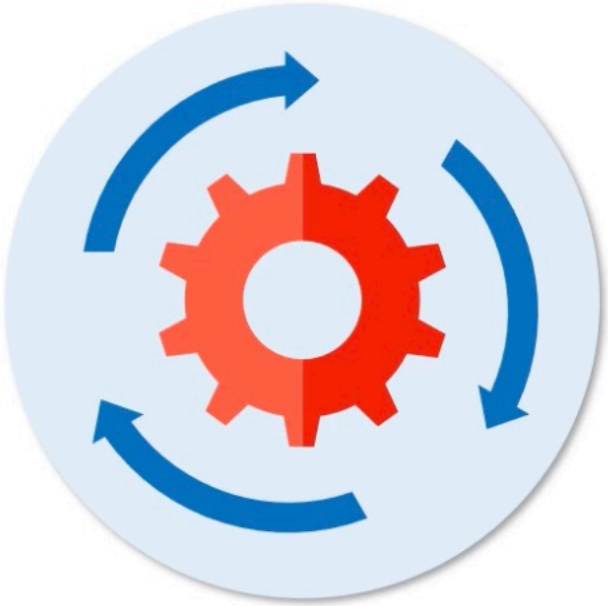
DIGITAL BUSINESS

What Is Automation?

Automation is designing objects to operate machinery and equipment with reduced human intervention.

What Is Automation?

Its goal is to save labor costs and improve operational efficiency by making the processes automatic.



Examples of Automation

It is a system to direct customers to the correct agent through multiple options.

Interactive Voice Response

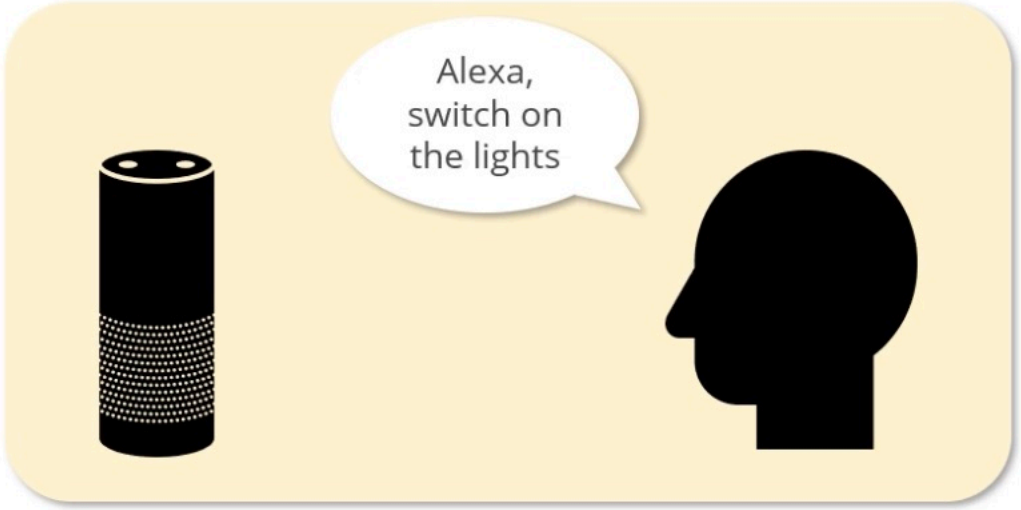
Examples of Automation

The recent development of self-driving cars are remarkable milestones in automation.

Self-Driving Car

Examples of Automation

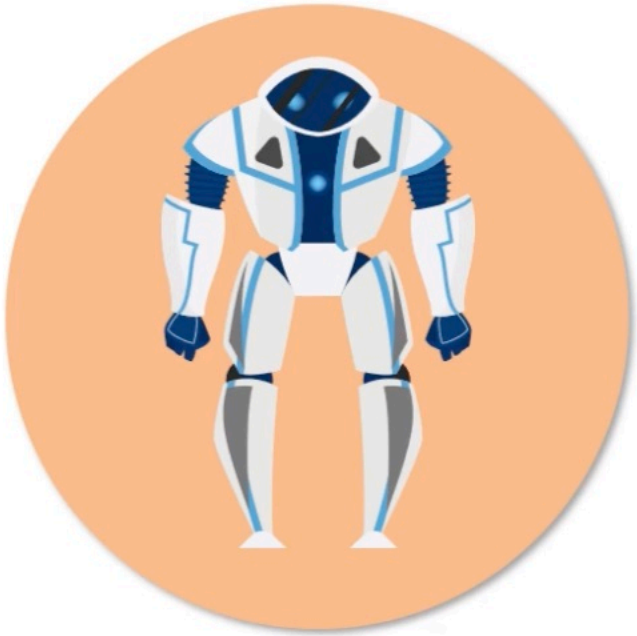
Tasks such as switching the lights on, opening the curtains, and regulating room temperature can be done from an app.



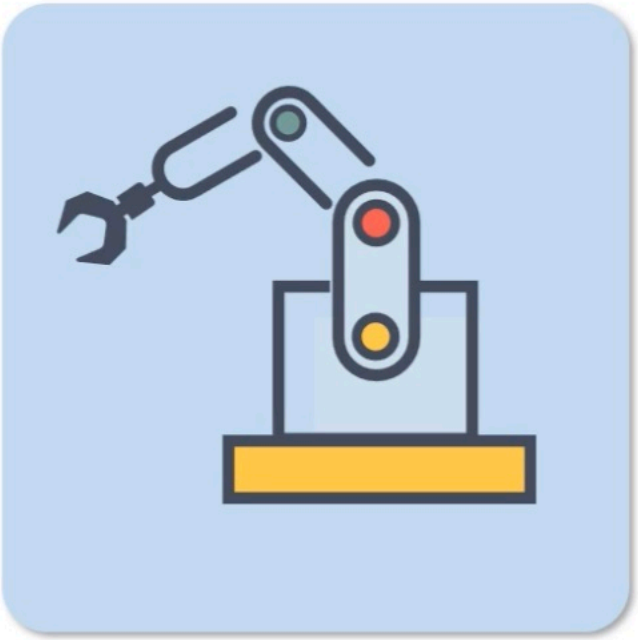
Hospitality Events Assistance

Development of Robots

Robots are programmed to do repetitive tasks performed by humans in manufacturing industries.



Advantages of Robots



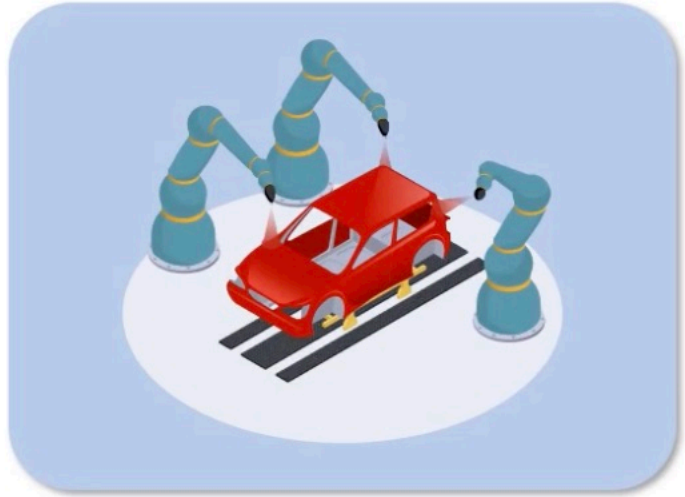
- Robots work faster than humans.
- They can work 24/7.
- This allows mass production at a very low cost.
- It’s very useful in manufacturing.

Applications of Robots

We see robots in these fields:

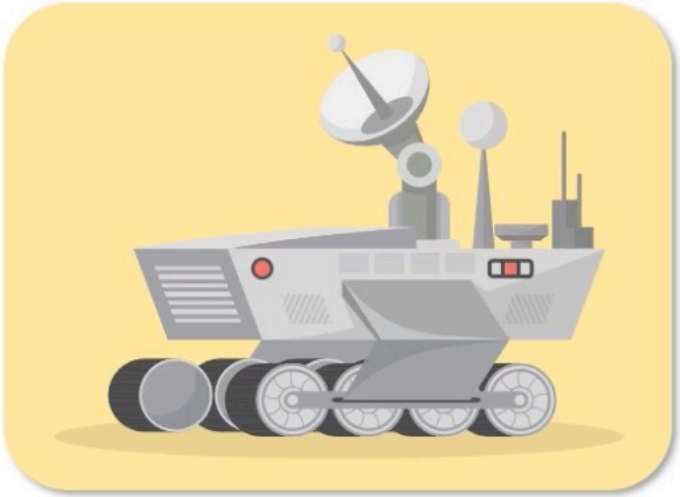
Outer Space

Defense



Manufacturing Industry

Applications of Robots



Outer Space

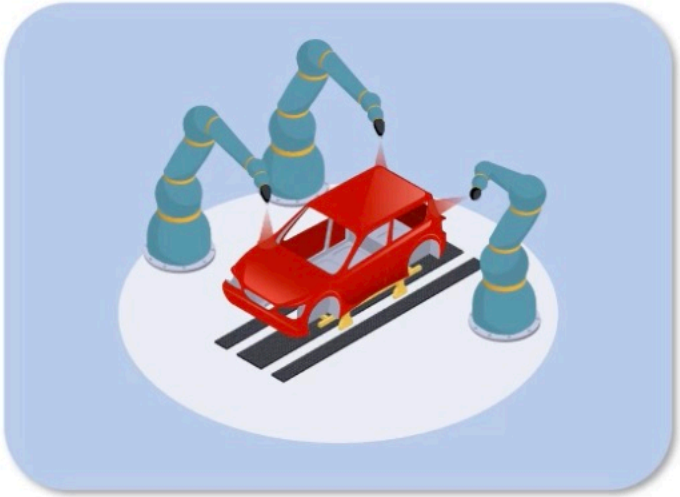
- Robots are vital for outer space exploration.
- Autonomous robotic spacecraft is used to discover celestial bodies.
- NASA uses the robot *Rover* for surface exploration on Mars.

Applications of Robots

Defense

- Many advanced robotic technologies are developed specifically for defense.
- There are extensive applications of robotics in defense such as predator drones, crewless bomb detection vehicles, and gun-mounted robots.

Applications of Robots



Manufacturing Industry

- Ever since the industrial revolution, robotics and automation have been an integral part of manufacturing.
- Robotic arms can be used in a variety of tasks such as welding, cutting, lifting, and bending metals.

Impact of Robotics and Automation on Various Industries - Part I

DIGITAL BUSINESS

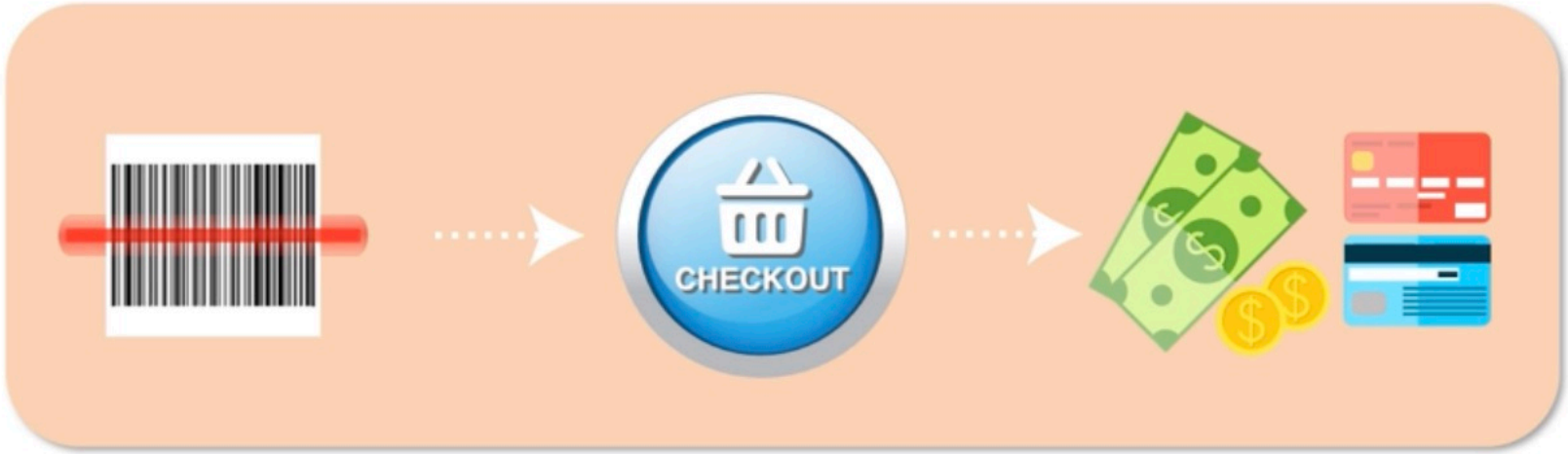
Retail Markets

Supermarkets have introduced self-checkout payment systems.

Retail Markets

Self-Checkout System

Retail Markets



Retail Markets

- The workflow in retail industry is influenced by automation.
- Various manual processes can be done through automation, which saves time and workforce.

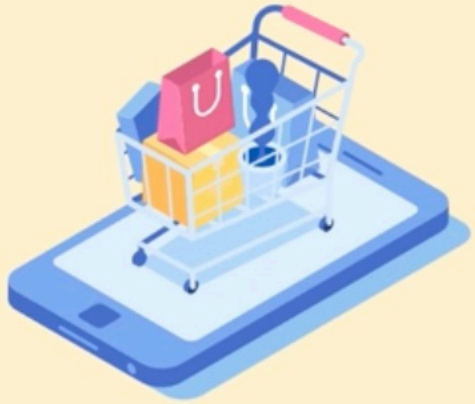
Examples of Automation

Message

Discount

E-Commerce

Online shopping has made it convenient to purchase from laptops or mobile devices.



E-Commerce

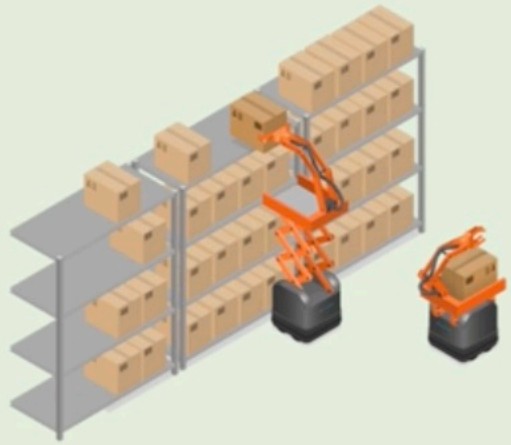
E-Commerce

- Amazon is the world's biggest retail company.
- Amazon products' prices get automatically changed for a predetermined period when there is a sale.

Logistics

Automated warehouse robots carry items from one location to another.

Logistics



Automated warehouse robots

This change in logistics spares a tremendous amount of human resources.

Logistics

This change leads to cost-saving along with less human power involvement.

Some things are completely automated in logistics:

- Tracking packages
- Scanning barcode
- Verifying employee attendance
- Detecting and flagging violated safety rules

Food and Beverage

The F&B industry reduces ordering time by taking payment through touchscreen.

Food and Beverage

Payment using touchscreen

Websites and apps have made it convenient to quickly finish the ordering process.

Food and Beverage

Apps have taken the place of the traditional hearing and believing method to find a good restaurant.

Food and Beverage

Impact of Robotics and Automation on Various Industries - Part II

DIGITAL BUSINESS

Video Surveillance

Automated video surveillance systems monitor movement in an area.

It provides easy tracking, security, and safety.

Home Automation Systems

Automated home appliances collect data and provide maintenance services.

Home Automation Systems

Waste Management

Municipalities use hydraulic systems to unload trash cans into garbage trucks.

Industrial Robotics

These repetitive tasks are automated using robots:

- Welding
- Assembling
- Painting
- Packing
- Machining
- Material handling

Business Process Automation

In service industries, the data entry is manually performed daily which results in substantial labor costs.

Business Process Automation

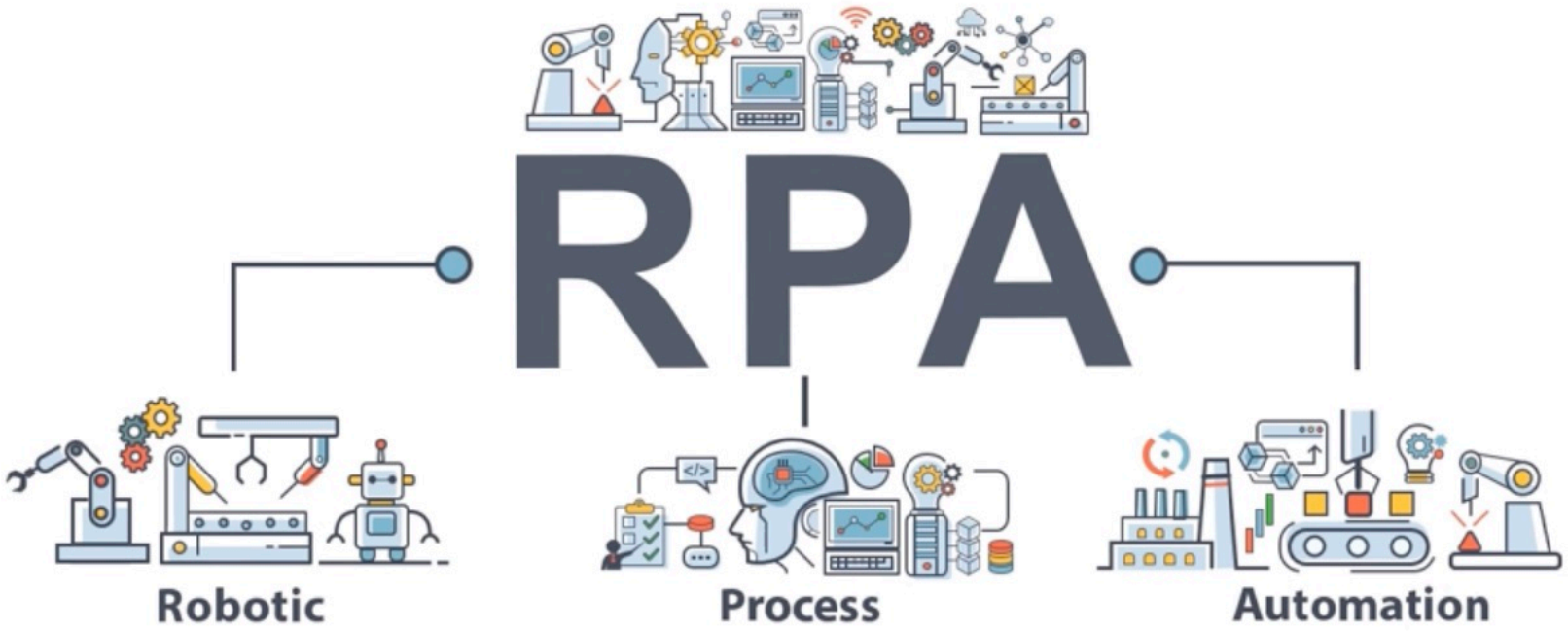
RPA automates these daily and repetitive tasks by using artificial intelligence.

Impact of RPA on the Service Industry

DIGITAL BUSINESS

What Is RPA?

Robotic Process Automation or RPA is the software to perform repetitive tasks of an organization's departmental processes such as order entry, reconciliation, and employees' onboarding.



Purpose of RPA

RPA is used in service industries to automate routine activities.

This saves substantial labor costs and increases operational efficiency.

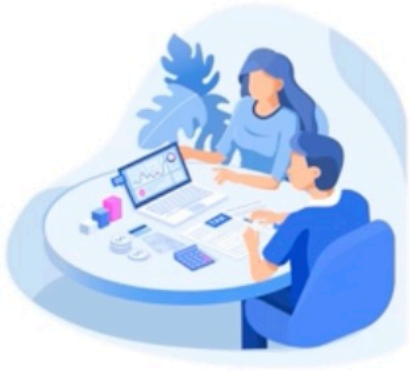
It also minimizes complications and leads to a sustainable chain of process.

Applications of RPA

Banking and Finance

Insurance

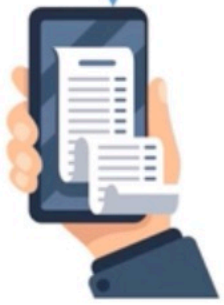
Healthcare



Pharma

Financial Consulting

Banking and Finance



Bank Balance

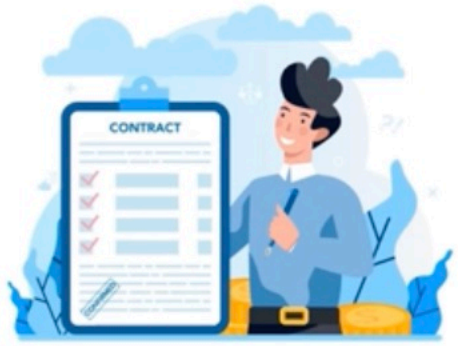
Loans

Offers

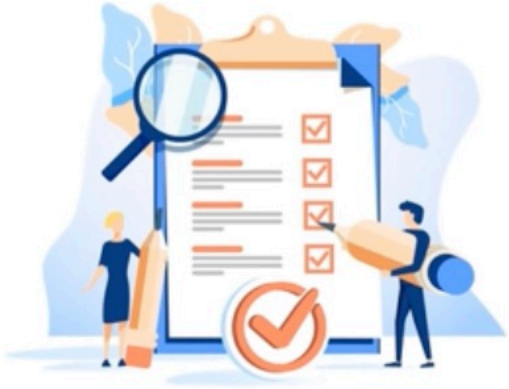
Banking and Finance

Insurance

Policy Administration



Underwriting

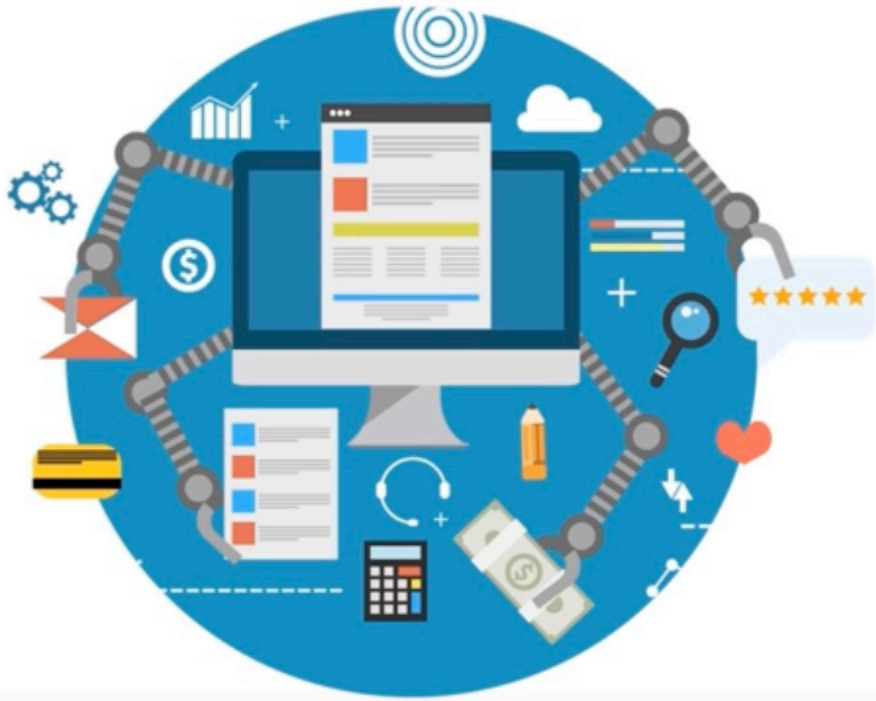


Claims

Fraud Detection

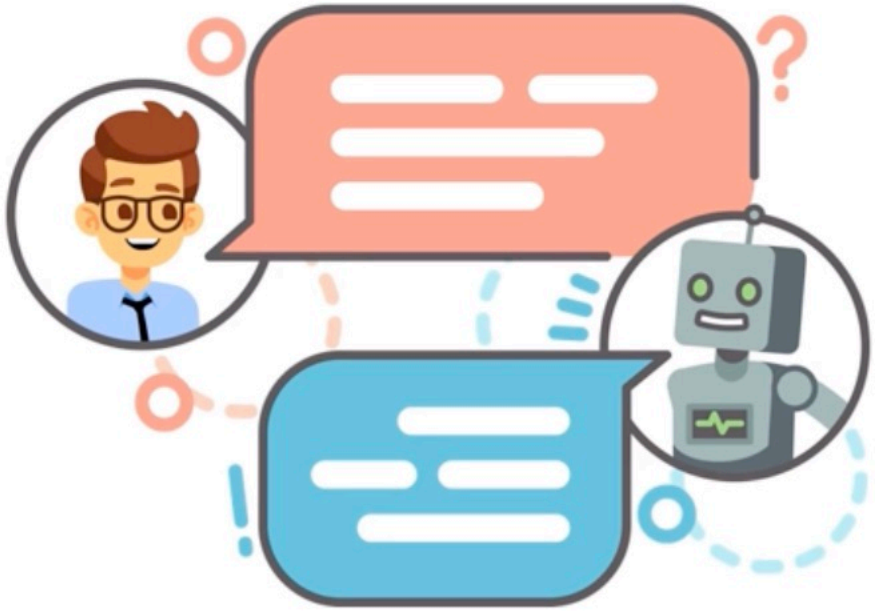
Insurance

Application processing time for hundred applications has been reduced from three hours to three minutes.



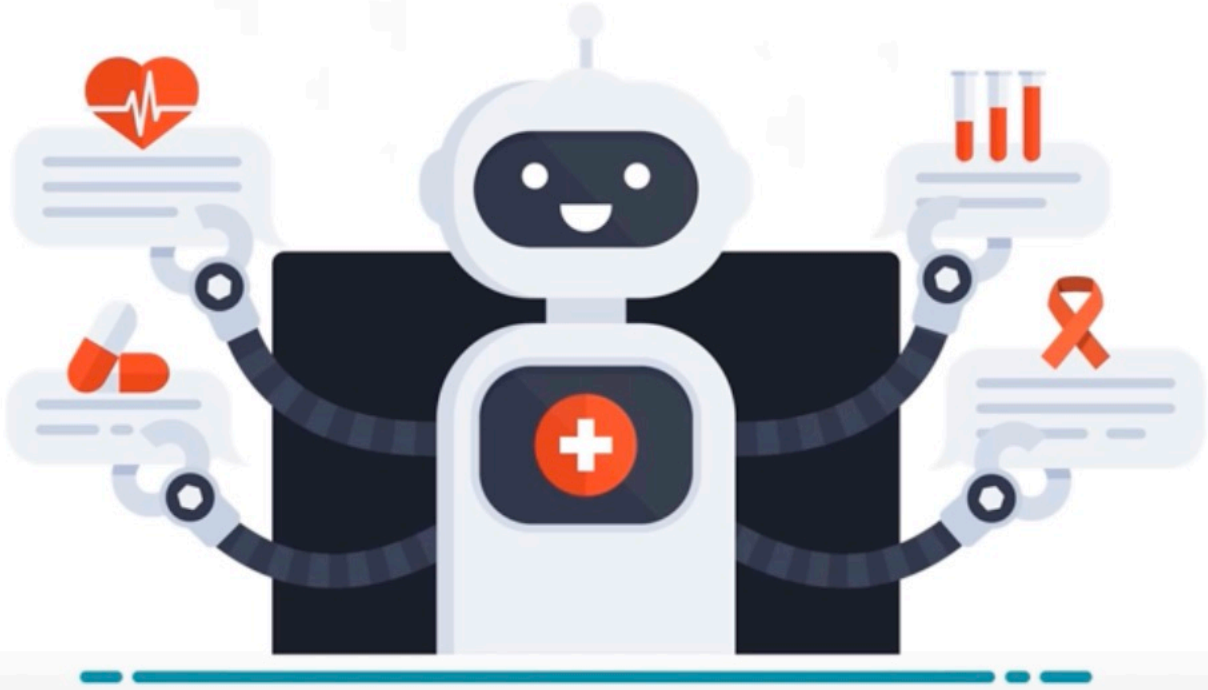
Insurance

Chatbot agents used in company websites and apps provide correct information, thereby eliminating human intervention.



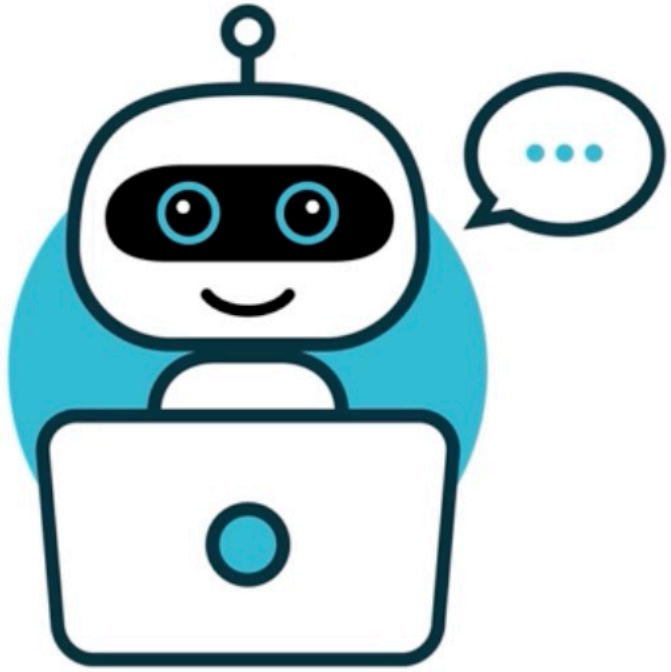
Healthcare

RPAs are used in hospital process management to automate the entry of patient information using chatbots and OCR tools.



Pharma

RPA is used to address issues, regulatory requirements, meet patient expectations, and reduce costs.



Financial Consulting

RPA is used in operations, taxation, auditing, and HR departments in retail companies.

It is also used to automate the data into a standard format accepted by the target application, thereby saving time.

Consulting firms streamline their client's financial records and other such priority content into an acceptable and helpful format for future use.

Examples: KPMG, PwC, Deloitte, and EY.

Leverage RPA in Digital Transformation

RPA can be leveraged in two key areas.

Revenue Enhancement

Cost Containment

Revenue Enhancement

amazon

- Leverages robotics to deliver products
- Creates new business opportunities

Cost Containment

- RPA can be used to cut down cost.
- RPA tools are used for process automation.
- Example: Warehouse management

Digital Disruption and Strategies for Digital Transformation

Cloud and DevOps

DIGITAL BUSINESS

Introduction to Cloud and DevOps

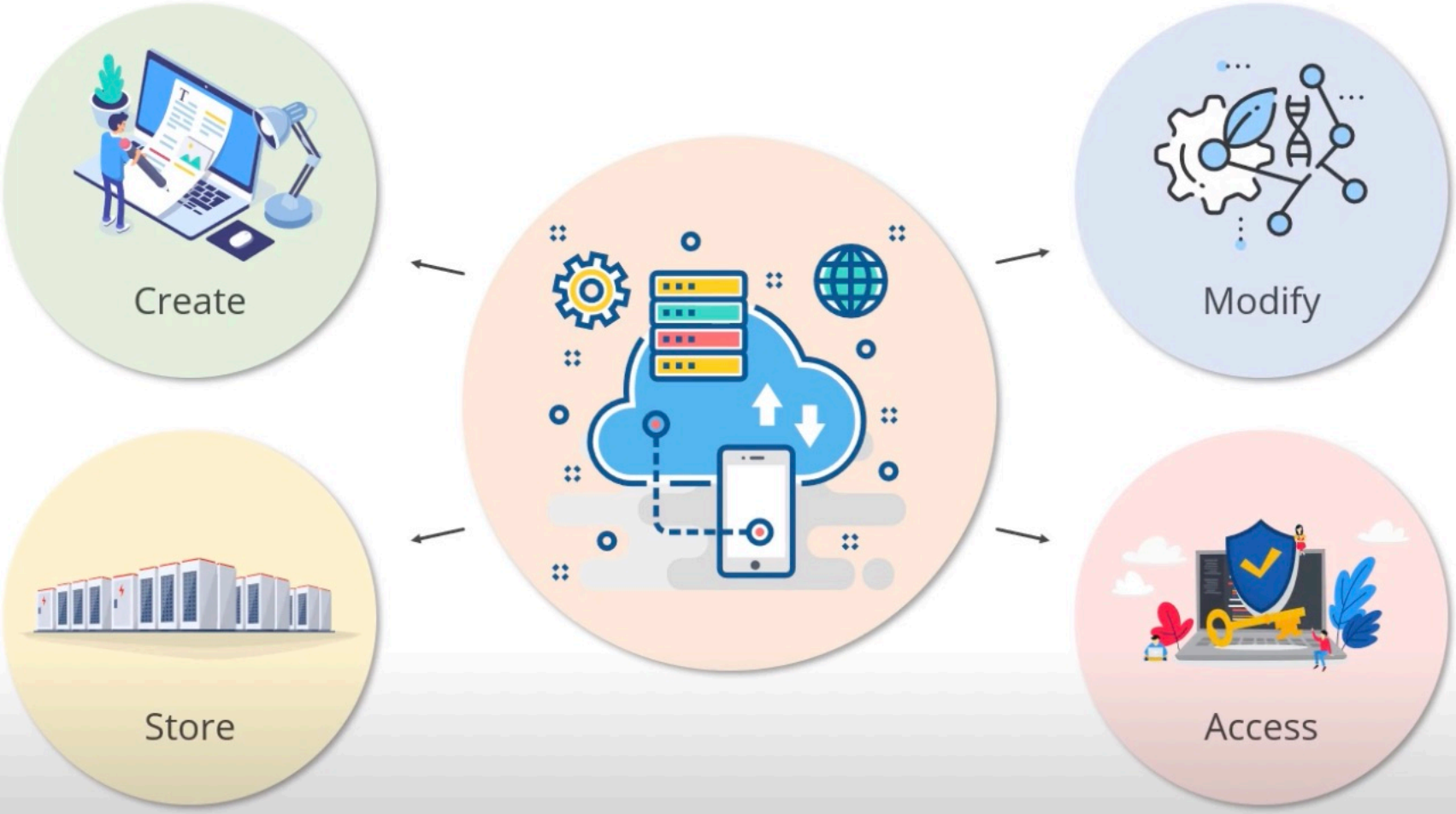
The key technologies that are disrupting the software landscape are:

Cloud Computing

DevOps

Cloud Computing

Cloud computing is a technology used to:



Cloud Computing

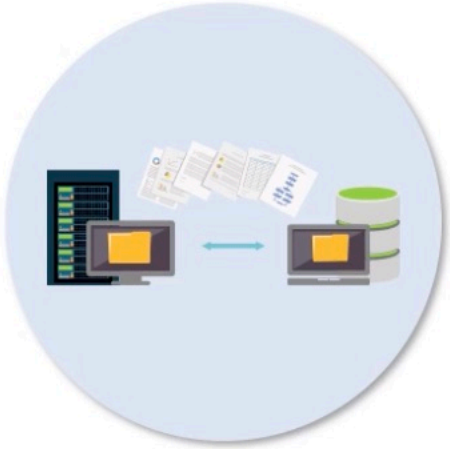
Google Cloud is a public cloud infrastructure used to access applications on the cloud.

Google Cloud

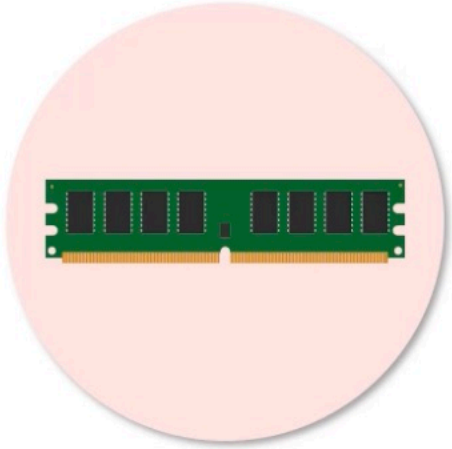
Cloud Computing

Cloud computing shares computing resources

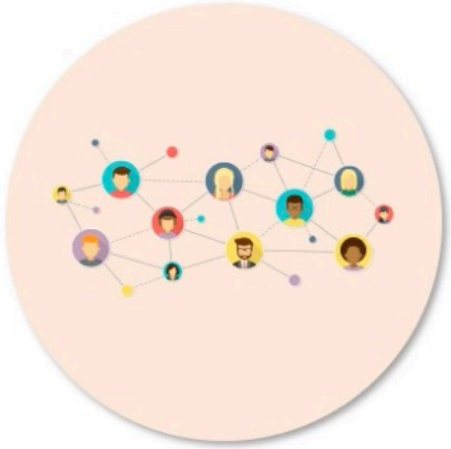
Servers



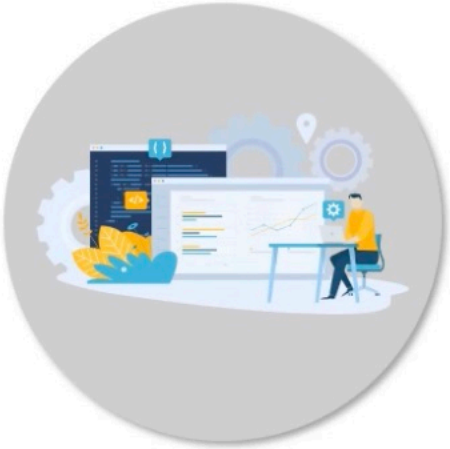
Databases



RAM

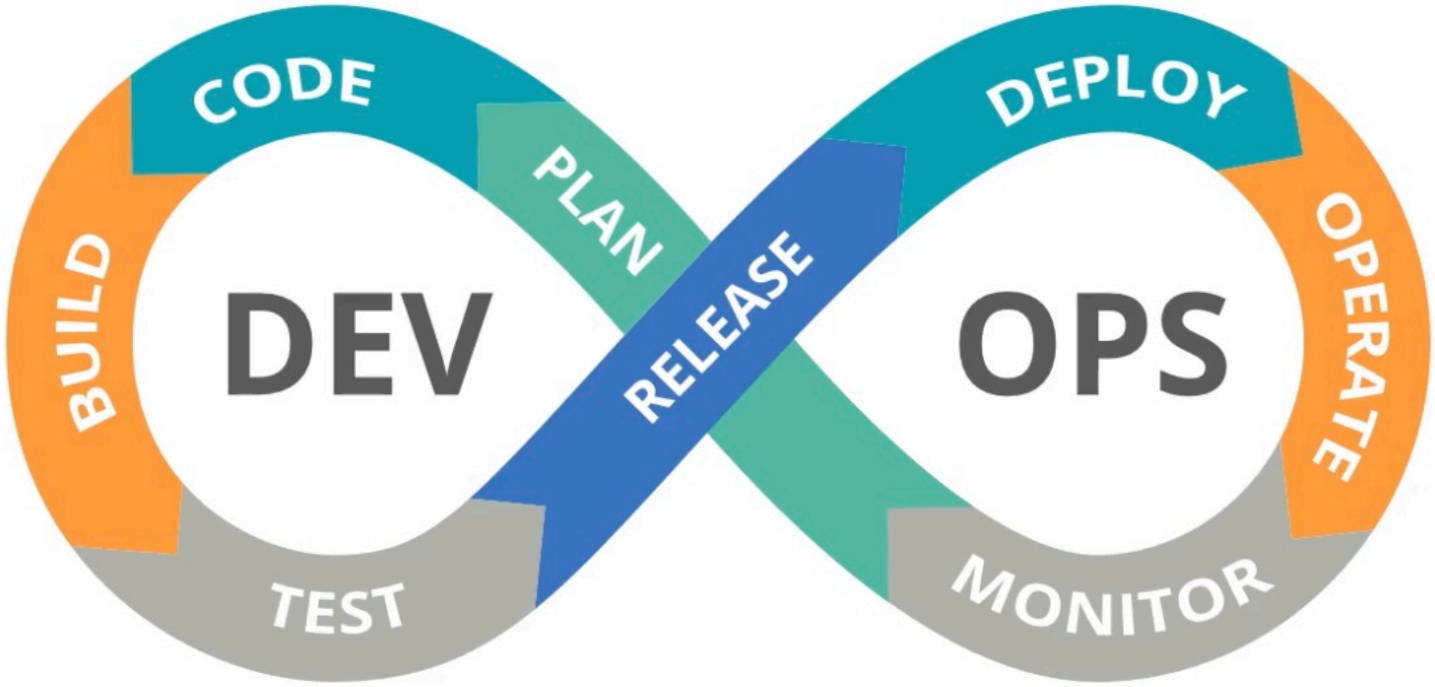


Network



Software

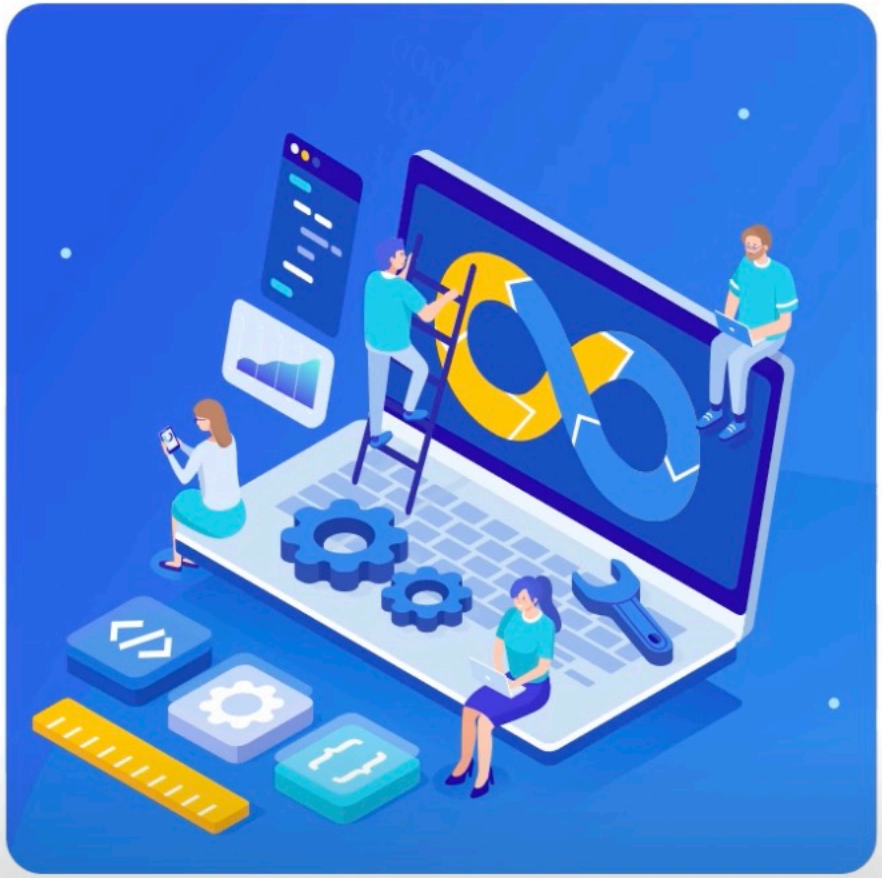
DevOps: Overview



DevOps

DevOps is a set of practices that combines

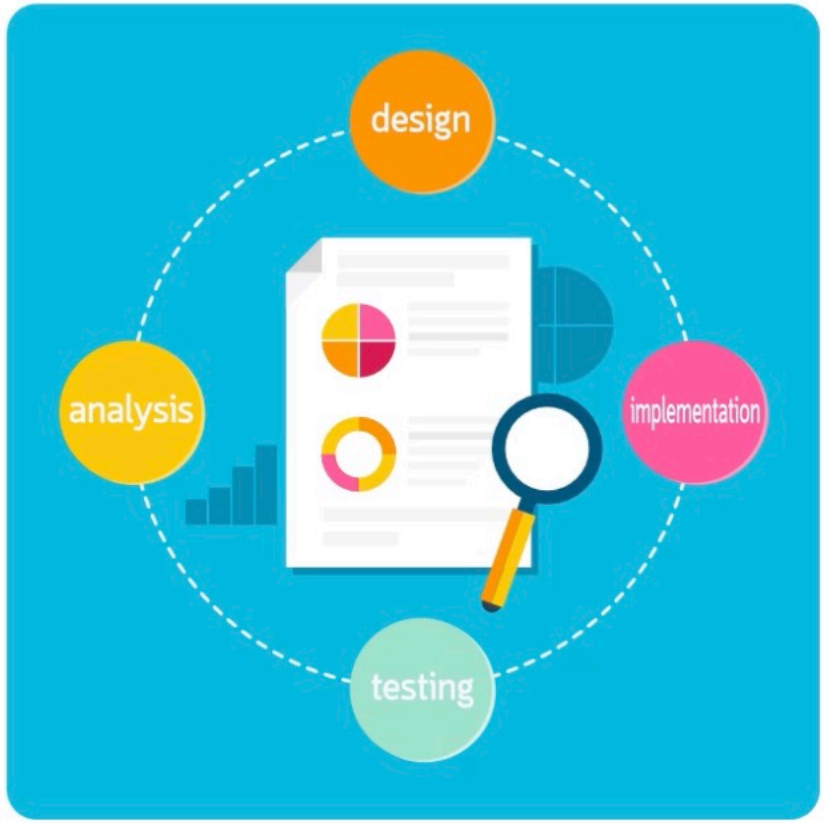
Software Development



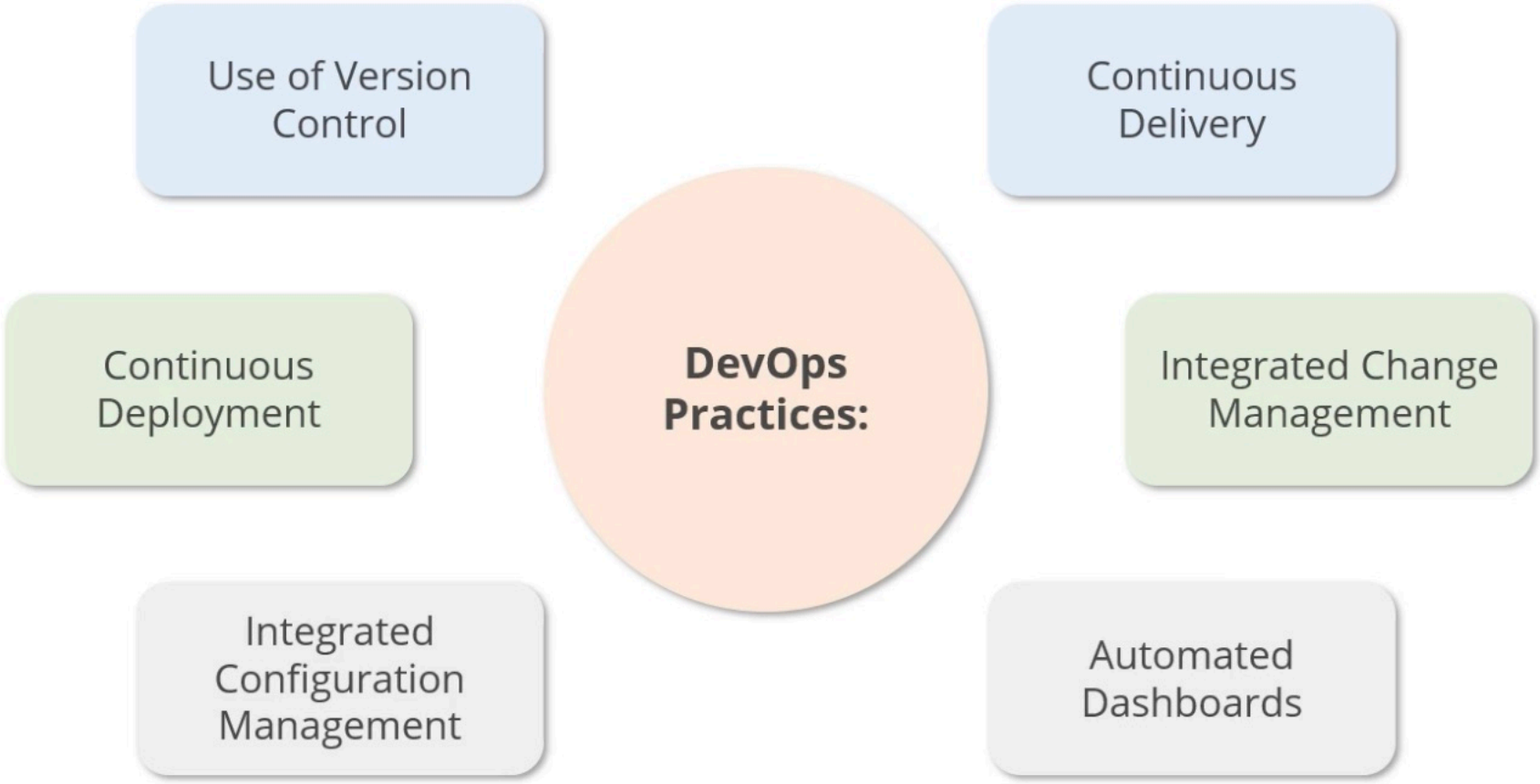
IT Operations

DevOps

Used to enable shorter software development lifecycles using best practices, processes, and tools from IT operations



DevOps


Use of Version Control
Continuous Delivery
Continuous Deployment
DevOps Practices:
Integrated Change Management
Integrated Configuration Management
Automated Dashboards

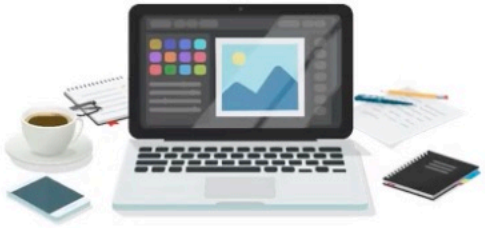
Basics of Cloud and DevOps

DIGITAL BUSINESS

Basics of Cloud Computing

Network of servers used to store and access digital information

Text



Images

Music

Video

Cloud Platforms

Popular cloud platforms:

Google Cloud

Microsoft Azure

IBM Cloud

Amazon Web Services

Cloud: Applications

Banking

Entertainment

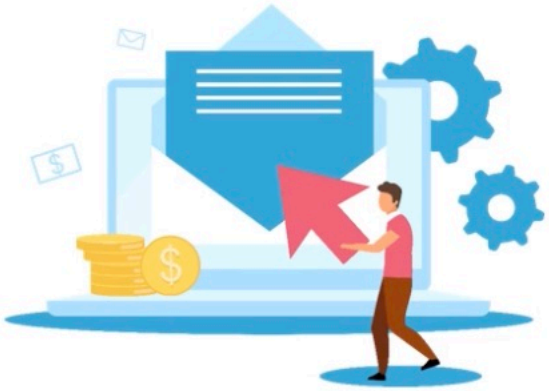
Insurance

Healthcare

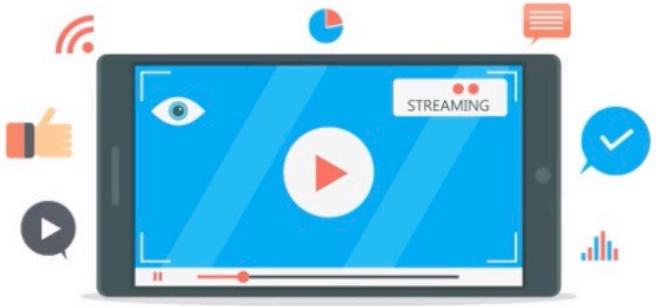
Travel

Cloud: Applications

NETFLIX

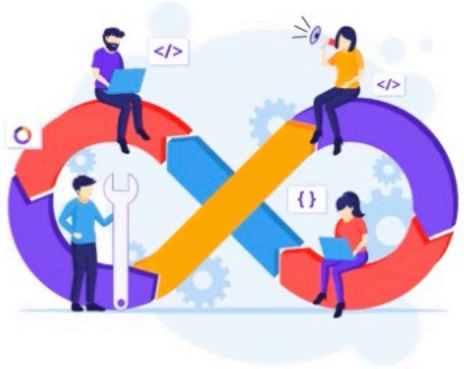


Subscription-based streaming



Online streaming

DevOps: Use



Software Product Development

Software Development Life Cycle

Win-Win

Companies Using DevOps

Companies using DevOps for building software:

Different Business Models of Cloud Computing

DIGITAL BUSINESS

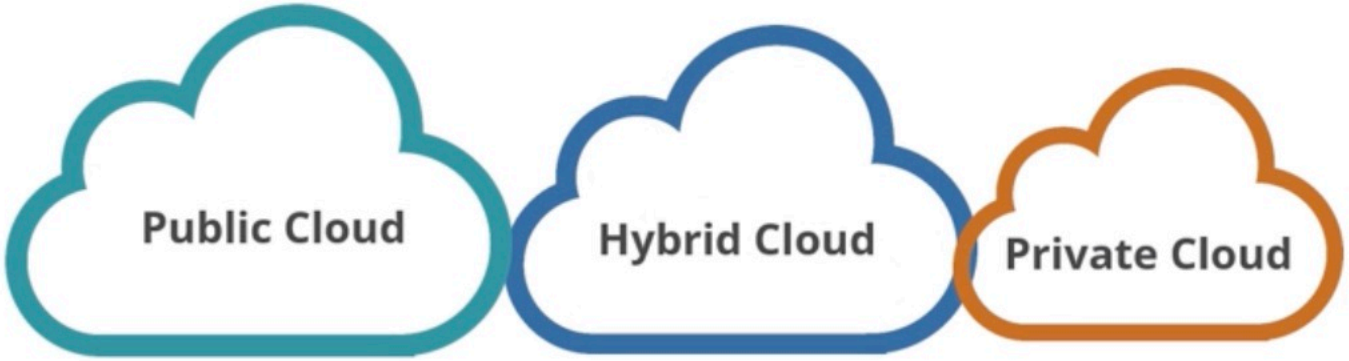
Business Models of Cloud Computing

Access

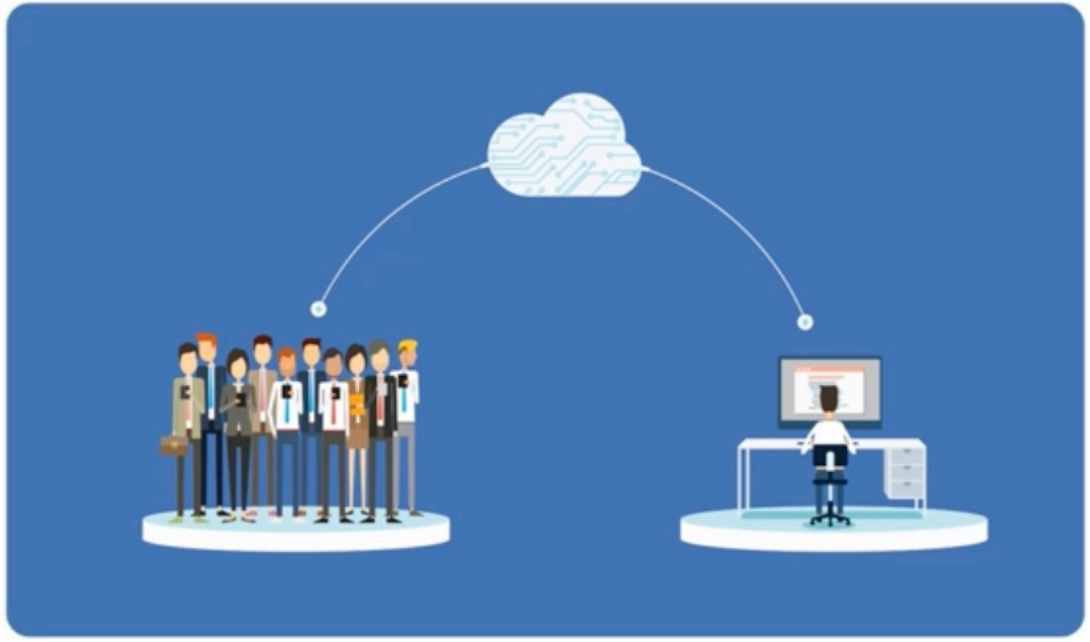
Resources

Deployment Models of Cloud Computing

Three types of deployment models:



Deployment Models of Cloud Computing



Deployment Models of Cloud Computing

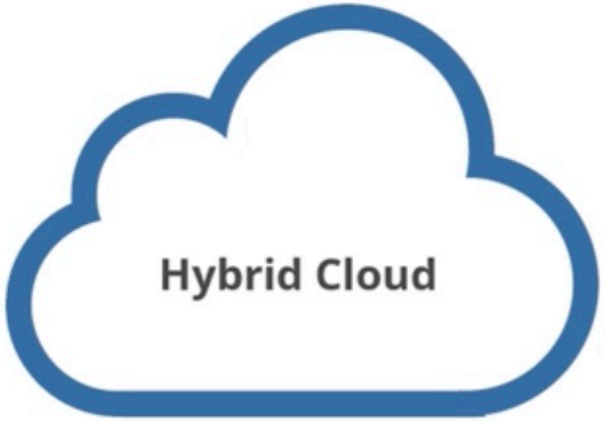
Private Cloud

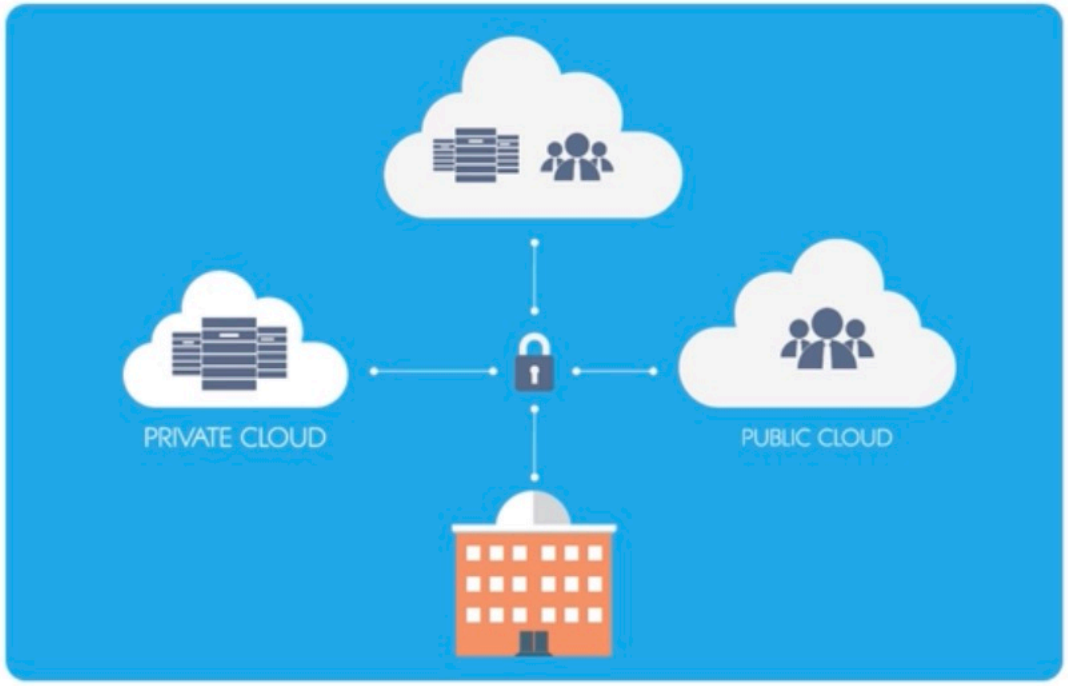
NETFLIX

Disney+ hotstar

prime

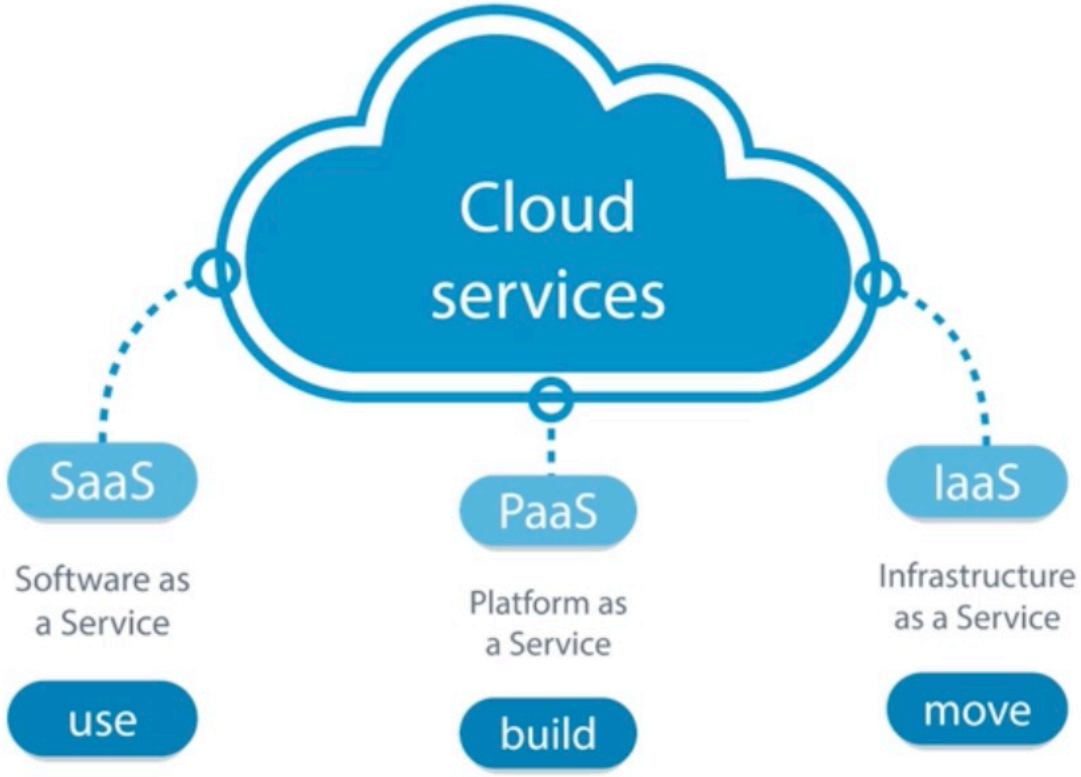
Deployment Models of Cloud Computing





Service Models of Cloud Computing

Three types of service models:

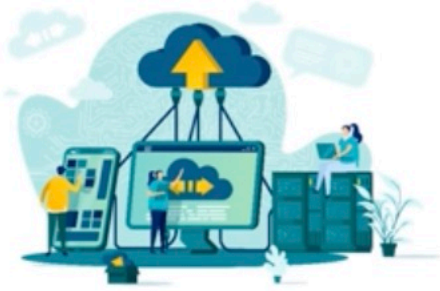


Service Models of Cloud Computing

Virtual Machines

Servers

Network



Hardware Resources

Service Models of Cloud Computing

Web Server

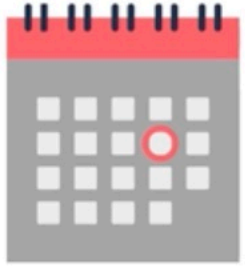
Database

Tools and
Security

Service Models of Cloud Computing

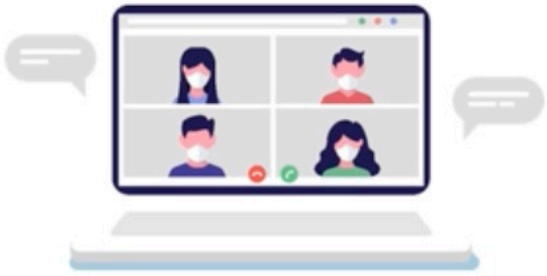
Service Models of Cloud Computing

Email



Calendars

Office Tools



Skype

CRM

Google Docs

Excel

DevOps and Its Impact on Software Development

DIGITAL BUSINESS

Impact on Software Development

DevOps brings together

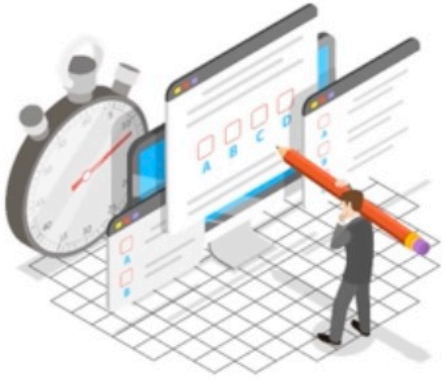
People

Processes

Technologies

Impact on Software Development

DevOps brings together



Testing

Deployment

Delivery

Impact on Software Development

It helps organizations coordinate and manage changes effectively and introduce new features in their products at the shortest possible time.

Impact on Software Development

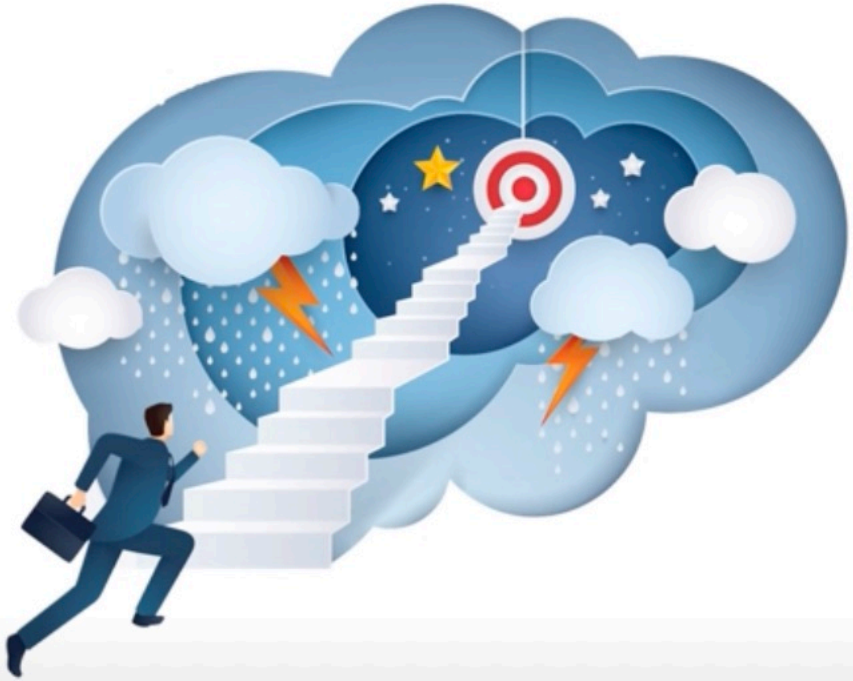
Every industry is witnessing disruption and innovation

Impact on Software Development

Companies have to remodel their digital business and use innovative features in their products.

Impact on Software Development

It helps to align the business objectives with the execution to reach the target at the least amount of time.



Cloud and DevOps Disrupting Industries

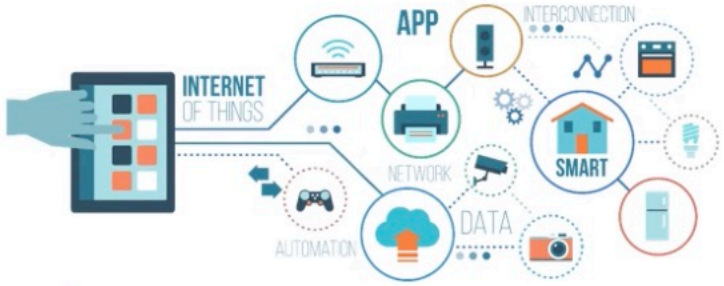
DIGITAL BUSINESS

Cloud: A Digital Disruptor

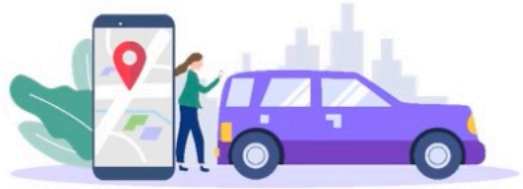
One of the most significant disruptors

Cloud: A Digital Disruptor

Industries got disrupted by Cloud



Cloud: A Digital Disruptor

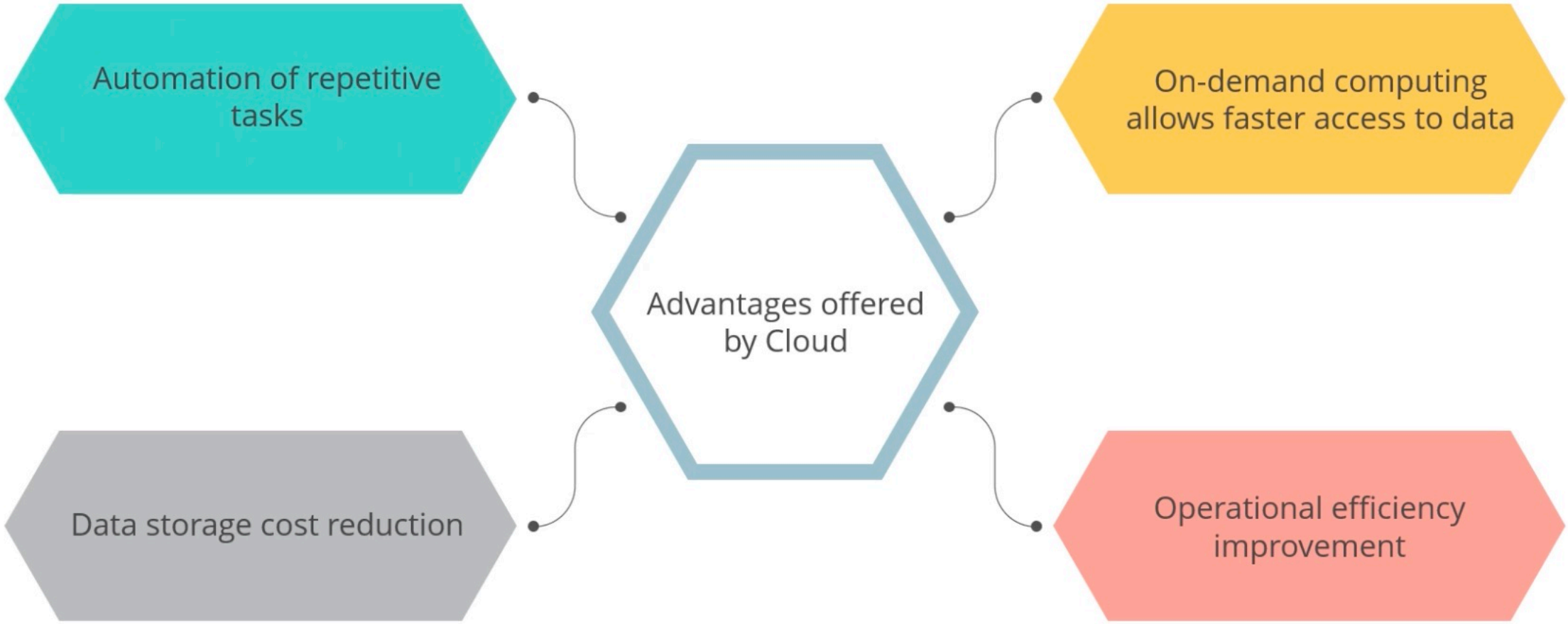


Uber and Airbnb uses disruptive cloud technologies

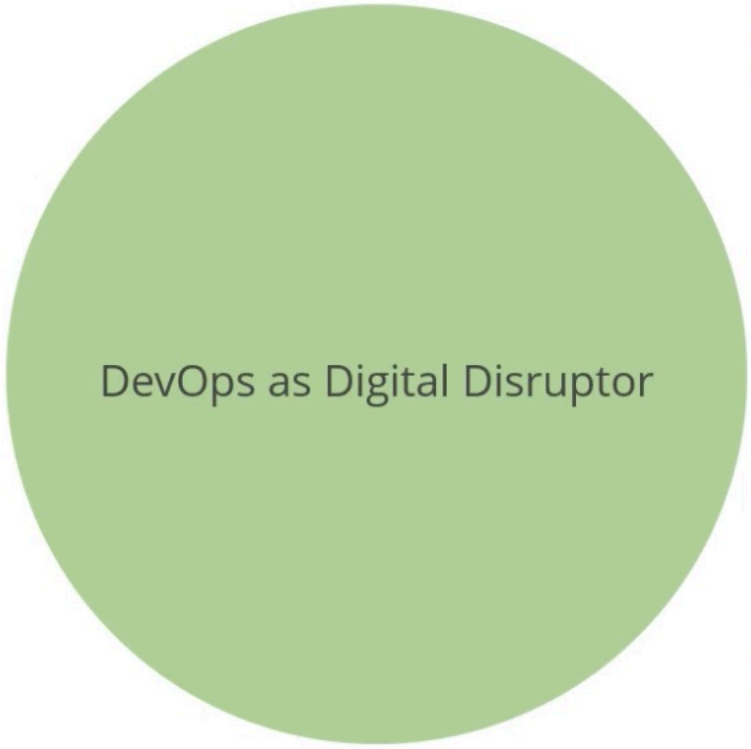
Service models allow users to develop software per their requirements.

Instead on investing money in expensive hardware, people prefer using applications available on demand.

Advantages of Cloud Computing



DevOps as Digital Disruptor



Increases automation and saves time

Increases the pace of application delivery

Provides high visibility in the workflow

Digital Disruption and Strategies for Digital Transformation

Drones

DIGITAL BUSINESS

Learning Objectives

Amazon has introduced the process of delivering packages to customers without employing humans.

amazon

Drones

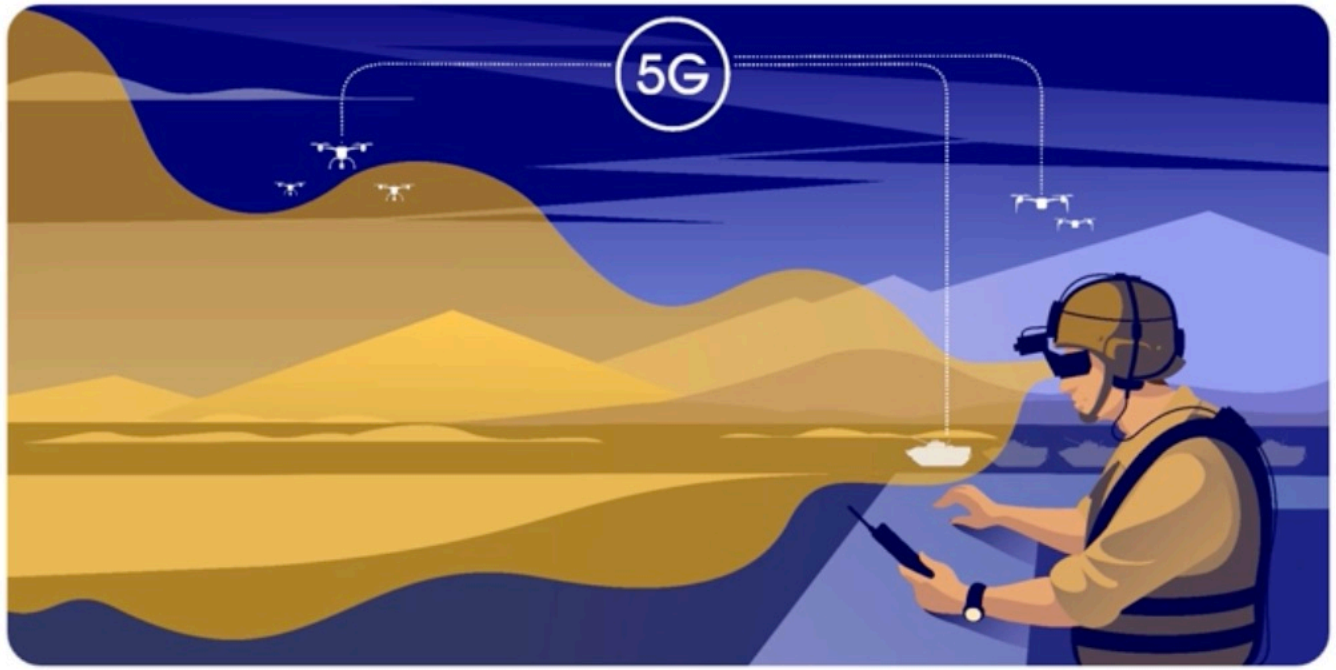
Unmanned Aerial Vehicles (UAV)

Aircrafts that operate without a pilot on board

Drones

Remotely controlled by human operators or by onboard computers

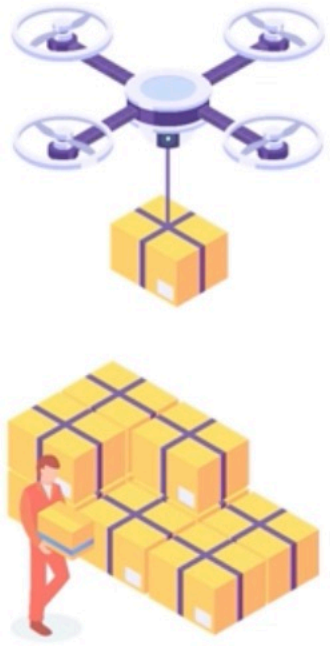
Evolution



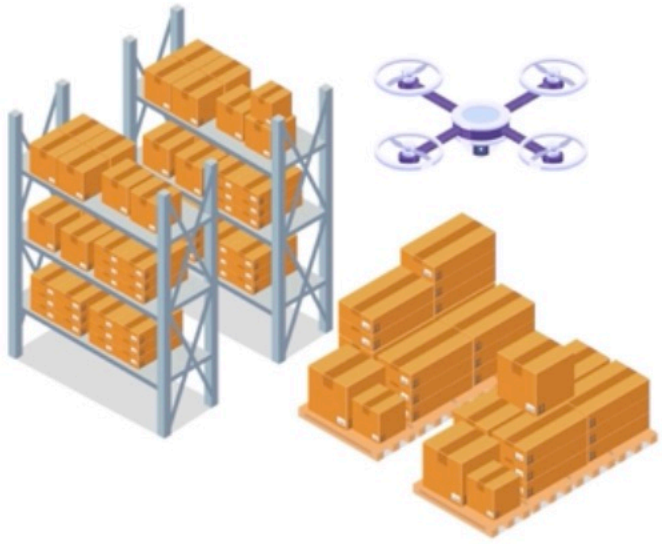
Drones were used for intelligence purposes and aerial surveillance.

Evolution

Drones are now used for various commercial activities.



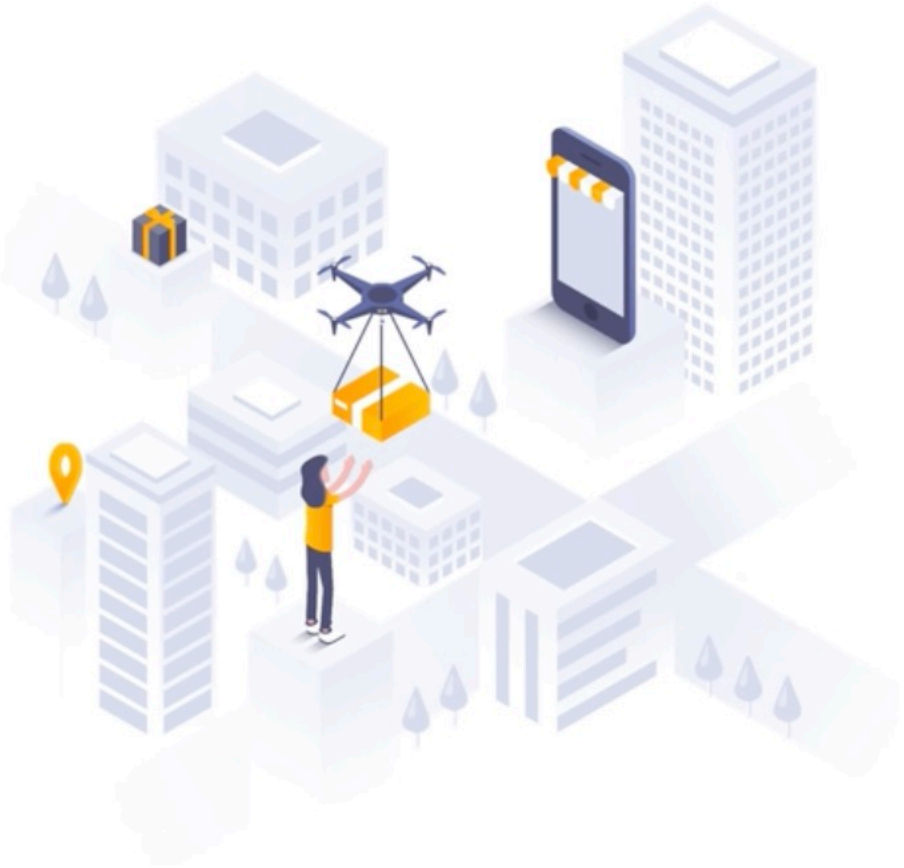
Transportation of Goods



Manning of Inventory

Delivery of Health Supplies

Drones: Applications



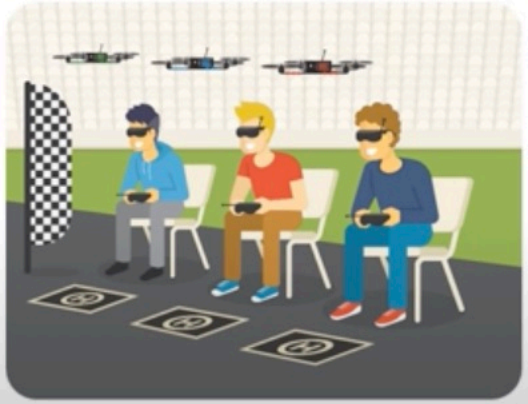
- Reduce manual labor
- Improve operational efficiency
- Generate new revenue sources

Drones: Applications

Drone technology finds wide applications.

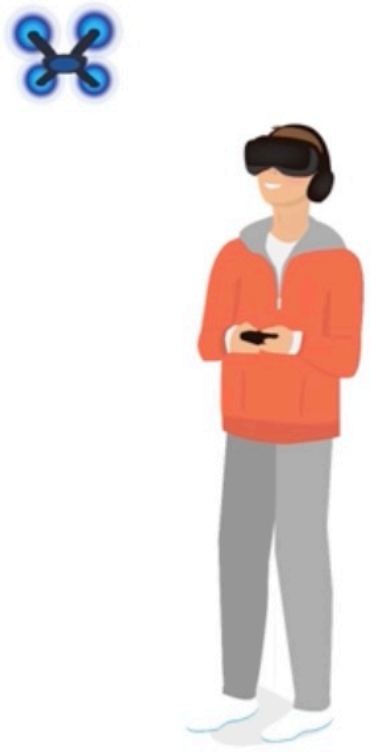
Drones: Applications

Drone technology finds wide applications.



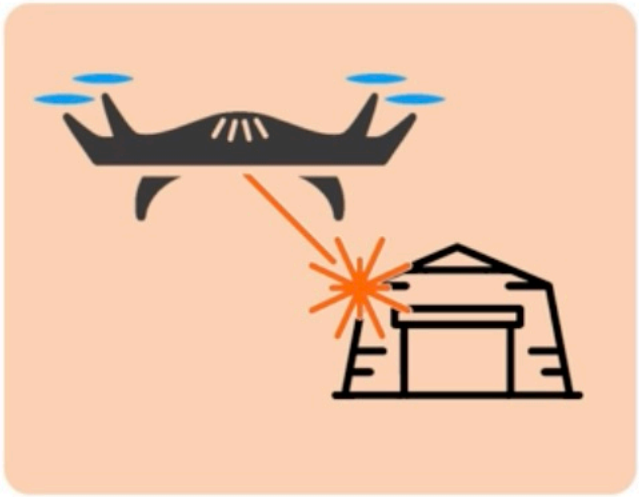
Drones: Applications

Drones are being purchased by hobbyists, tech enthusiasts, and land surveyors.

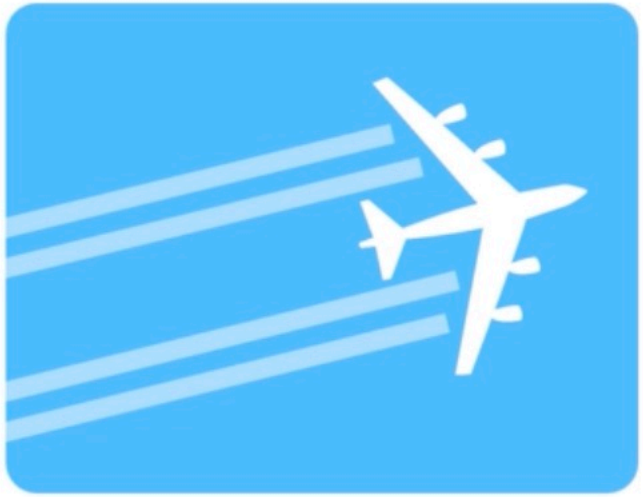


Drones: Safety

Drones can hamper safety and security of people and assets.



Target weapon depots

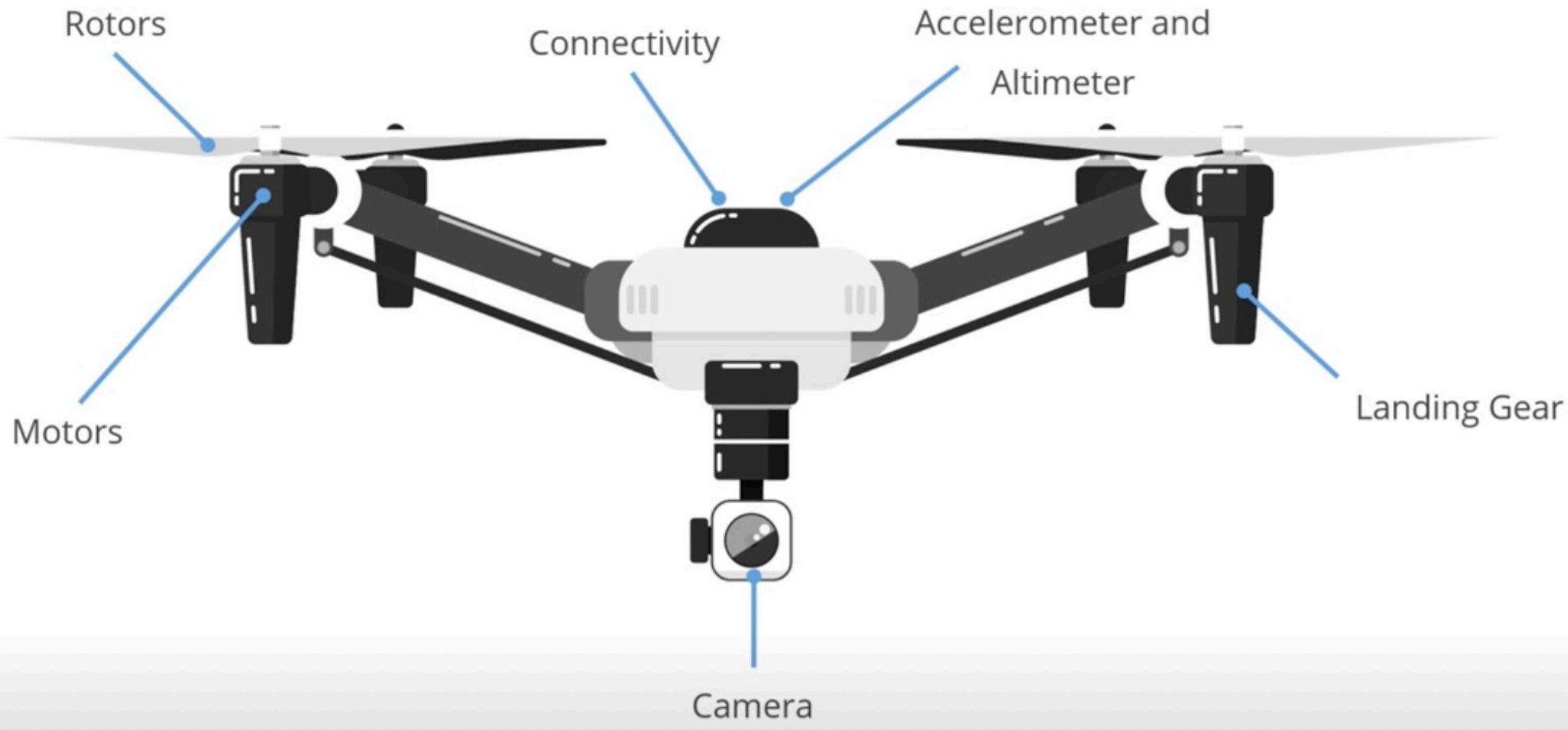


Interfere with airspace security

Basics of Drones

DIGITAL BUSINESS

Components of Drones

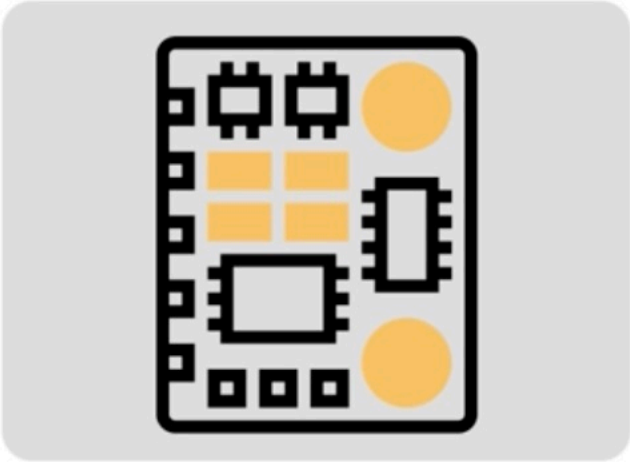


Rotors

Propellers attached to the motor

Drones change their directions by adjusting the angle of rotors.

Accelerometer and Altimeter



Accelerometer

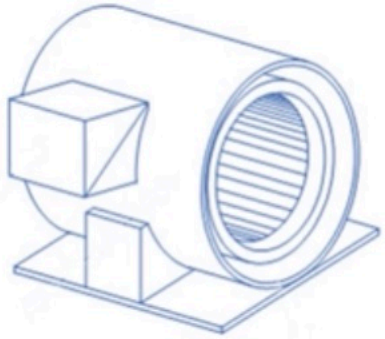
Shows the speed and direction of the drone

Altimeter

Shows the altitude of the drone

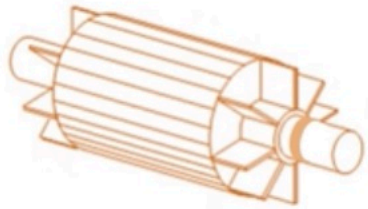
Motors

A motor has two parts, the stator and rotor.



Stator

Stationary part with windings



Rotor

Rotatory part with magnets

Source: ResearchGate

Landing Gear

Allows drones to take off and land without any damage

Cameras

In-built cameras help detect the drone's location, especially when out of sight.

Useful in search and rescue operations

Connectivity

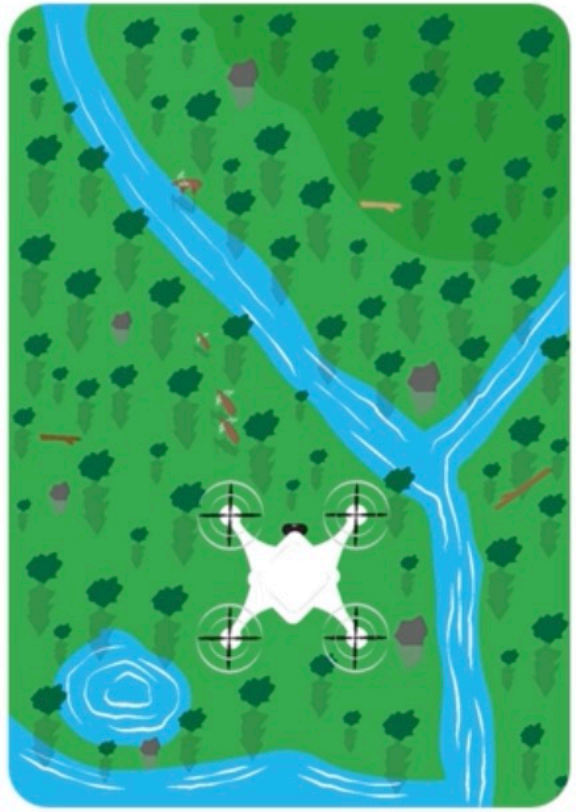
Wi-Fi Enabled

Smartphone

Helps view the drone's location

Connectivity

Good connectivity enables you to take amazing pictures.



Applications of Drones in Industries

DIGITAL BUSINESS

Drones in Agriculture

Track water use, crop health, heat signatures, and soil analysis

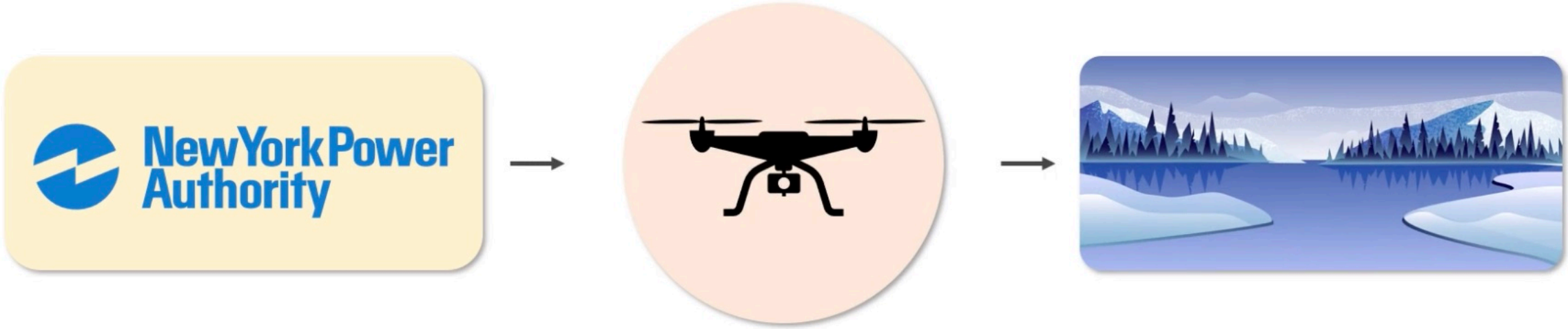
Drones in Agriculture

Help farmers increase profitability and sustainability through data-driven insights

Drones in Infrastructure

Drones in Infrastructure

Drones were used to inspect the ice boom near Lake Erie.



Drones in Infrastructure

Energy companies use drones to inspect power lines, power plants, and storm damage.

Drones in Infrastructure

SUNPOWER → →

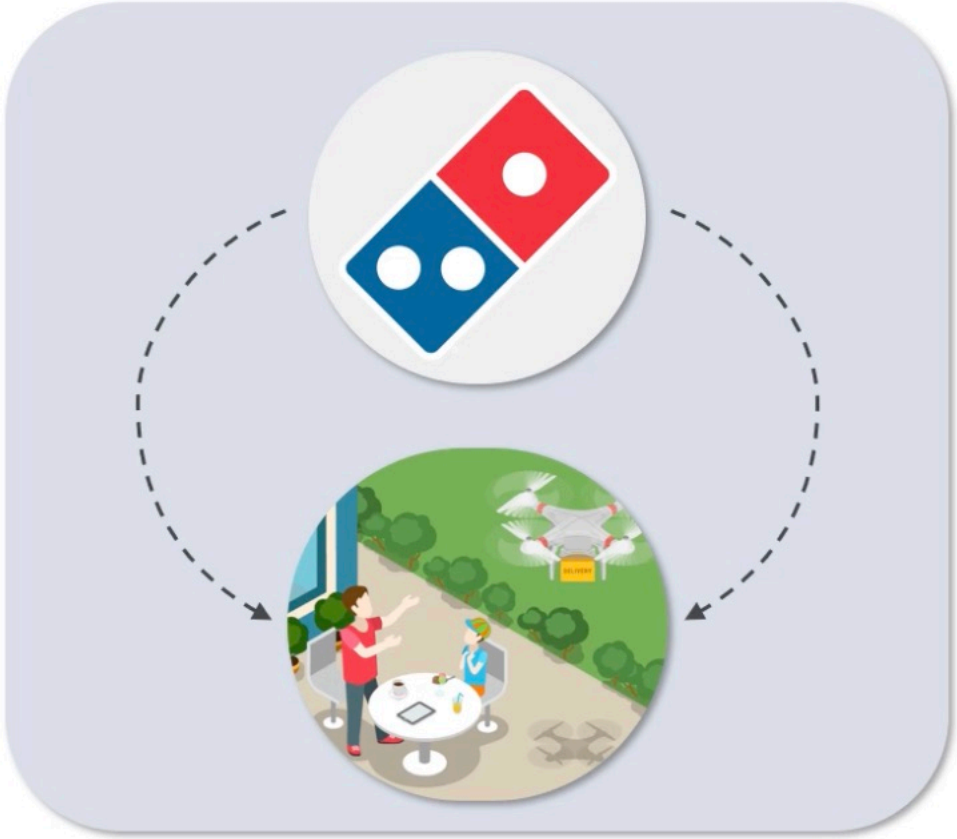
SKYSPECS → →

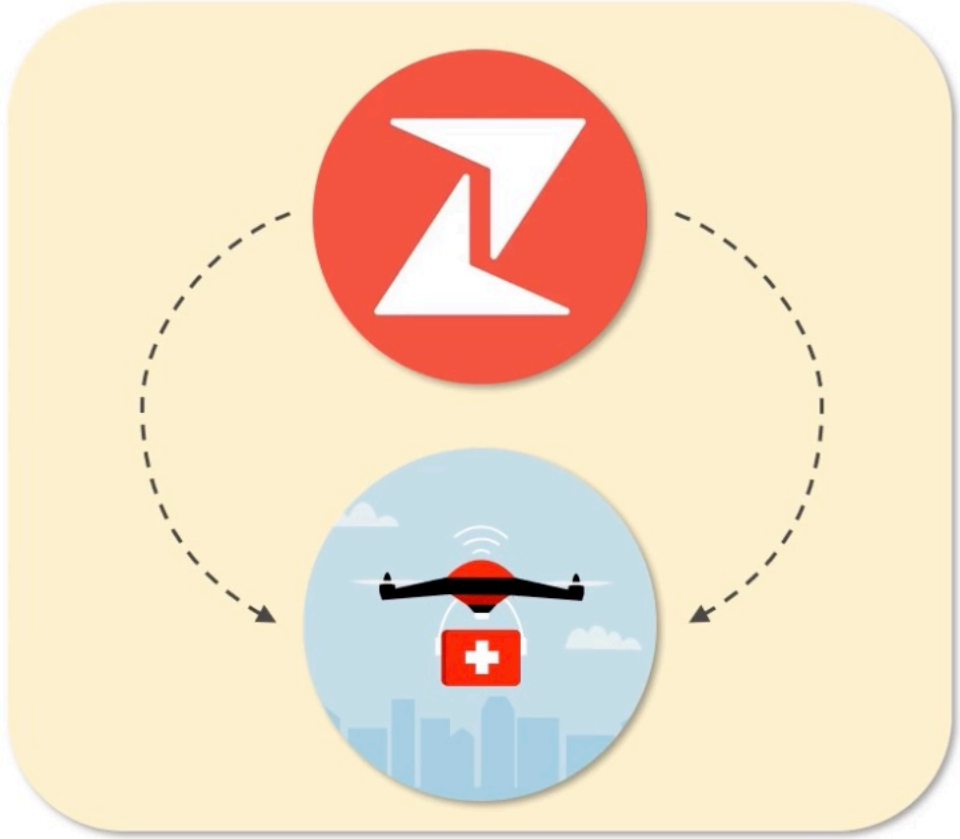
Drones in Delivery Services

Delivery by drones is faster than that by road.

Drone

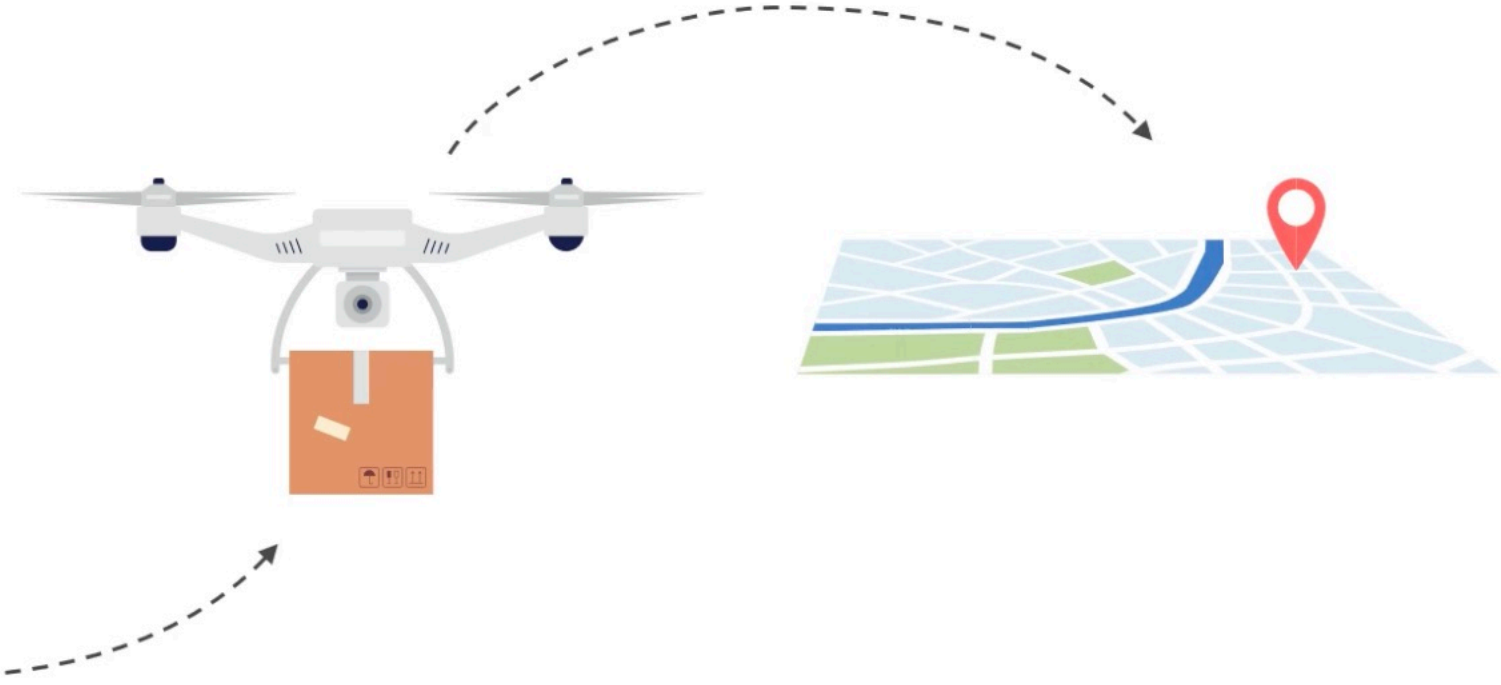
Drones in Delivery Services





Drones in Delivery Services

amazon



Applications of Drones in Logistics

DIGITAL BUSINESS

Drones in Logistics

Huge transaction volumes cannot be managed by human labor alone.
It's time-consuming and stressful.

Drones in Logistics

Drones are the preferred tools for automation of warehouses.

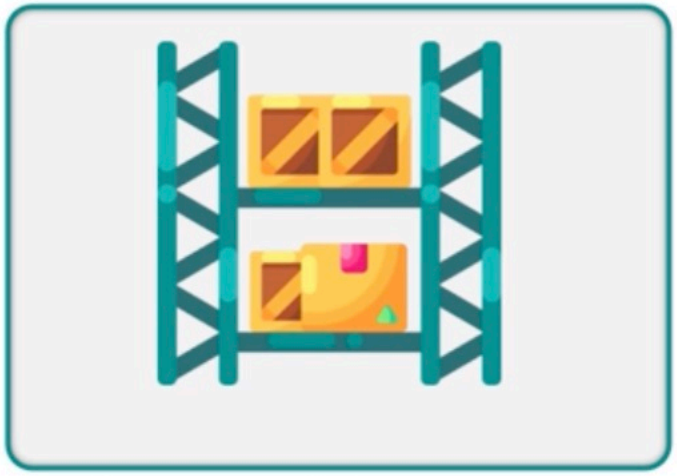
Visual-based navigators

Land at an exact location

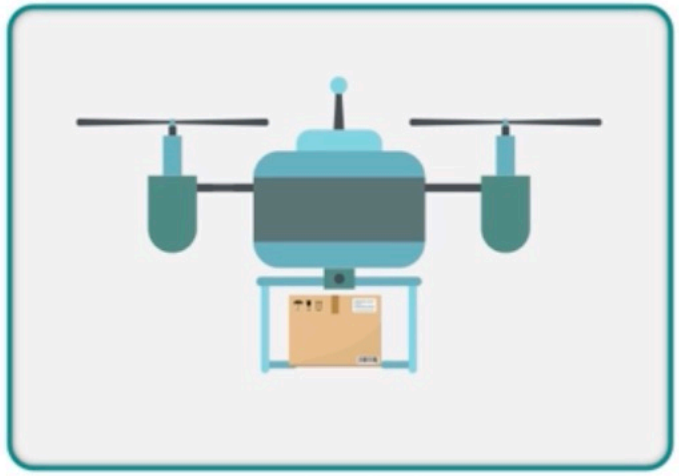
Ability to autonomously fly and hover over objects

Drones in Logistics

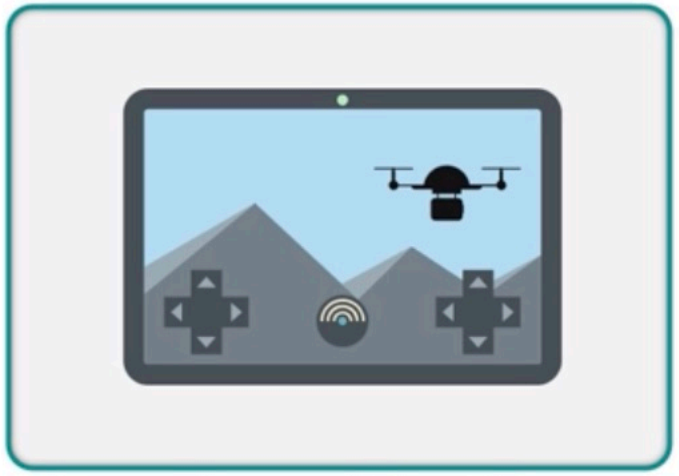
Applications of drones in warehouses:



Inventory Management



Intralogistics



Inspection and Surveillance

Inventory Management

- Cycle Counting
- Buffer Stock Maintenance
- Inventory Auditing
- Physical Stock Counting

Inventory Management

- Time-consuming
- Dangerous
- Expensive
- Tedious

Inventory Management

Drones can count the inventory by scanning the items in the warehouse and thus reduce the cycle count time.

Enhanced inventory management

Inventory Management

Drones optimize processes.

Reduce labor costs

Provide accurate inventory counts

Decrease accidents

Inventory Management

Drones in their warehouse do a full inventory check in a day.

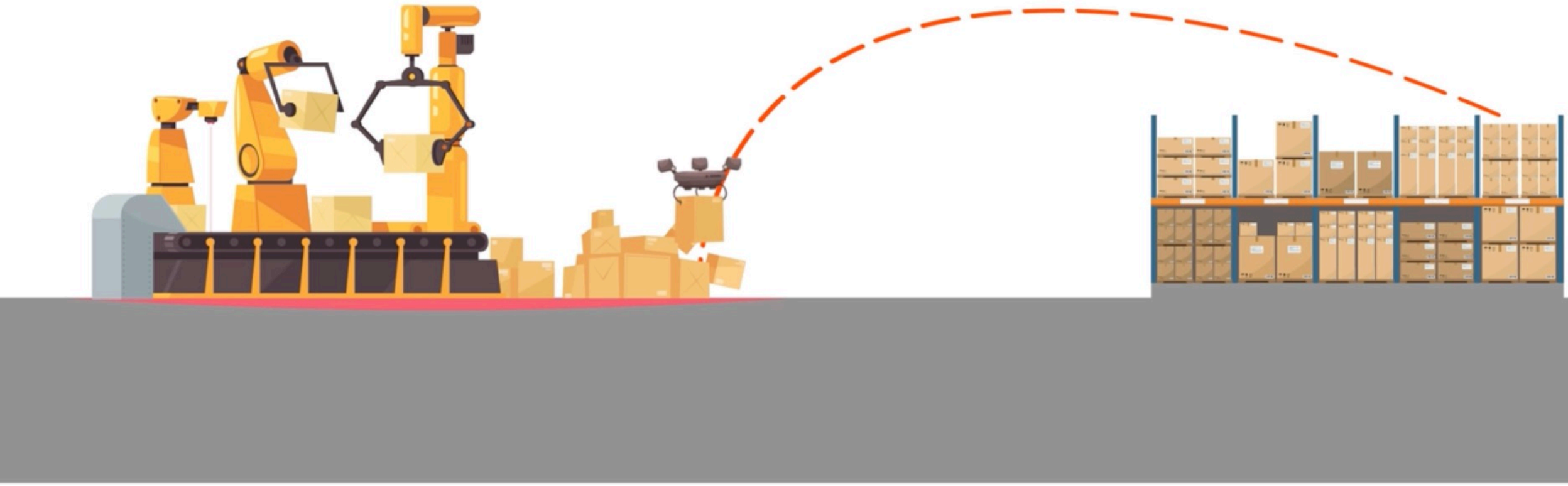
This takes a month to complete manually.

Intralogistics

Drones transport materials within the company's plants, from warehouses to manufacturing lines.

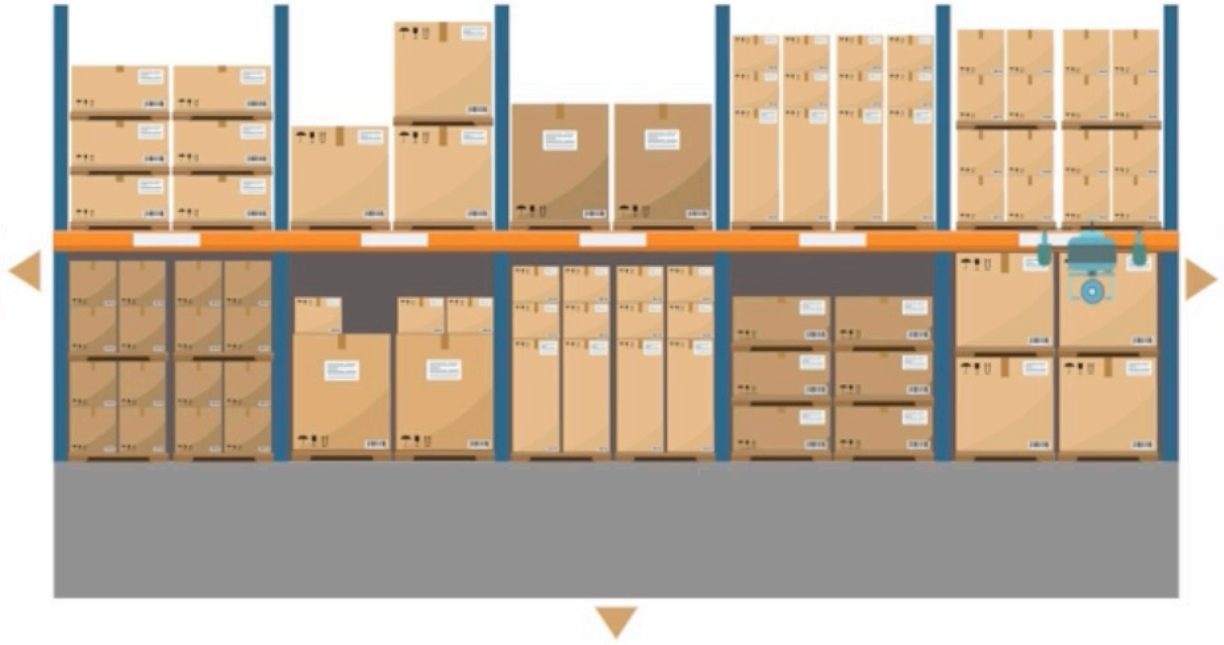
Intralogistics

Drones follow the navigation path set from one location to another while transporting materials.



Inspection and Surveillance

Inspect racks and pallet positions



Monitor high altitudes or dangerous areas

Surveillance to prevent theft or forbidden behavior

Inspection and Surveillance

Drones replace manual labor in indoor inspection and surveillance of warehouses.

Expensive and obstructs normal operations

Drones in Warehouse Management

Use Case

CORVUS ROBOTICS

Launched autonomous inventory solution

Linde Material Handling

Linde

Launched Flybox, an inventory stocktaking drone

Drones in Warehouse Management

Use Case

Flybox is connected to L-MATIC, an automated pallet stacker, which guides the drone in stocktaking.

Drones in Warehouse Management

Use Case

The drone takes photos of the pallet storage location, scans barcodes of stored goods, and transmits the information to a centralized computer server.

Digital Disruption and Strategies for Digital Transformation

Extended Reality

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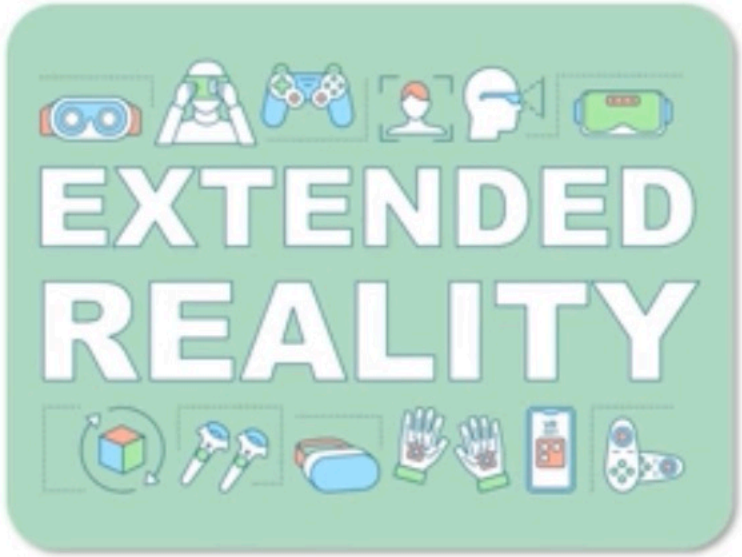
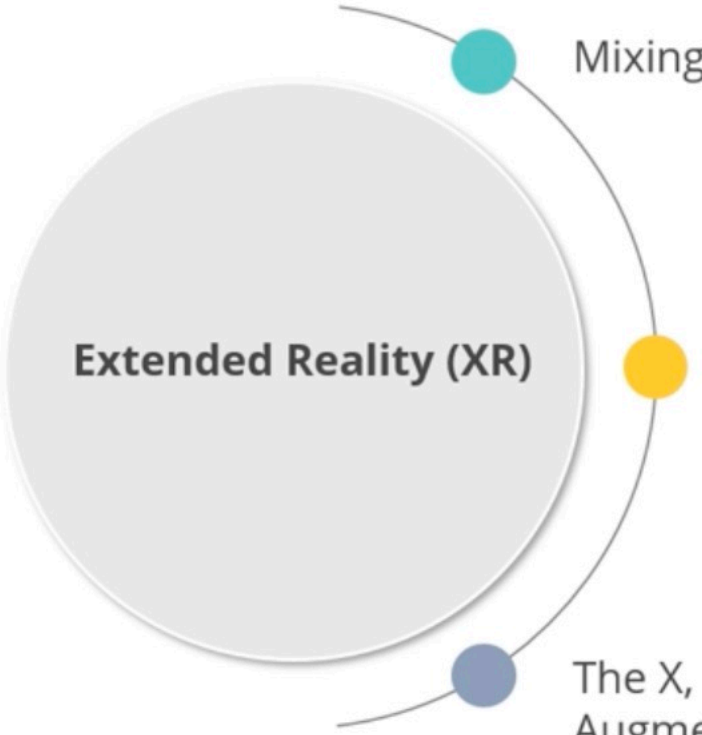
Learning Objectives

Advancement in digital technologies



Simulate physical machines' experience in virtual environment using extended reality

Extended Reality



Mixing reality and the virtual world

Environment that allows to interact with the virtual world

The X, here, denotes the type of technology (Mixed, Augmented, or Virtual)

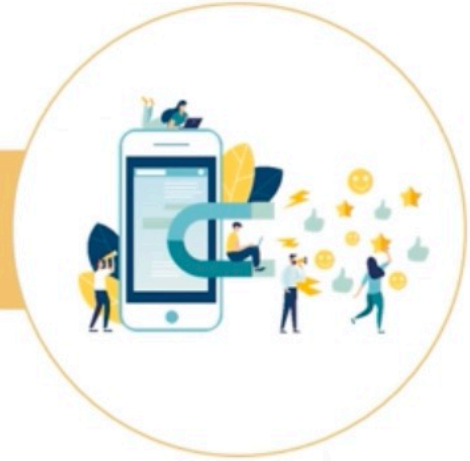
Extended Reality

Add virtual components to realities

Extended Reality

It creates unique experience with virtual scenarios.

It improves customer engagement significantly.



Ways of Building the XR Experience

Basics of Extended Reality

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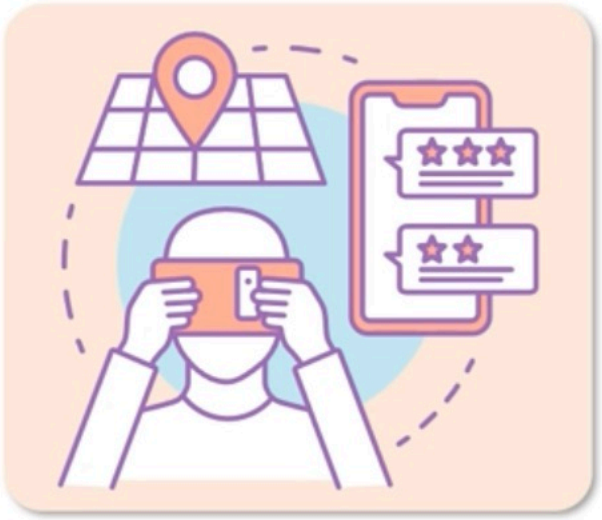
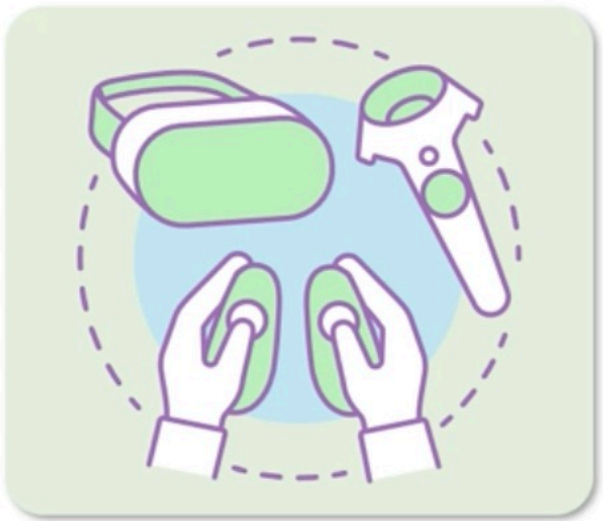
Types of Extended Reality



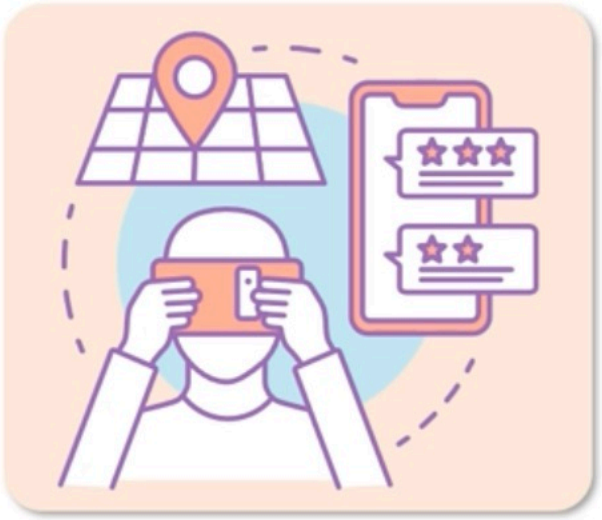
Augmented Reality



Virtual Reality

Mixed Reality

Augmented Reality



Augmented Reality

- A virtual object is integrated with the real object.
- The real and physical objects are enhanced with the help of technology.
- It augments components of the real-world objects and experience.

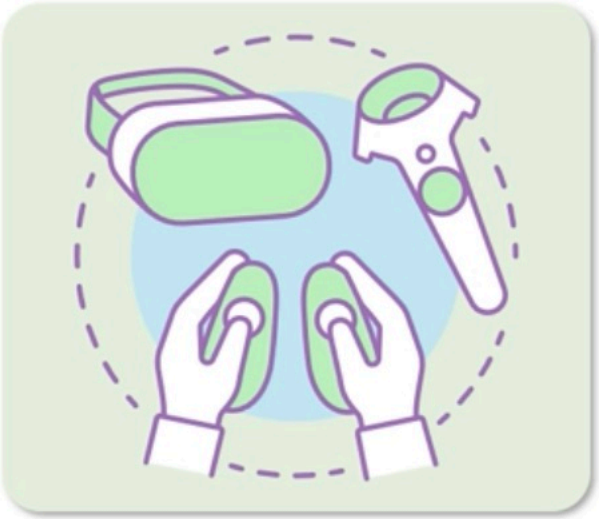
Augmented Reality

Ikea allows its consumers to visualize how a table would look after assembling it in their own homes.

The consumer can use his phone to see a 3D representation of the furniture.

Virtual Reality

There is no component of the real world.



Virtual Reality

A consumer gets submerged into the virtual world.

Virtual Reality

When worn, we are cut from the physical world and submerged into the digital world completely.

Google Cardboard

Samsung Gear VR

Virtual reality requires a separate device to enhance the experience.

Mixed Reality

It mixes the real and virtual worlds.

Mixed Reality

The interaction in a mixed reality solution is with both virtual and physical worlds.

Mixed Reality

A hologram is a perfect example of mixed reality.

Microsoft HoloLens

Microsoft HoloLens is a mixed reality device that allows developers to create solutions to interact with real world.

Developing an XR App

1

Business Goal:

- Define clearly what your organization wants to create
  - Example: A sports team wants to improve fan interaction and experience using XR

2

Feature List:

- Identify the features required for the solution
  - Example: Surface detection, voice interaction, and 3D visualization

3

Suitable XR Solutions:

- Decide if an AR, a VR, or an MR is the best fit for your organization

Developing an XR App

4

Technology and Tool Selection:

- Decide the technology to be used to build the solution
- Use TensorFlow, object recognition, Speechkit, or a software development kit (SDK)
  - Example: HoloLens from Microsoft has its own SDK

5

Integration Point:

- Identify the integration points with existing system
  - Example: Internal database of consumers and their order history can help to integrate their requirements

Applications of Extended Reality in: Automobiles, Remote Assistance, Interior Decoration, and In-Store Experience Transformation

DIGITAL BUSINESS

Automobile Industry: AR-Based Cars

Provide a seamless and convenient experience

Provide the ability to configure the color and other components of a car

Notify details like engine performance and carbon emission to users

Remote Assistance Using AR

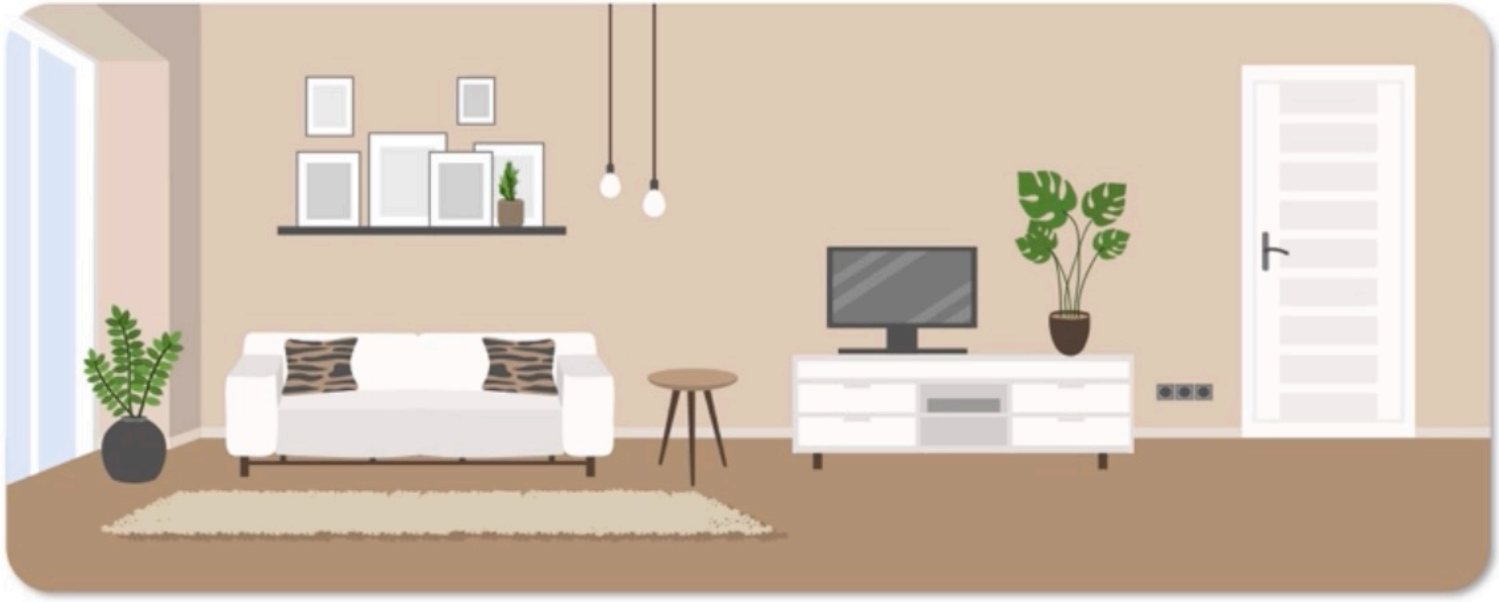
Is more successful than conventional training methods

Enables remote maintenance using 3D model simulation and voice assistance

Real-time interaction supported by voice-based assistance used to do a thorough check of all the tech points

Provides immersive training capability

Interior Decoration

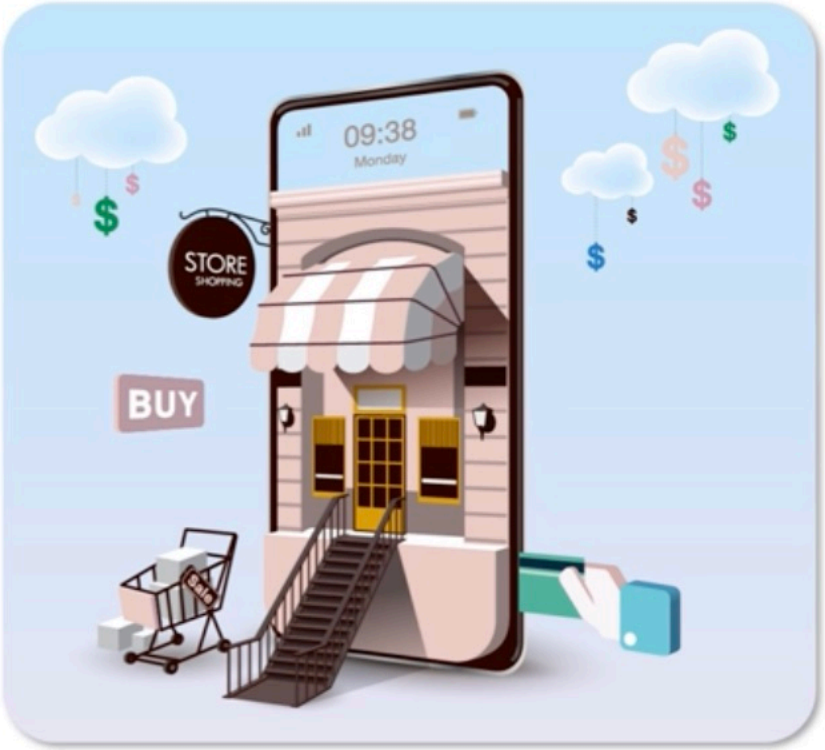


Provides smart, smooth, and easy shopping experience

Interior Decoration

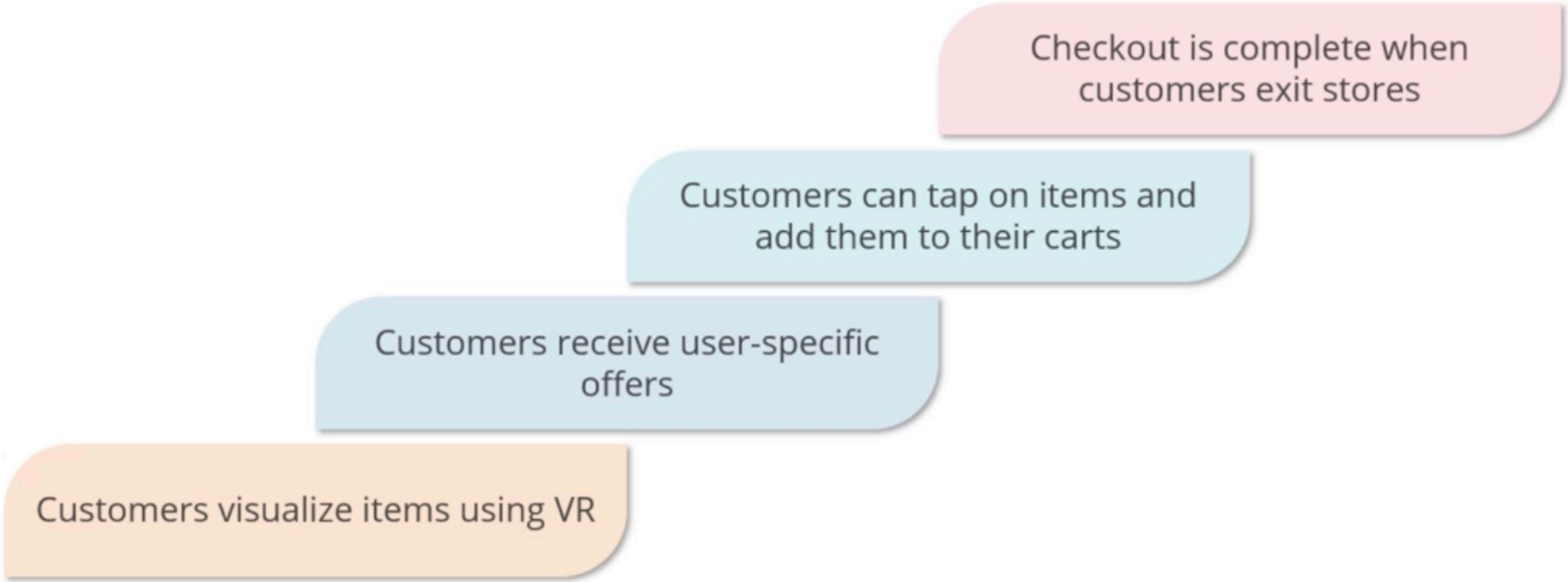
1. Needs to place a 3D model in a user-specified location
2. Can resize the object, rotate it, and position it in the desired location
3. Can overlay the 3D models on 2D photos
4. Can render the model in 3D, choosing any background color

In-Store Experience Transformation



- Improves in-store experience transformation
- Offers a seamless shopping experience

In-Store Experience Transformation



Automatic checkout through app is also possible

Applications of Extended Reality in: Sports, Retail, F&B, and Cosmetics

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Sports Industry: Training and Maintenance

- Provides training to sportsmen
- Helps players simulate their performance by providing real-time visualization
- Provides an intriguing experience where they can visualize playing against opponents

Retail Industry

Used in indoor navigation and product showcasing

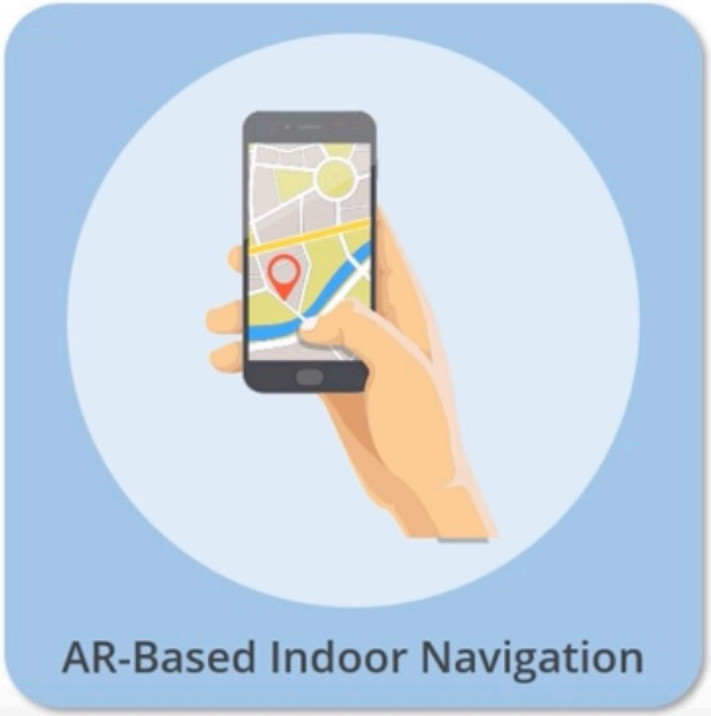
Enables visitors navigate to interesting areas

Helps visitors visualize interesting items in AR view

Targets both tourists and exhibitors

Retail Industry

Open camera and check AR directions to interesting areas



Retail Industry

Illustrate the products and machineries

Provide an immersive opportunity to imagine the item of interest using 3D models

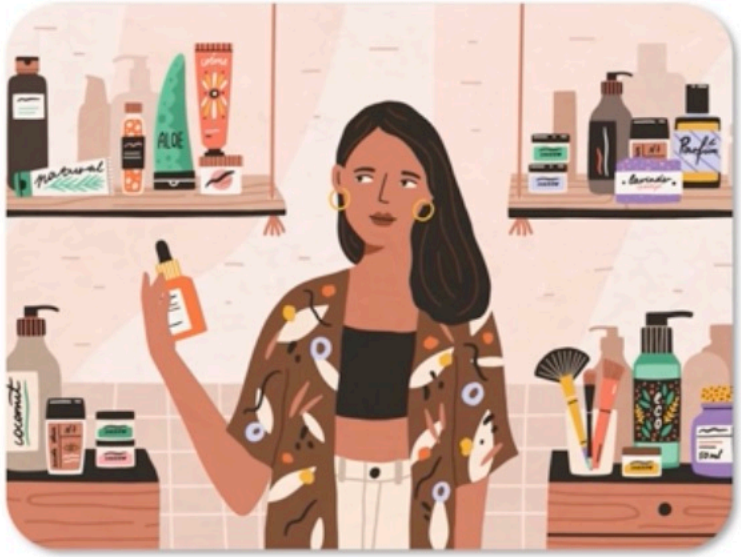
Food and Beverage Industry: Kitchen Management

To create the hands-free immersive kitchen manual

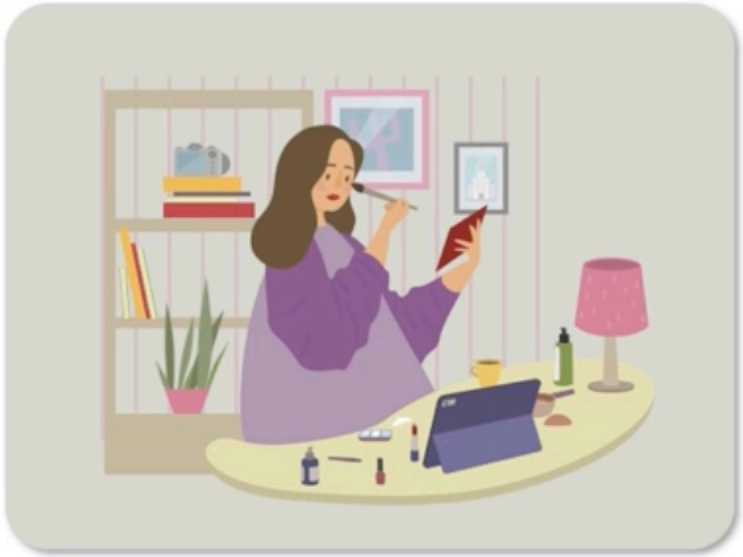
Food and Beverage Industry: Kitchen Management

- Visualize the product in real time
- Have an intriguing experience
- See how the item looks and follow recipes

Cosmetic Industry: Virtual Cosmetics

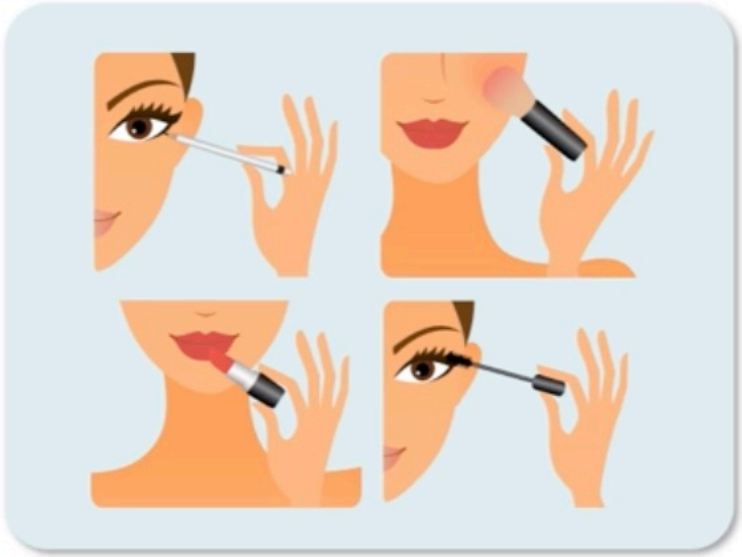


Allows customers to virtually apply makeup

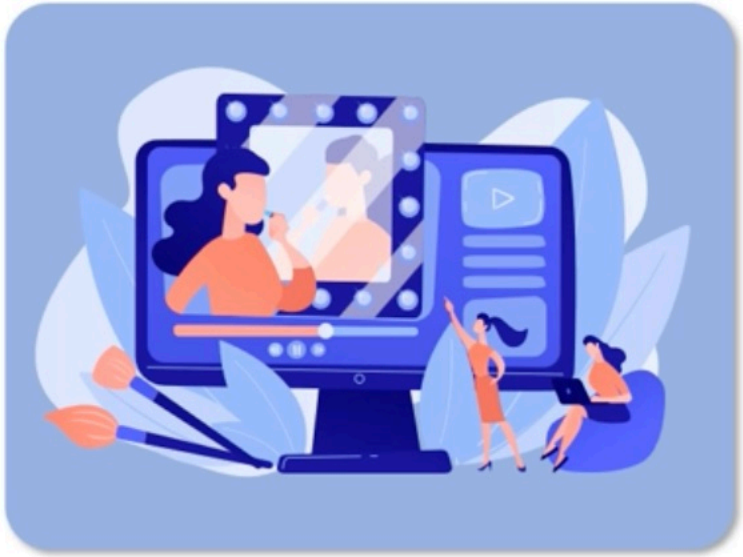


Helps customers select proper shades in makeup

Cosmetic Industry: Virtual Cosmetics



Select products with leisure from the comforts of your homes.



Upload images on any makeup app and try different makeup

Digital Disruption and Strategies for Digital Transformation

Edge Computing

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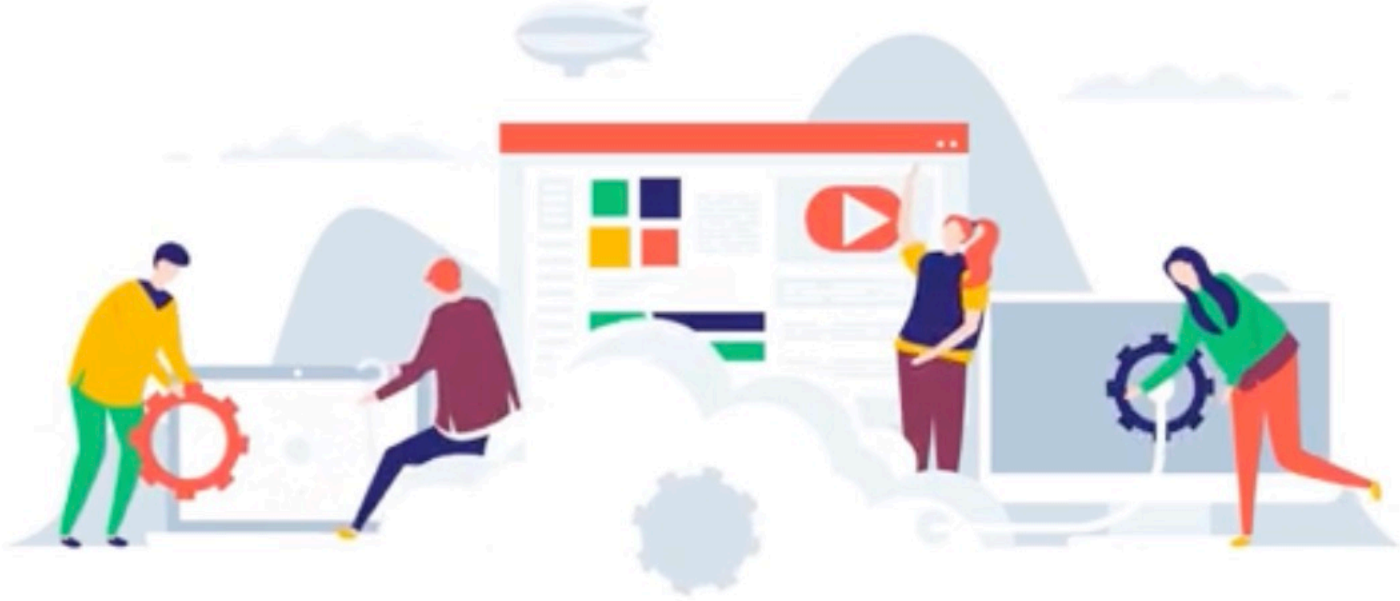
Introduction to Edge Computing

Edge computing brings the location of data storage closer to the power of computing. This helps capture, store, process, and analyze the data near its source.

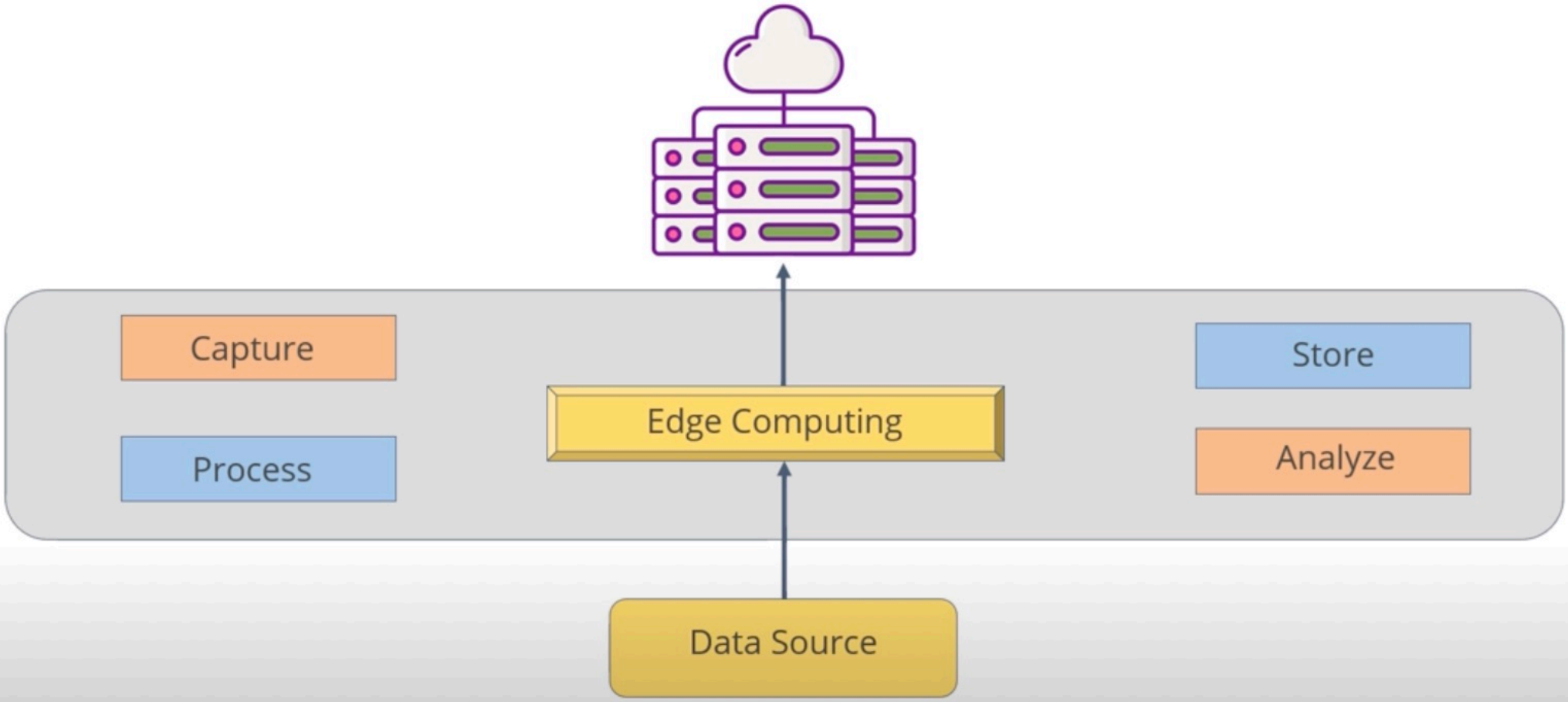


What Is Edge Computing?

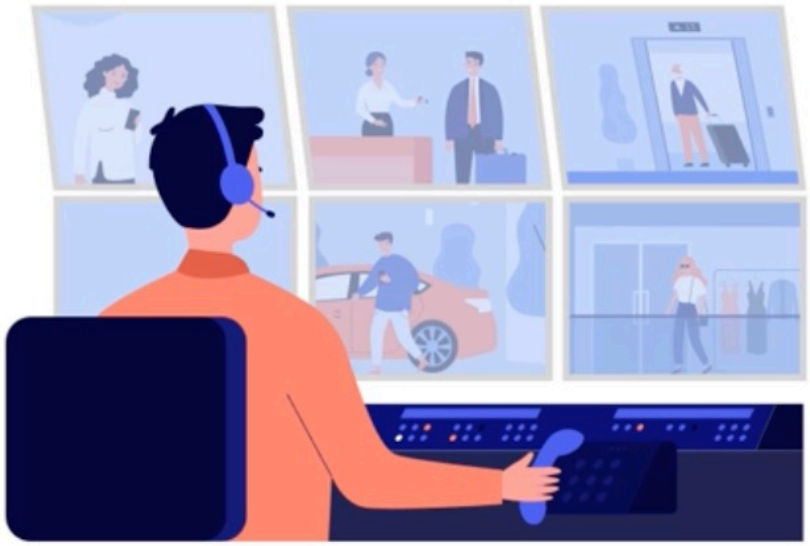
Gartner defines edge computing *as a part of a distributed computing topology in which information processing is located close to the edge – where things and people produce or consume that information.*

What Is Edge Computing?

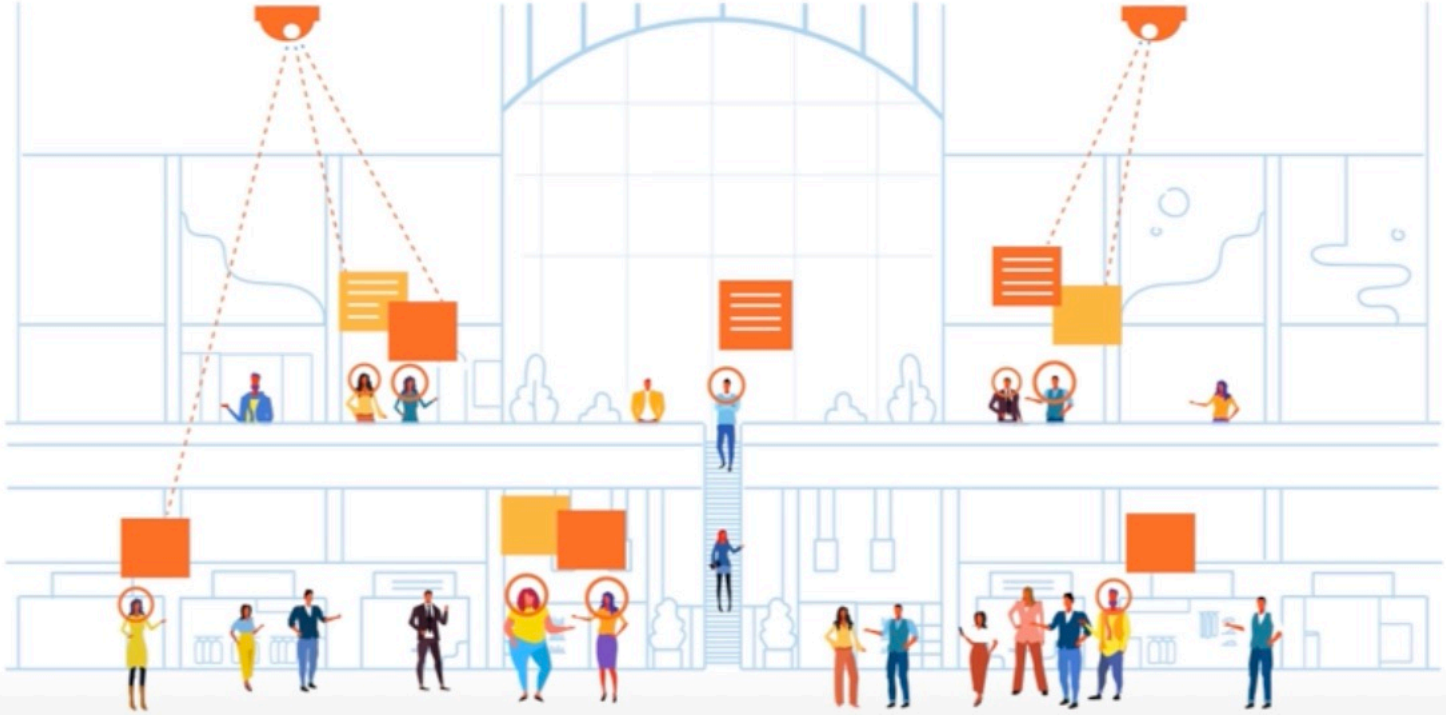
Edge computing is about bringing computing power closer to the source of data instead of transmitting the data to a centralized data center.

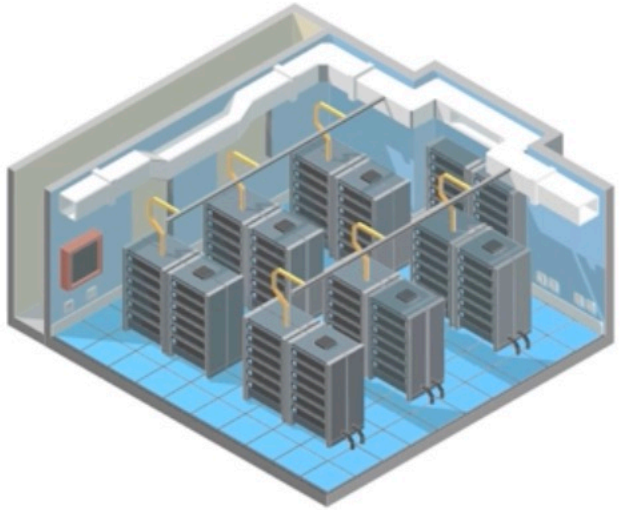


What Is Edge Computing?

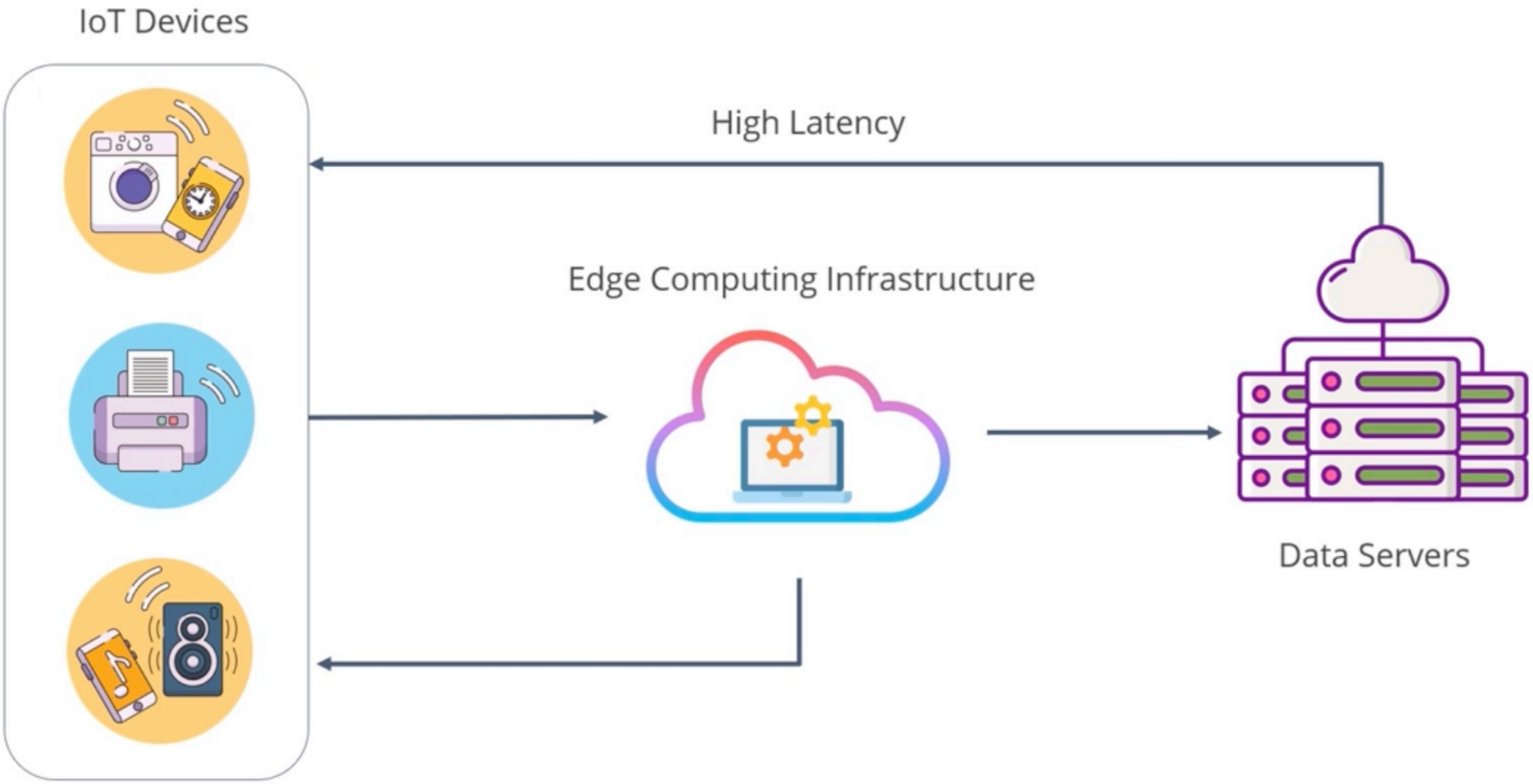


What Is Edge Computing?

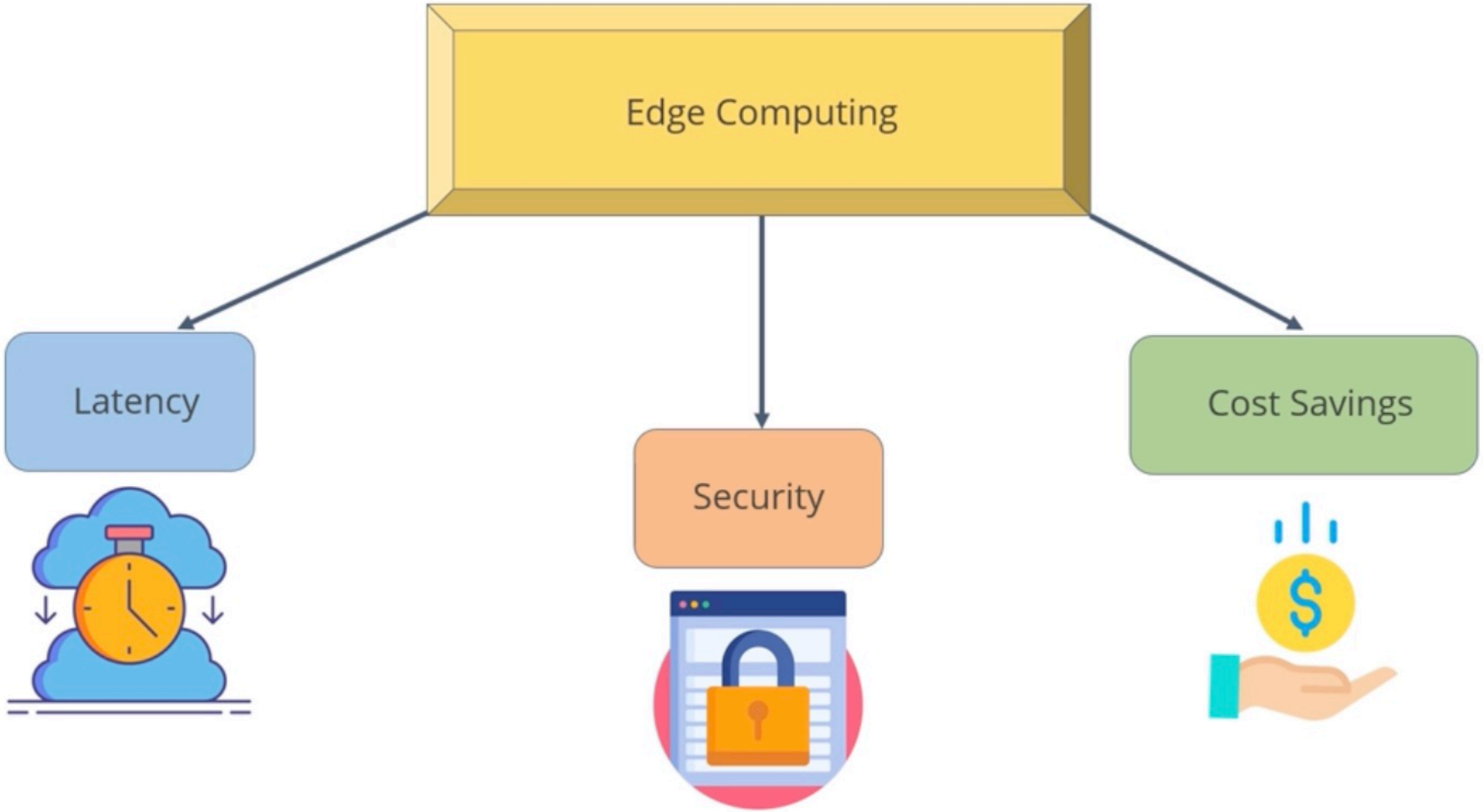




Edge Computing in IoT

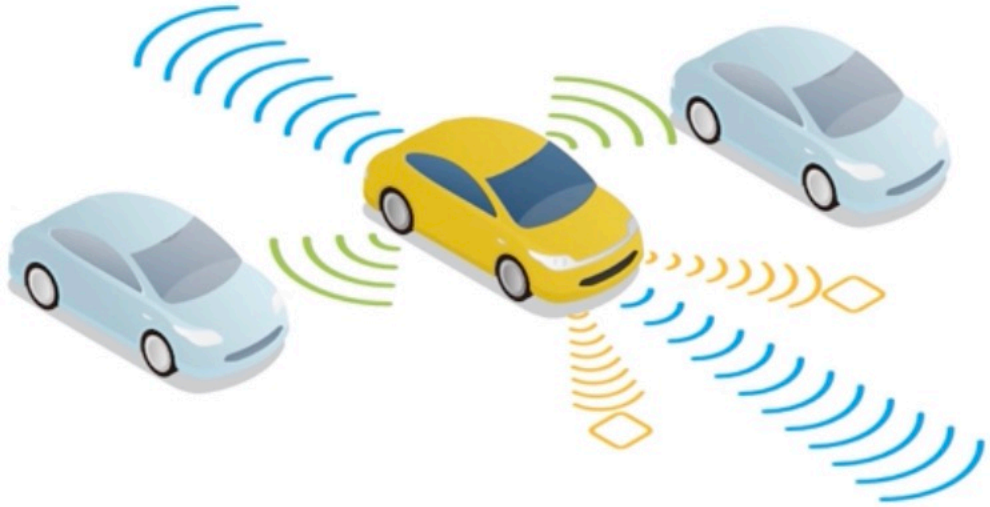


Benefits of Edge Computing



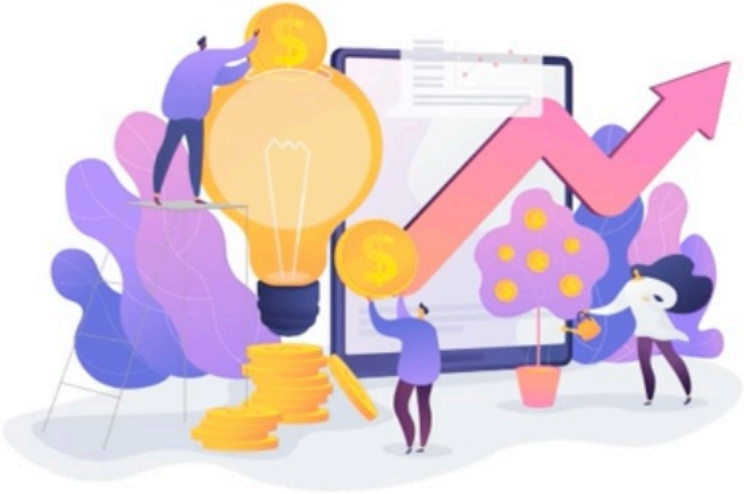
Why Care about Edge Computing

Applications that require autonomy



Why Care about Edge Computing

Applications that cannot tolerate latency



Why Care about Edge Computing

Applications that require significant bandwidth

How Does Edge Computing Enable New Digital Transformations?

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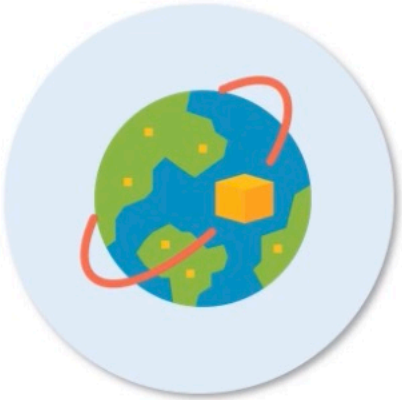
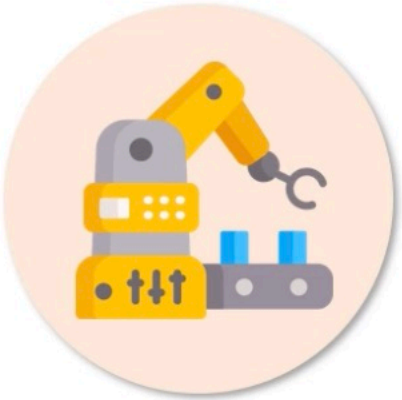
Edge Computing: Industries

Industries where edge computing will play a major role:



Transportation and Logistics

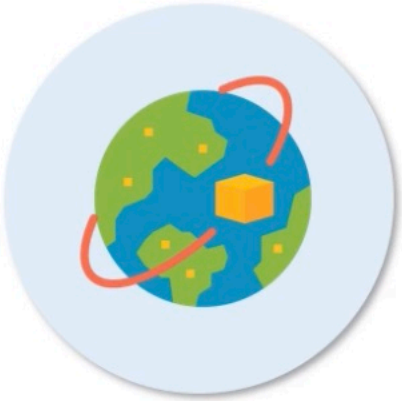


Manufacturing

Smart Cities and Industry 4.0

Healthcare

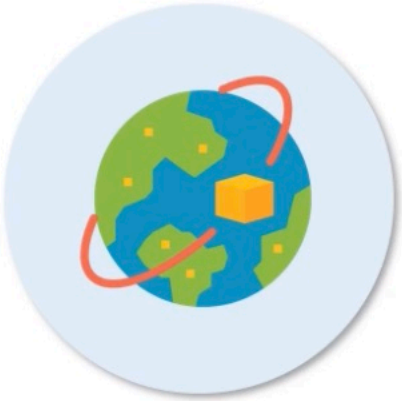
Transportation and Logistics



Transportation and Logistics

Autonomous Vehicle
• It is an unavoidable necessity. • It will create a lot of data. • Real-time response will be the biggest challenge. • Edge computing will provide necessary computing power.

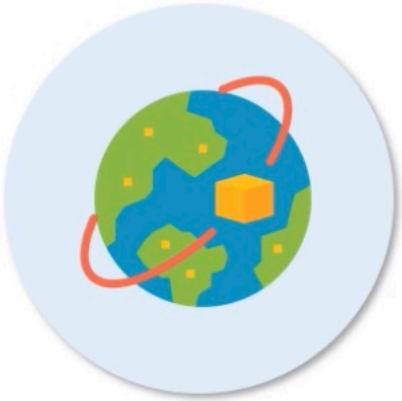
Transportation and Logistics



Transportation and Logistics

Fleet Optimization
• Breakdown of components is predictable • Driver tiredness is detectable • Collision is preventable

Transportation and Logistics

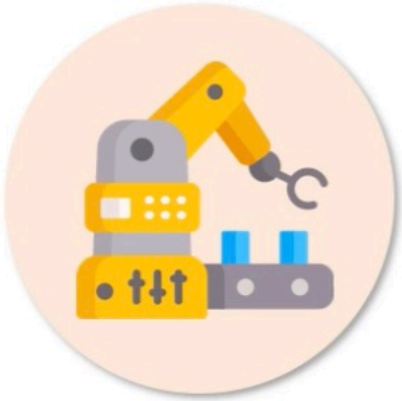


Transportation and Logistics

Cold Chain Logistics

- Supply chain storages suffer from wastage and loss
- Edge computing will provide real-time intelligence
- This will help with the creation of new business models

Manufacturing

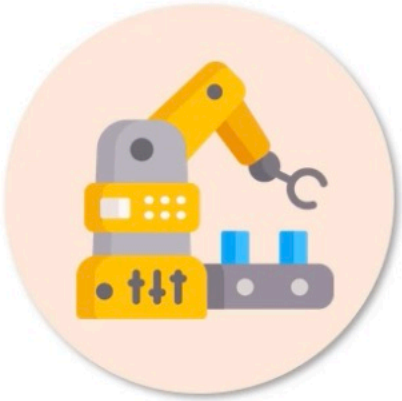


Manufacturing

Predictive Maintenance

- Manufacturers will be able to manage the performance of their equipment
- It will increase efficiency and cut down costs

Manufacturing

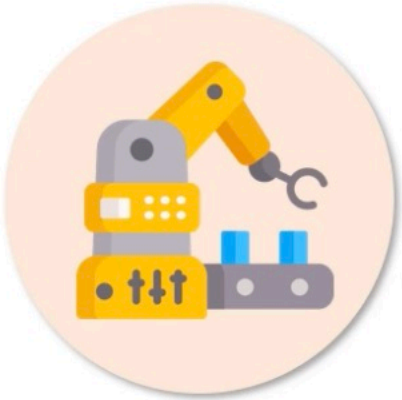


Manufacturing

Precision Monitoring & Control

- Helps to achieve precision
- Saves time in the process
- Avoids wastage during manufacturing

Manufacturing



Manufacturing

Condition-Based Monitoring

- Edge computing's locally available intelligence helps to achieve it
- Example of condition-based monitoring: Moving a finished product out when it does not meet the quality

Smart Cities

Smart Cities

Smart Traffic Management

- It can reduce pollution
- Processing power needs to stay close to traffic light

Smart Cities

Smart Cities

Smart Traffic Management

- It can reduce pollution
- Processing power needs to stay close to traffic light
- This can be enabled by edge computing

Smart Cities

Smart Cities

Smart Homes

- A lot of data and computing is needed
- Cost of bandwidth can be saved by edge computing
- Cloud transition will become easier as a result

Smart Cities

Smart Cities

Security Cameras

- Usage of surveillance cameras has increased
- Cost can be reduced by using locally computing cameras
- Interaction with cloud is possible if required

Healthcare

Healthcare

Rural Healthcare

- Procuring rural medicines becomes a problem due to connectivity issues
- IoT and edge computing can decrease dependency
- This can provide real-time support for rural locations

Healthcare

Healthcare

Health Monitoring Automation

- Real-time health monitoring is difficult because of unstructured data
- IoT equipments can find anomalies and send alerts
- This allows hospitals to respond in real time

Healthcare

Healthcare

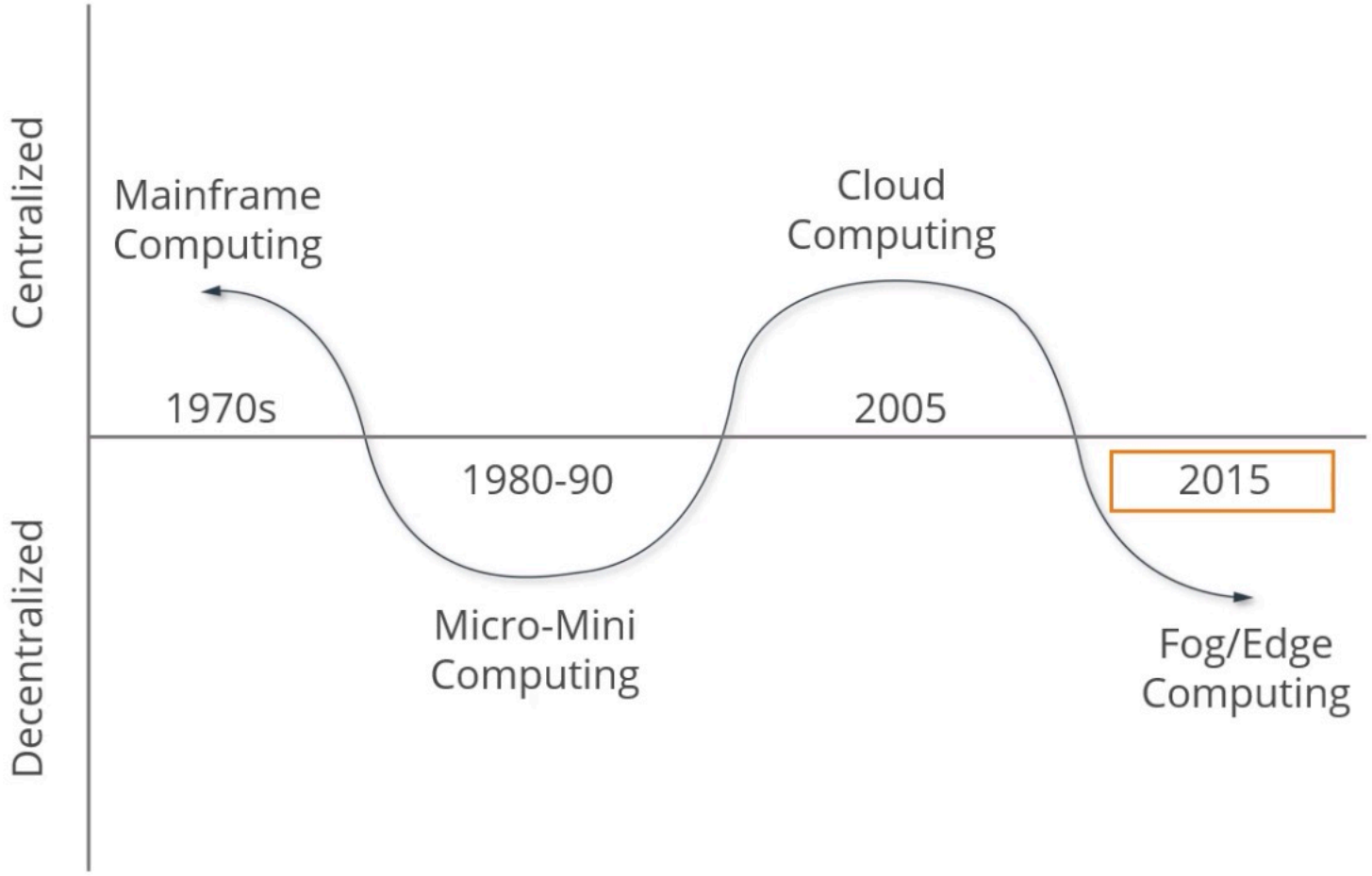
Patient Experience

- IoT equipments are useful for checking appointments
- Location-based movement are key edge computing solutions
- It can improve patient experience

Edge Computing Industry

DIGITAL BUSINESS

Growth of Edge Computing



Leading Players Offering Edge Computing

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Azure

Azure IoT Edge

Leading Players Offering Edge Computing

Google Cloud

Google Cloud IoT Edge

Leading Players Offering Edge Computing

IBM Edge Computing

Leading Players Offering Edge Computing

Edge Computing Industry

20 billion devices are expected to be running on edge by 2021.

The global edge computing market size is anticipated to reach USD 43.4 billion by 2027.

The Asia Pacific region is expected to emerge as the fastest-growing regional market for edge computing.

DISRUPTIVE TECHNOLOGIES AND
THEIR TRANSFORMATION POTENTIAL