Unit-3

Types of Information System - II

Prof. Suhag Baldaniya

Topics

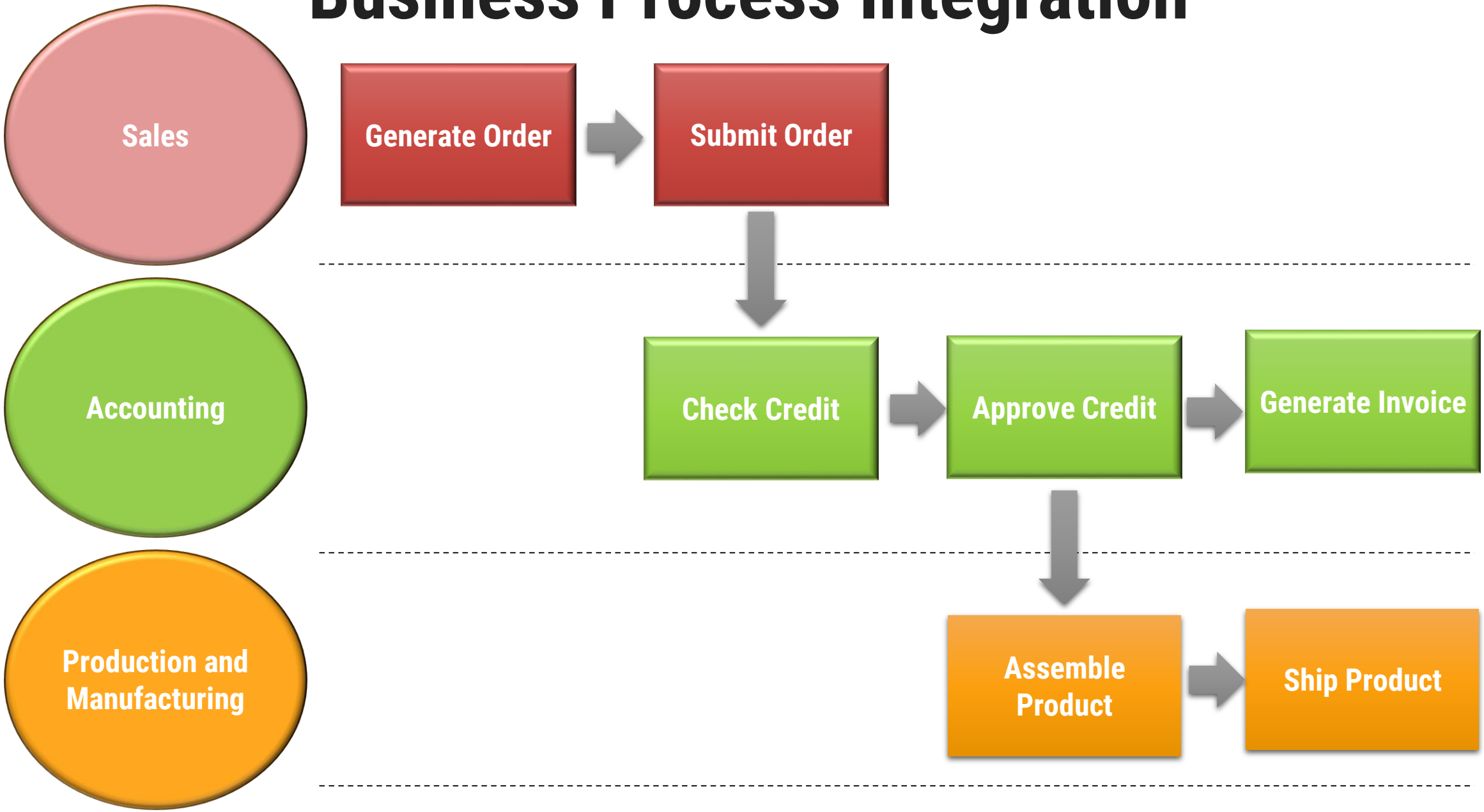
- Enterprise Systems
- Business Process integration
- Enterprise Resource Planning
- Supply Chain Management Systems
- Customer Relationship Management
- Business Intelligence
- Digital Dashboards
- Artificial Intelligence and Machine Learning – Expert Systems

Enterprise System

Enterprise System

- As businesses scale, small and outdated management systems cannot handle the increasing amount of data to process, resulting in errors and reduced efficiency.
- Enterprise systems (ES) or enterprise application software (EAS) tie together all aspects of enterprise operations and form an information system based on enterprise software packages.
- Such **software supports business processes, information flows, and provides reporting and data analytics** to enhance business performance.
- Enterprise systems may also **enable a business to reduce the cost of information technology and minimize the manual input of data.**
- These enterprise system attributes offer particular benefits, such as the support of teamwork, an improved response to the marketplace, increased work quality, and greater employee collaboration and efficiency.

Business Process Integration



Business Process Integration

- Business process integration in a Management Information System (MIS) **refers to the seamless coordination and synchronization of various business processes within an organization using technology and information systems.**
- The goal is to **enhance efficiency, streamline operations, and improve overall business performance**. Here are key aspects of business process integration in an MIS.
- **Understanding Business Processes**
  - Identify and document the key business processes within the organization, including both core and support processes.
  - Define the inputs, outputs, and activities involved in each process.
  - Determine the dependencies and relationships between different processes.

Business Process Integration

- **System Architecture**
  - Develop a robust MIS architecture that supports integration. This may involve using a centralized database, middleware, and standardized communication protocols.
  - Ensure that the MIS architecture is scalable and flexible enough to accommodate changes in business processes.
- **Data Integration**
  - Ensure that data is seamlessly shared across different business processes and departments.
  - Implement data standards and conventions to maintain consistency and accuracy.
  - Use data integration tools to facilitate the flow of information between different systems and databases.

Business Process Integration

- **Workflow Automation**
  - Integrate workflow automation tools to streamline and automate repetitive tasks within business processes.
  - Implement Business Process Management (BPM) tools to model, execute, monitor, and optimize workflows.
- **Communication and Collaboration**
  - Implement communication tools and platforms that facilitate collaboration and information sharing among employees and departments.
  - Utilize collaboration software, intranets, and other platforms to improve communication and coordination.

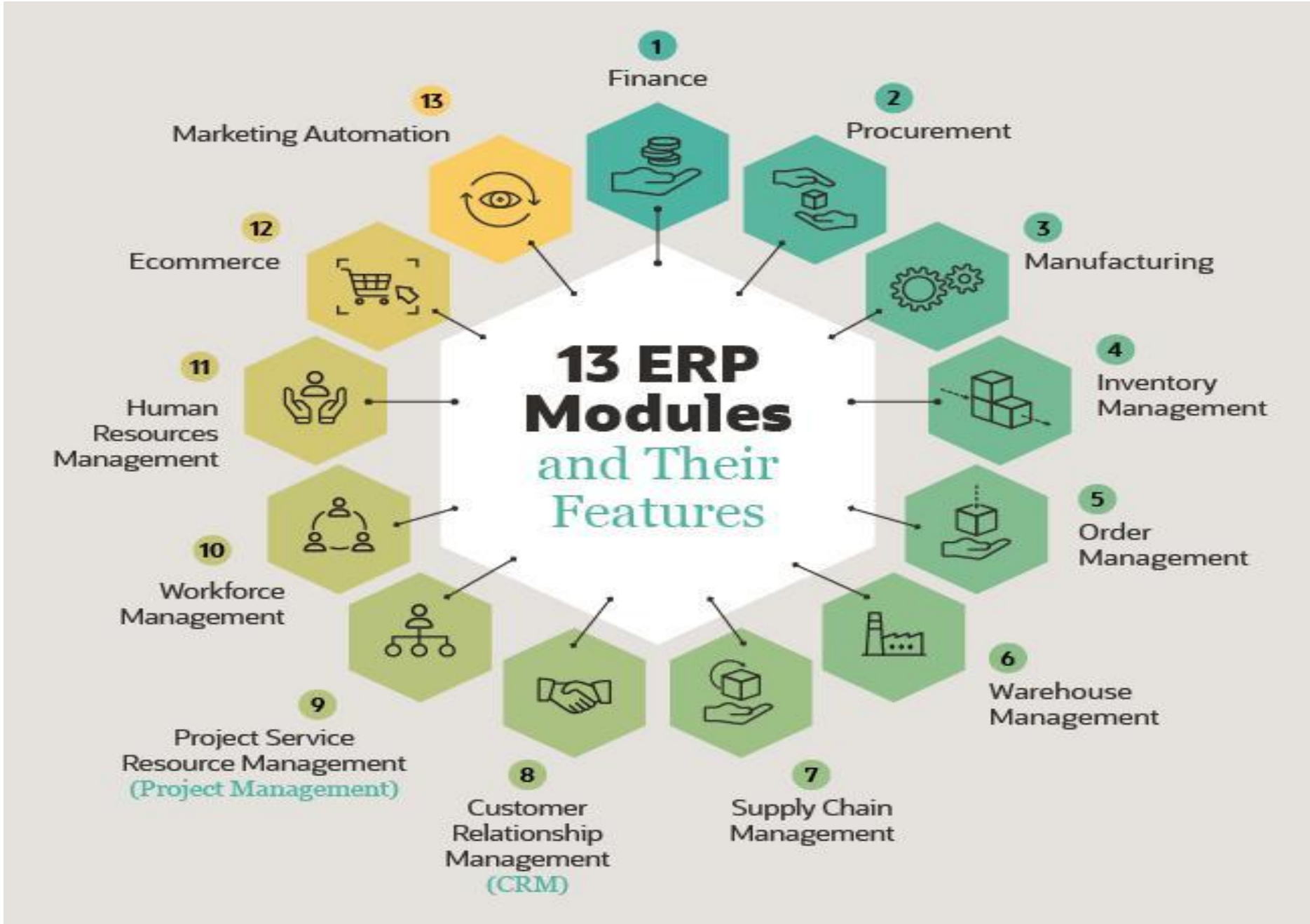
Business Process Integration

- **Real-time Monitoring and Reporting**
  - Implement real-time monitoring capabilities to track the status of various processes.
  - Develop comprehensive reporting mechanisms that provide insights into the performance of integrated processes.
- **Standardization of Processes**
  - Standardize business processes to ensure consistency and efficiency.
  - Align processes with industry best practices and regulatory requirements.
- **Security and Access Control**
  - Implement robust security measures to protect sensitive data and ensure that only authorized personnel have access to specific information.
  - Integrate access control mechanisms to regulate user permissions based on roles and responsibilities.

Types of Process Integrations

- **Native integrations**
  - A native integration is when data seamlessly flows between software applications. These integrations are already baked into the software, so the setup process is more straightforward. You just need to allow permission between the apps you want to connect.
- **API integrations**
  - An API integration is when two or more applications share data with each other through their application programming interfaces (APIs). For example, you'd use a custom API to connect your online store with a payment processor to accept orders if there are no native integrations.
- **Third-party integrations**
  - Companies with specialized needs often develop in-house software. But it's often more practical to use an existing tool to add a specific feature. You could use third-party integrations in these cases instead of developing a feature from scratch.

Enterprise Resource Planning System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Finance
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Warehouse Management
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Customer Relationship Management (CRM)
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Project Service Resource Management (Project Management)
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Workforce Management
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Human Resources Management
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Ecommerce
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Marketing Automation
13 ERP Modules
and Their Features

Enterprise Resource Planning (ERP)

- Businesses implement *Enterprise Resource Planning (ERP)* **to integrate procurement, finance, accounting, marketing, and human resources processes.**
- In ERP, these modules are interconnected with the ability to distribute information. Each module uses several apps that can carry out certain actions.
  - ↪ For example, it helps promote products via different communication channels, and provides marketing analytics, data generation, and reporting.
- Companies can adjust the ERP system to respond **to the needs of different industries such as healthcare, retail, finance, law, architecture, hospitality, etc.**
- Within a given sector, it is possible to customize ERP to create account payables, reports and timesheets to facilitate routine tasks in the organization.

Enterprise Resource Planning (ERP)

- ERP software can **integrate all of the processes** needed to run a company.
- ERP solutions have **evolved over the years**, and many are now typically web-based applications that users can access remotely.
- Some benefits of **ERP include the free flow of communication between business areas, a single source of information, and accurate, real-time data reporting**.
- There are **hundreds of ERP applications a company can choose from**, and most can be customized.
- An **ERP system can be ineffective if a company doesn't implement it carefully.**

Types of ERP

- Generally there are three deployment options for ERP systems.
  - Cloud-based
  - On-premise
  - Hybrid of the two.
- Within these options, a business can choose from hundreds of types such as finance, supply chain management, and human resource management.

What Does ERP Do?

- ERP applications also allow the different departments to communicate and share information more easily with the rest of the company.
- It collects information about the activity and state of different divisions, making this information available to other parts, where it can be used productively.
- ERP applications can help a corporation become **more self-aware by linking information about production, finance, distribution, and human resources together.** Because it connects different technologies used by each part of a business, an ERP application can eliminate costly duplicates and incompatible technology.
- The process often **integrates accounts payable, stock control systems, order-monitoring systems, and customer databases into one system.**

How Does It Work?

- ERP has evolved over the years from traditional software models that made use of physical client servers and manual entry systems to cloud-based software with remote, web-based access.
- The platform is generally **maintained by the company that created it, with client companies renting services provided by the platform.**
- Businesses select the applications they want to use. Then, the hosting company loads the applications onto the server the client is renting, and both parties begin working to integrate the client's processes and data into the platform.
- Once all departments are tied into the system, all data is collected on the server and becomes instantly available to those with permission to use it.
- Reports can be generated with metrics, graphs, or other visuals and aids a client might need to determine how the business and its departments are performing.

Benefits of Enterprise Resource Planning

- **Improves Accuracy and Productivity**
  - Integrating and automating business processes eliminates redundancies and improves accuracy and productivity. In addition, departments with interconnected processes can synchronize work to achieve faster and better outcomes.
- **Improves Reporting**
  - Some businesses benefit from enhanced real-time data reporting from a single source system. Accurate and complete reporting help companies adequately plan, budget, forecast, and communicate the state of operations to the organization and interested parties, such as shareholders.
- **Increases Efficiency**
  - ERPs allow businesses to quickly access needed information for clients, vendors, and business partners. This contributes to improved customer and employee satisfaction, quicker response rates, and increased accuracy rates. In addition, associated costs often decrease as the company operates more efficiently.

Benefits of Enterprise Resource Planning

- **Increases Collaboration**
  - Departments are better able to collaborate and share knowledge; a newly synergized workforce can improve productivity and employee satisfaction as employees are better able to see how each functional group contributes to the mission and vision of the company. Also, menial and manual tasks are eliminated, allowing employees to allocate their time to more meaningful work.

ERP Weaknesses

- An ERP system **doesn't always eliminate inefficiencies within a business or improve everything.**
- The company might **need to rethink how it's organized or risk ending up with incompatible technology.**
- ERP systems usually fail to achieve the objectives that influenced their installation because of a company's reluctance to abandon old working processes. **Some companies may also be reluctant to let go of old software that worked well in the past.**
- The key is to prevent **ERP projects** from being **split into smaller projects**, which can result in **cost overruns**.

ERP Solutions Providers

- Some familiar names are leaders in ERP software.
- **Oracle Corp. (ORCL)** originally supplied a relational database that integrated with ERP software developed by SAP (SAP) before entering the broader enterprise market in a big way in the early 2000s.
- **Microsoft (MSFT)** has long been an industry leader, with many customers using multiple software applications from the company.
- As cloud-based solutions have grown in popularity in recent years, the traditional ERP industry leaders have seen challenges from upstarts such as Bizowie and Workwise.

ERP Example

- Cadbury
  - Cadbury, a global confectioner and maker of the popular chocolate Cadbury egg, also successfully implemented an ERP system.
  - The company had thousands of systems but could not keep pace with its rapid growth and used ineffective warehouse management systems.
  - It implemented a system that integrated its thousands of applications, standardized processes, and restructured warehouse management systems—breaking down silos for seamless, integrated coordination of work.

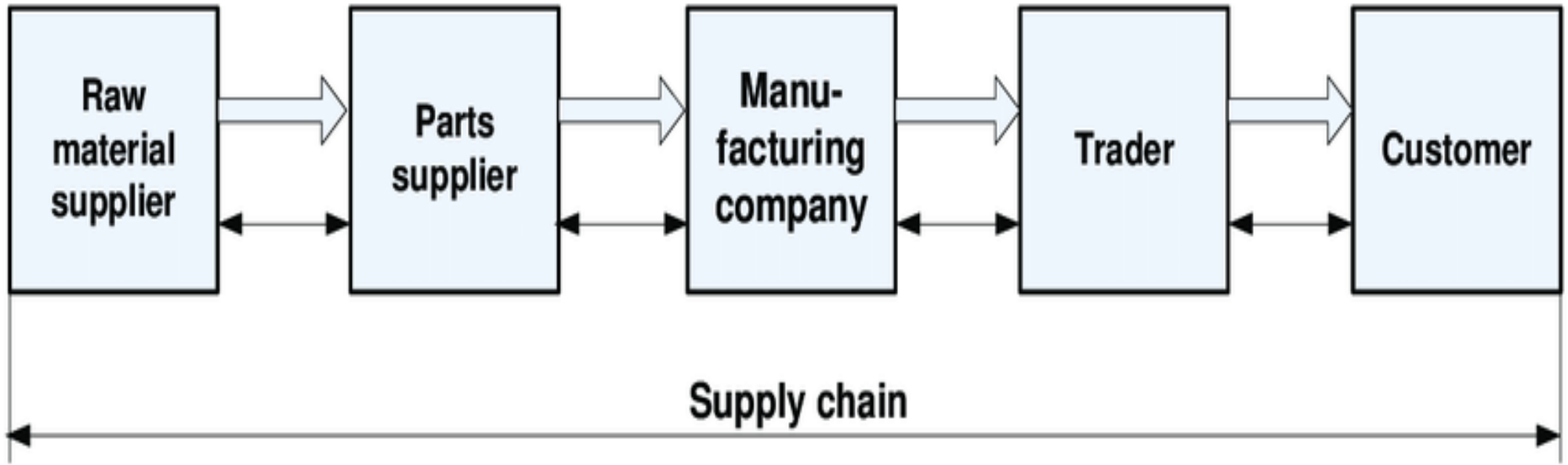
5 Components of ERP

- The components of an ERP system depend on the organization's needs.
- However, there are key features that each ERP should include.
- Generally, packages include finance, human resource, logistics and manufacturing, supply chain management, and customer relationship management.

Supply Chain Management System

Supply Chain Management System

- In a traditional manufacturing environment, supply chain management meant **managing movement and storage of raw materials, work-in-progress inventory, and finished goods from point of origin to point of consumption.**
- It involves **managing the network of interconnected smaller business units**, and **networks of channels** that take part in producing merchandise of a service package required by the end users or customers.
- With businesses crossing the barriers of local markets and reaching out to a global scenario, SCM is now defined as –
- **Design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally.**



Material flow

Information flow

Objectives of SCM

- To **decrease inventory cost** by more accurately predicting demand and scheduling production to match it.
- To **reduce overall production cost** by streamlining production and by improving information flow.
- To improve customer satisfaction.

Supply Chain Management System

- SCM consists of – **Operations management, Logistics, Procurement, Information technology, and Integrated business operations.**
- Several companies in India have adopted advanced technologies to streamline their supply chain processes. Here are a few examples:
- **Reliance Industries Limited**
  - **Industry-** Diversified conglomerate with interests in petrochemicals, refining, telecommunications, and retail.
  - **Supply Chain Technology Adoption-** Reliance Industries has been known for investing in cutting-edge technologies, including supply chain management systems, to optimize their operations. Their retail arm, Reliance Retail, uses sophisticated supply chain technologies to manage inventory, distribution, and delivery for their extensive network of stores.

Supply Chain Management System

- **Flipkart**
  - **Industry-** E-commerce and online retail.
  - **Supply Chain Technology Adoption-** Flipkart, one of India's leading e-commerce platforms, has heavily invested in supply chain management systems to handle the complexities of order fulfillment, inventory management, and last-mile delivery. They utilize data analytics, automation, and artificial intelligence to optimize their supply chain processes.
- **Mahindra & Mahindra**
  - **Industry-** Automotive and farm equipment manufacturing.
  - **Supply Chain Technology Adoption-** Mahindra & Mahindra has integrated advanced supply chain management systems to improve the efficiency of their manufacturing and distribution processes. They leverage technology for demand forecasting, production planning, and logistics optimization to ensure timely delivery to dealers and customers.

SCM System – Need and Customer Specificity

- A supply chain management system with a focus on **customer-centricity** is crucial for meeting and exceeding customer expectations. By aligning supply chain processes with customer needs and preferences, businesses can enhance customer satisfaction, loyalty, and overall competitiveness.
- **Demand Sensing and Forecasting**
  - **Need:** Accurately anticipating customer demand is essential for ensuring that products are available when and where customers want them.
  - **Specificity:** Advanced analytics, machine learning, and data-driven forecasting techniques can be employed to understand customer behavior, seasonality, and market trends. This enables businesses to align production and inventory levels with actual demand.

SCM System – Need and Customer Specificity

- **Responsive and Agile Supply Chain**
  - **Need:** Customers today expect quick delivery and responsiveness to changes in demand or market conditions.
  - **Specificity:** Adopting agile supply chain practices, including flexible manufacturing processes and real-time monitoring of inventory levels, helps businesses respond swiftly to changes in customer demand, reducing lead times and improving overall responsiveness.
- **Inventory Optimization**
  - **Need:** Balancing inventory levels is critical to prevent stockouts or excess inventory, ensuring products are available to customers when needed.
  - **Specificity:** Utilizing technology like RFID, barcoding, and real-time inventory tracking systems helps optimize inventory levels, reducing carrying costs while ensuring products are in stock when customers place orders.

SCM System – Need and Customer Specificity

Collaboration and Visibility

- **Need:** Transparent communication and collaboration across the supply chain are essential for meeting customer expectations.
- **Specificity:** Implementing collaborative platforms and technologies that provide end-to-end visibility into the supply chain allows different stakeholders to share information in real-time. This transparency helps in resolving issues quickly, improving communication, and enhancing overall efficiency.

Last-Mile Delivery Optimization

- **Need:** The final stage of the supply chain, known as the last mile, is critical for customer satisfaction as it involves the actual delivery to the customer's location.
- **Specificity:** Utilizing route optimization algorithms, GPS tracking, and real-time communication tools for delivery personnel can enhance the efficiency of last-mile delivery, ensuring on-time and accurate deliveries.

SCM System – Need and Customer Specificity

- **Customization and Personalization**
  - **Need:** Customers increasingly seek personalized products or experiences.
  - **Specificity:** Integrating flexible manufacturing processes that allow for product customization and implementing customer relationship management (CRM) systems can enable businesses to tailor offerings to individual customer preferences.
- **Return and Reverse Logistics**
  - **Need:** Providing an efficient and hassle-free return process is crucial for customer satisfaction.
  - **Specificity:** Streamlining reverse logistics processes and implementing efficient return systems help manage product returns, exchanges, and refunds, contributing to a positive customer experience.

Customer Relationship Management System

Customer Relationship Management System

- CRM stands for Customer Relationship Management. CRM is a term used to describe the **management of customers, clients, and other relationships** in a business.
- CRM is a **client-centered approach that ensures that the customers are provided with more value than expected and treated as an asset rather than as a liability.**
- CRM is the **combination of practices, strategies, and technologies** that companies use to manage and analyze customer interactions and data throughout the customer lifecycle.
- The goal is **to improve customer service relationships assist with customer retention and drive sales growth.**

Benefits of CRM

- The benefits of CRM systems apply to all types of organizations, ranging from small businesses to large corporations. They include the following:
- **Enhanced customer service**
  - Having customer information, such as past purchases and interaction history, easily accessible helps customer support representatives provide better and faster customer service.
- **Trend spotting**
  - Collection of and access to customer data let businesses identify trends and insights about their customers through reporting and visualization features.
- **Automation**
  - CRM systems can automate menial, but necessary, sales pipeline and customer support tasks.

Components of CRM

- **Marketing automation**
  - CRM tools with marketing automation capabilities automate repetitive tasks to enhance marketing efforts at different touchpoints in the lifecycle for lead generation.
  - For example, as sales prospects come into the system, it might automatically send email marketing content with the goal of turning a sales lead into a full-fledged customer.
- **Sales force automation**
  - These tools track customer interactions and automate certain business functions of the sales cycle.
  - Sales force automation tools target sales functions where it's necessary to follow leads, obtain new customers and build customer loyalty.

Components of CRM

- **Contact center automation**
  - Designed to reduce tedious aspects of a contact center agent's job, contact center automation includes prerecorded audio that assists in customer problem-solving and information dissemination.
  - Various software tools that integrate with the agent's desktop tools can handle customer requests to cut down the length of calls and streamline customer service processes. Automated contact center tools, such as chatbots, can improve customer user experiences.
- **Geolocation technology, or location-based services**
  - Some CRM systems include technology that creates geographic marketing campaigns based on customers' physical locations, sometimes integrating with popular location-based Global Positioning System (GPS) apps.
  - Geolocation technology is also used as a networking or contact management tool to find sales prospects based on a location.

Components of CRM

- **Workflow automation**
  - CRM systems help companies optimize business processes by streamlining mundane workloads, enabling employees to focus on high-level and creative tasks that help them close deals.
- **Lead management**
  - Sales leads can be tracked through a CRM platform, enabling sales teams to input, track and analyze data for leads in one place.
- **Analytics**
  - CRM analytics examines user data to create targeted marketing campaigns that can increase customer satisfaction rates.
- **Artificial intelligence (AI)**
  - AI technologies, such as Salesforce Einstein, have been built into CRM platforms to automate repetitive tasks, identify customer-buying patterns and predict future customer behaviors.

Types of CRM Technology

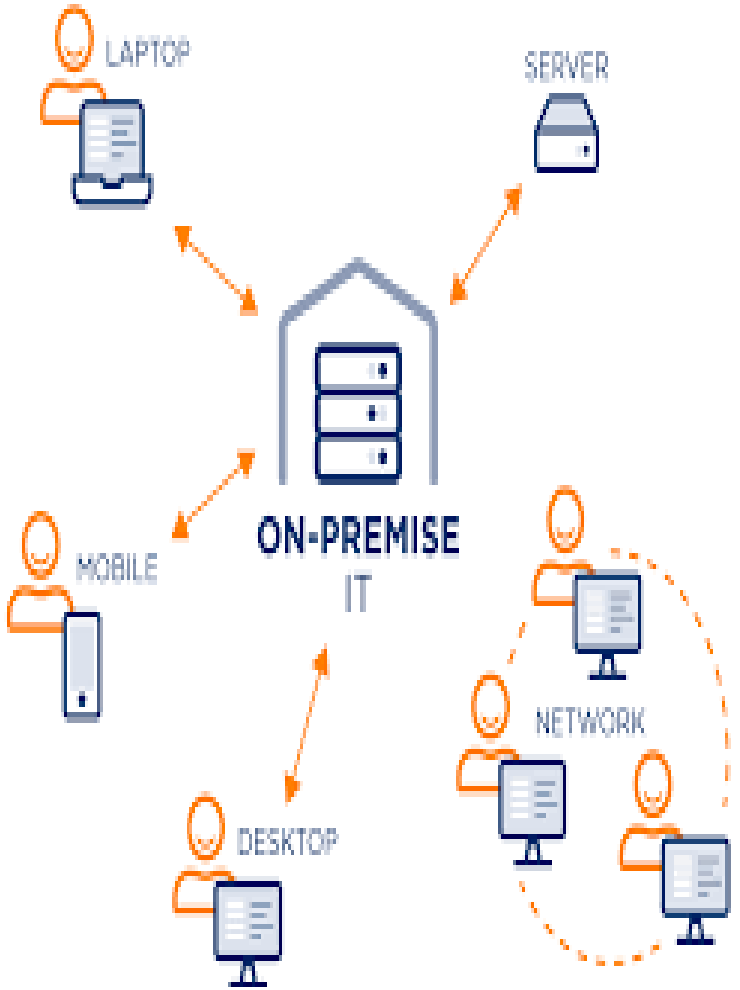
Cloud-based CRM

- CRM that uses cloud computing is also **known as software as a service or on-demand CRM.**
- Data is **stored on an external, remote network** that **employees can access anytime and anywhere** there is an internet connection.
- Sometimes, a **third-party service provider** oversees system **installation and maintenance**.
- The cloud's quick and easy deployment capabilities appeal to companies with limited technological expertise or resources.
- Popular **cloud-based CRM providers include HubSpot, Salesforce, Zendesk, and Zoho.**

Types of CRM Technology

On-premises CRM

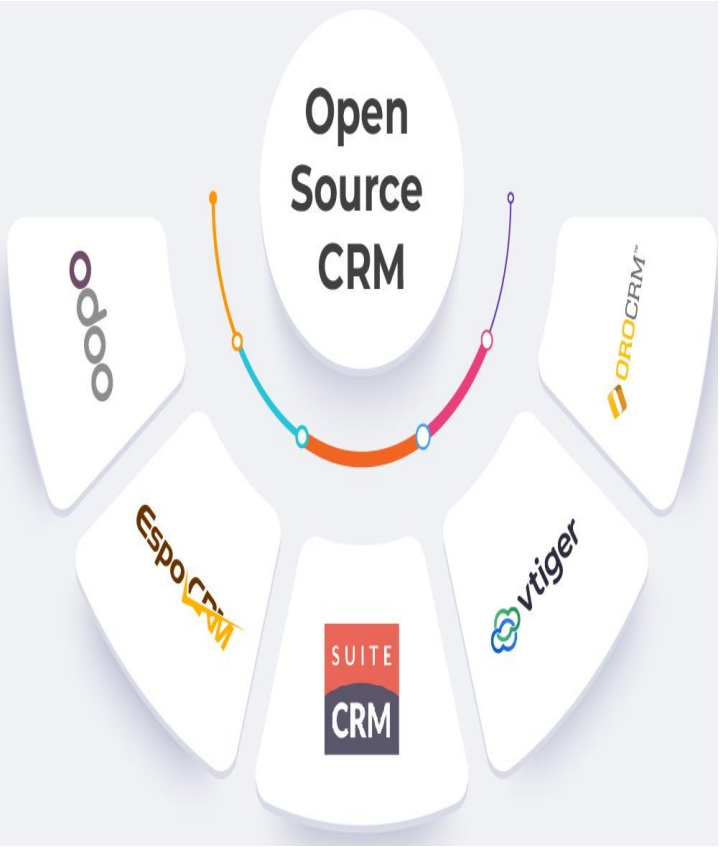
- On-premises CRM puts the onus on **administration, control, security, and maintenance of the database and information** on the company using the CRM software.
- With this approach, the company purchases licenses upfront, instead of buying yearly subscriptions from a cloud CRM provider.
- The software resides on the company's servers, and the user assumes the cost of any upgrades. It also usually requires a prolonged installation process to fully integrate a company's data. **Companies with complex CRM needs might benefit from an on-premises deployment**.
- Many cloud-based providers, such as **Aptean** and Salesforce, also offer **on-premises versions of their CRM software.**



Types of CRM Technology

Open source CRM

- An **Open Source CRM system makes source code available to the public, enabling companies to make alterations at no cost to the company** using the system.
- Open source CRM systems **enable the addition and customization of data links on social media channels**, assisting companies looking to improve social CRM practices.
- Platforms such as **Bitrix24, OroCRM, SugarCRM and SuiteCRM** offer alternatives to the proprietary platforms from Salesforce, Microsoft and other vendors.
- Adoption of any of these CRM deployment methods depends on a company's business needs, resources and goals, as each has different costs associated with it.



Business Intelligence

Business Intelligence (BI)

- BI represents the **technical infrastructure that collects, stores, and analyzes** company data.
- BI parses data and **produces reports and information that help managers to make better decisions**.
- Software companies produce **BI solutions** for companies that wish **to make better use of their data**.
- BI tools and software come in a wide variety of forms such as **spreadsheets, reporting/query software, data visualization software, data mining tools, and online analytical processing (OLAP).**
- Self-service **BI is an approach to analytics that allows individuals without a technical background** to access and explore data.

Retail Analysis Sample PBIX - Power BI Des...

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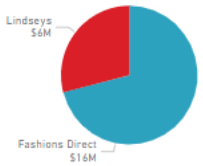
Store Sales Overview

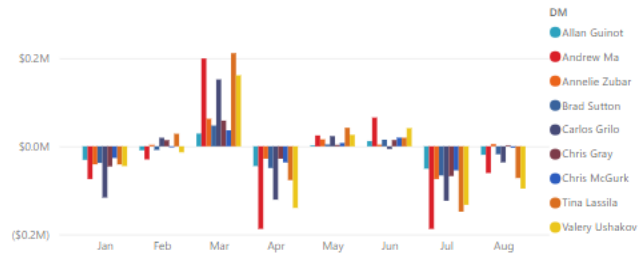
This Year Sales by Chain



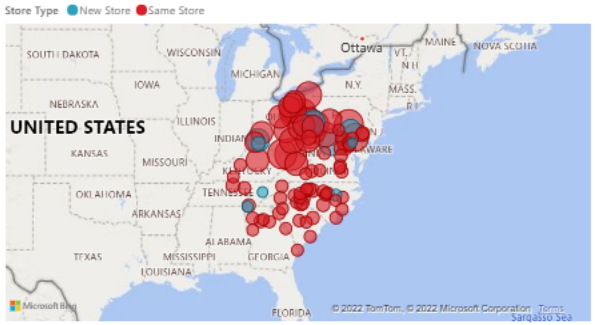
10
New Stores

104
Total Stores

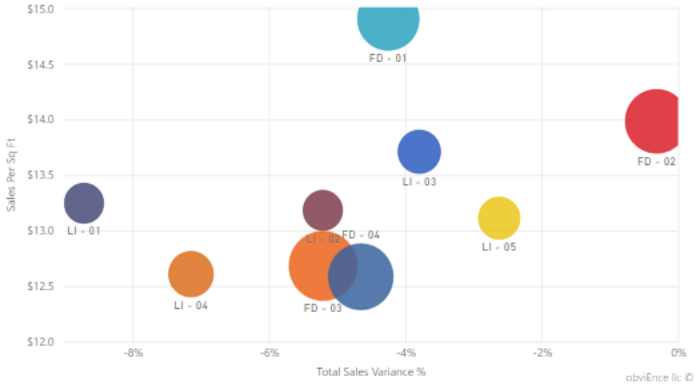
Total Sales Variance by FiscalMonth and District Manager



This Year Sales by PostalCode and Store Type



Total Sales Variance %, Sales Per Sq Ft and This Year Sales by District and District



Filters

Search

Filters on this page

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Visualizations

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Values

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Drill through

Cross-report: Off

Keep all filters: On

Add drill-through fields here

Fields

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- Sales
- District
- Item
- Store
- Time

Info | Overview | District Monthly Sales | New Stores | +

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Paste Cut Copy Format painter — Clipboard

Get data Excel workbook Data hub SQL Server Enter data Dataverse Recent sources — Data

Transform data Refresh — Queries

New visual Text box More visuals — Insert

New measure Quick measure — Calculations

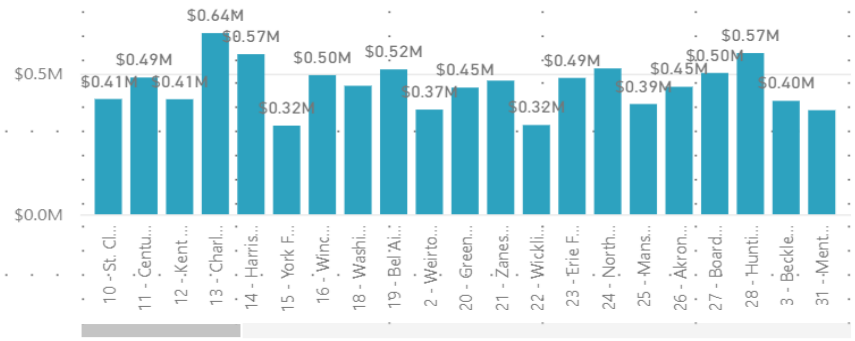
Sensitivity — Sensitivity

Publish — Share

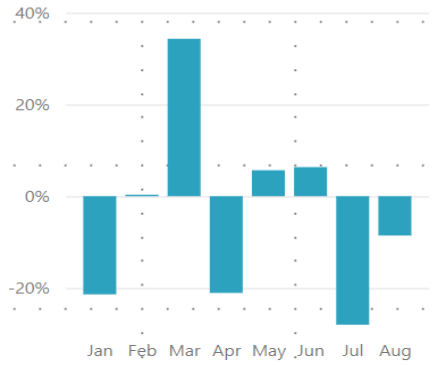
District Monthly

District Manager
- Allan Guin...
- Andrew Ma
- Annelie Z...
- Brad Sutton
- Carlos Grilo
- Chris Gray
- Chris McG...
- Tina Lassila
- Valery Us...

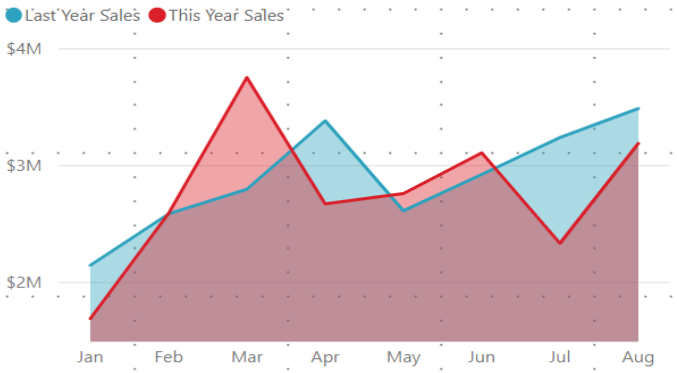
This Year Sales by StoreNumberName



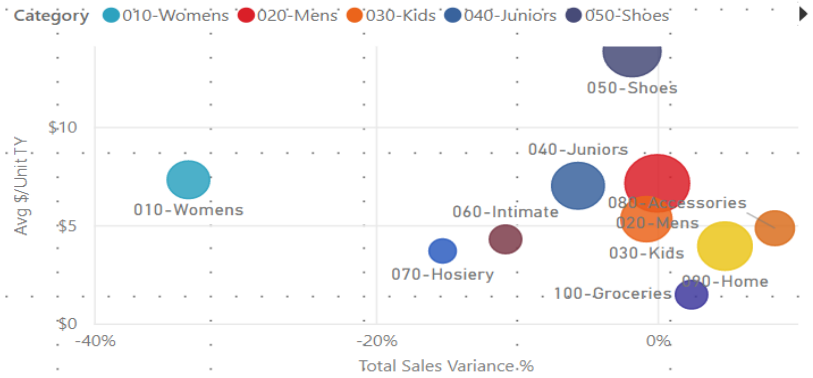
Total Sales Variance % by FiscalMonth



Last Year Sales and This Year Sales by FiscalMonth



Total Sales Variance %, Avg $/Unit TY and This Year Sales by Category and Category



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Filters

Search

Filters on this page
- Category is (All)
- Chain is (All)
- District is (All)
- DM is (All)
- FiscalMonth is (All)
- Name is (All)

Add data fields here

Filters on all pages

Add data fields here

Visualizations

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Fields

Search

- Sales
- District
- Item
- Store
- Time

Info | Overview | District Monthly Sales | New Stores | +

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Business Intelligence (BI)

- The need for BI was **derived from the concept that managers with inaccurate or incomplete information will tend, on average, to make worse decisions than if they had better information.**
- Creators of **financial models recognize this as "garbage in, garbage out."**
- BI **attempts to solve this problem by analyzing current data that is ideally presented on a dashboard of quick metrics designed to support** better decisions.
- After adopting BI into their business models include faster, more accurate reporting and analysis, improved data quality, better employee satisfaction, reduced costs, and increased revenues, and the ability to make better business decisions.

Types of BI Tools and Software

Spreadsheets: Spreadsheets like Microsoft Excel and Google Docs are some of the most widely used BI tools.

Reporting software: Reporting software is used to report, organize, filter, and display data.

Data visualization software: Data visualization software translates datasets into easy-to-read, visually appealing graphical representations to quickly gain insights.

Data mining tools: Data mining tools "mine" large amounts of data for patterns using things like artificial intelligence, machine learning, and statistics.

Online analytical processing (OLAP): OLAP tools allow users to analyze datasets from a wide variety of angles based on different business perspectives.

Examples of BI

Lowe's Corp

- Lowe's Corp, which operates the nation's second-largest home improvement retail chain, is one of the earliest big-box adopters of BI tools. Lowe's. "Microstrategy to Provide Additional Reporting and Analytics Tools for Lowe's."
- Specifically, it has leaned on BI tools to optimize its supply chain, analyze products to identify potential fraud, and solve problems with collective delivery charges from its stores.

Coca-Cola Bottling Company

- Coca-Cola Bottling had a problem with its daily manual reporting processes: they restricted access to real-time sales and operations data. But by replacing the manual process with an automated BI system, the company completely streamlined the process and saved 260 hours a year (or more than six 40-hour work weeks). Now, the company's team can quickly analyze metrics like delivery operations, budget, and profitability with just a few clicks.

How Business Intelligence Systems are Implemented?

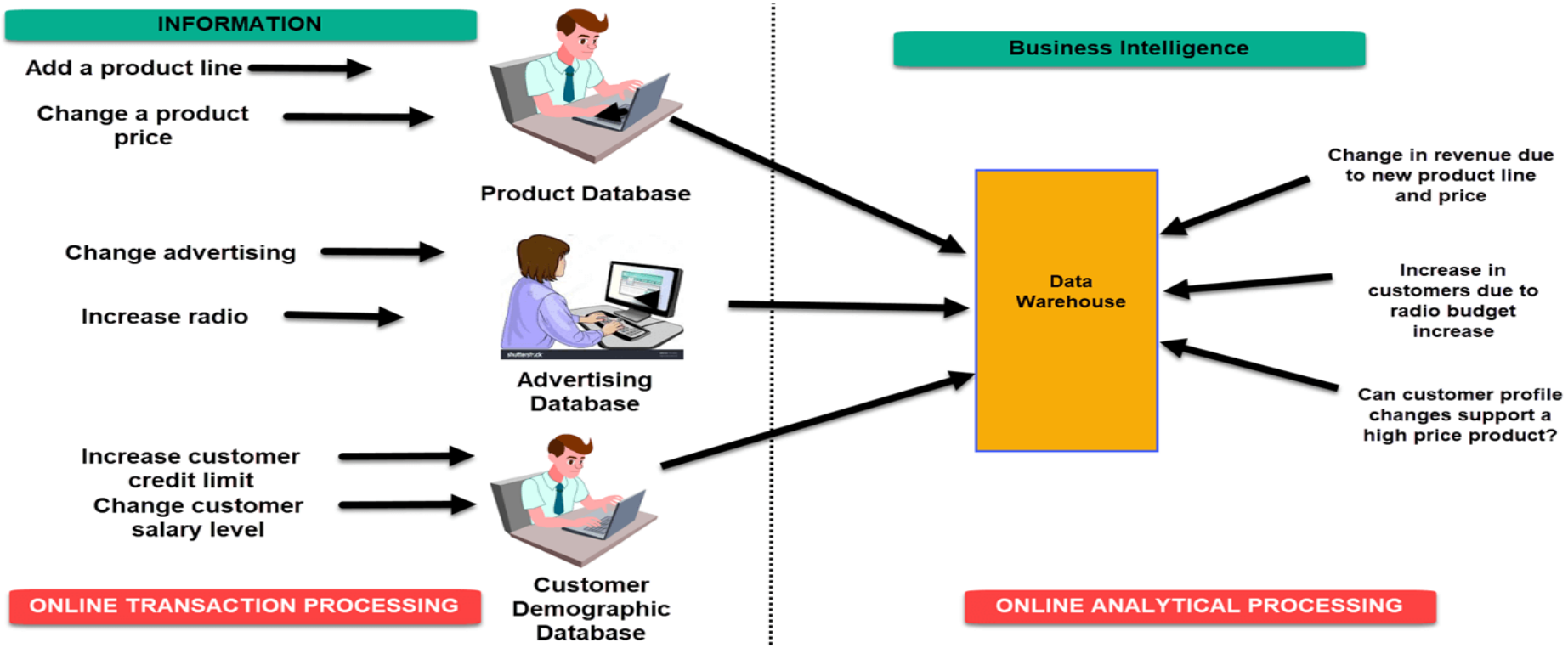
Step 1) Raw Data from corporate databases is **extracted**. The data could be spread across multiple systems heterogeneous systems.

Step 2) The data is cleaned and **transformed** into the data warehouse. The table can be **linked**, and data cubes are formed.

Step 3) Using BI system the user can **ask quires, request** ad-hoc reports or conduct any other analysis.

Examples of Business Intelligence System used in Practice

- A hotel owner uses BI analytical applications to gather statistical information regarding average occupancy and room rate. It helps to find aggregate revenue generated per room.
- By analyzing these trends year by year, month by month and day by day helps management to offer discounts on room rentals.



Digital Dashboard

Digital Dashboards

- A digital dashboard is **an analysis tool that allows business users to monitor and analyze their most important data sources in real-time.**
- With interactive data visualizations, digital dashboards allow for an **improved decision-making process and continuous growth.**
- The user can then **oversee many critical areas by displaying historical trends, actionable insights, and real-time information in a digestible, presentational format.**
- For More details: https://databox.com/digital-dashboard#3
- https://clickup.com/blog/how-to-create-a-dashboard-in-excel/

RevenueKPIRpt - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Paste Cut Copy Format Painter | Clipboard
Calibri 11 | Font
Wrap Text Merge & Center | Alignment
General | Number
Conditional Formatting Format as Table Cell Styles | Styles
Insert Delete Format | Cells
AutoSum Fill Clear Sort & Filter Find & Select | Editing

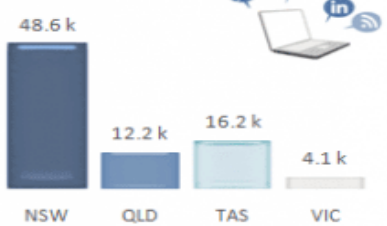
Z2

Dashboard Revenue Expense Staffing

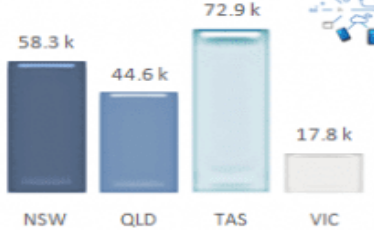
858 k Group Revenue
572 k Group Expense
24 Staff
26.0% Net Profit Margin
1.45 Debt Coverage Ratio
2018 2019 2020

Marketing

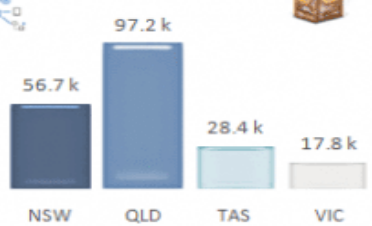
Expense by Dept



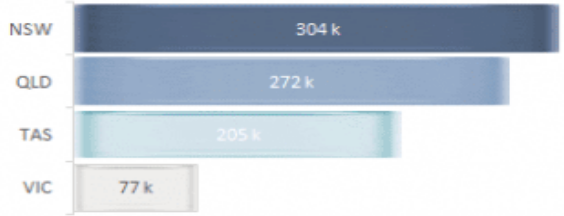
Information Tech



Sales



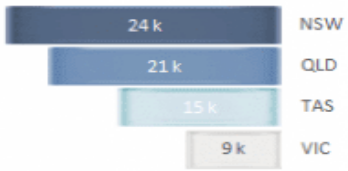
Revenue by State 000s



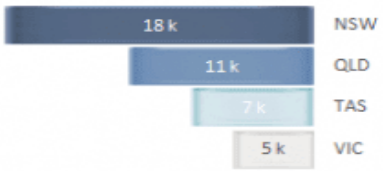
Cash Flow CY 85 k ↑
Payable Avg 60.6 ↓
Receivable Avg 58.7 ↑

Strategy

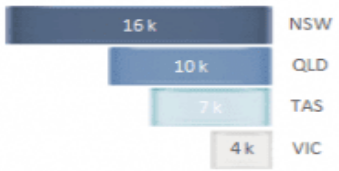
Expense by Dept



Finance

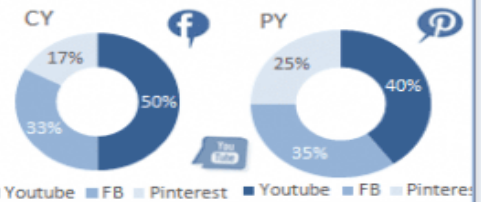


HR



Staffing by State

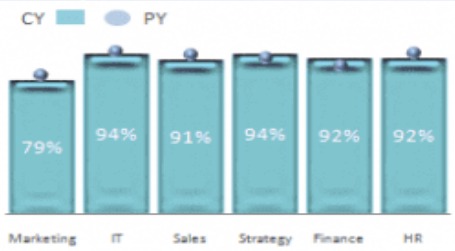
Social Spend YouTube FB Pinterest



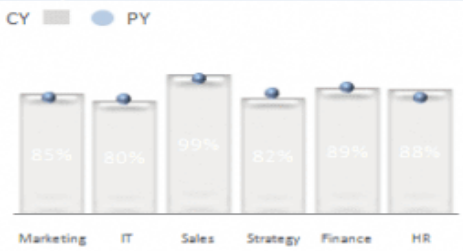
NSW Operational Effectiveness YOY

QLD Operational Effectiveness YOY

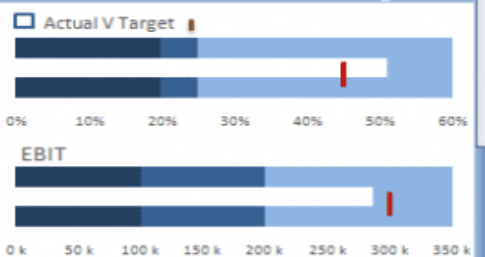
TAS Operational Effectiveness YOY



VIC Operational Effectiveness YOY



% of eCommerse Sales Actual V Target



Model List Ops KPI Data Calc Chart Check Dash

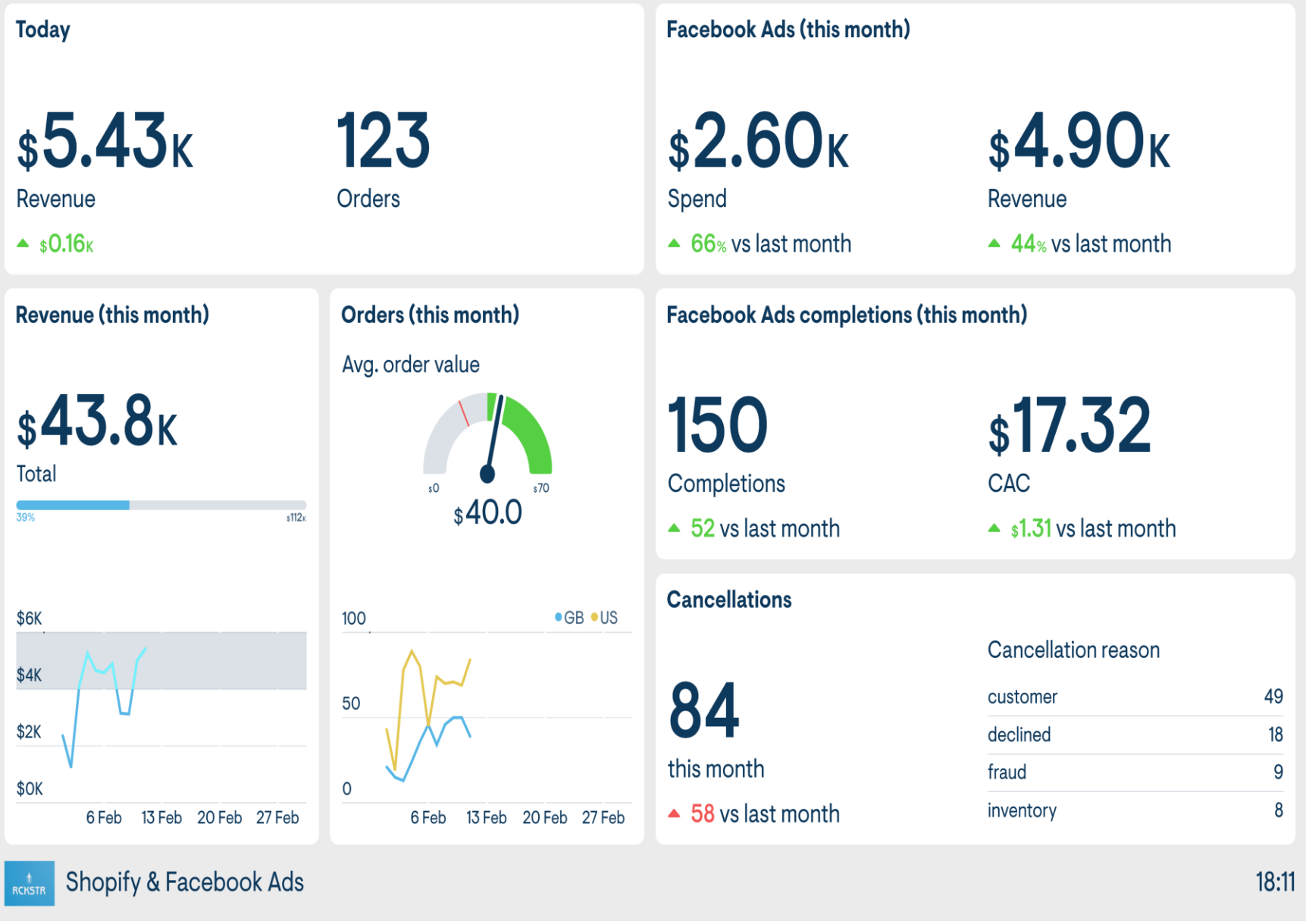
Ready 70%

Marketing dashboard

- **Focus area**
  - Digital marketing and campaigns
- **Who looks at it?**
  - Digital Marketing Manager, Marketing team
- **How often?**
  - Every day

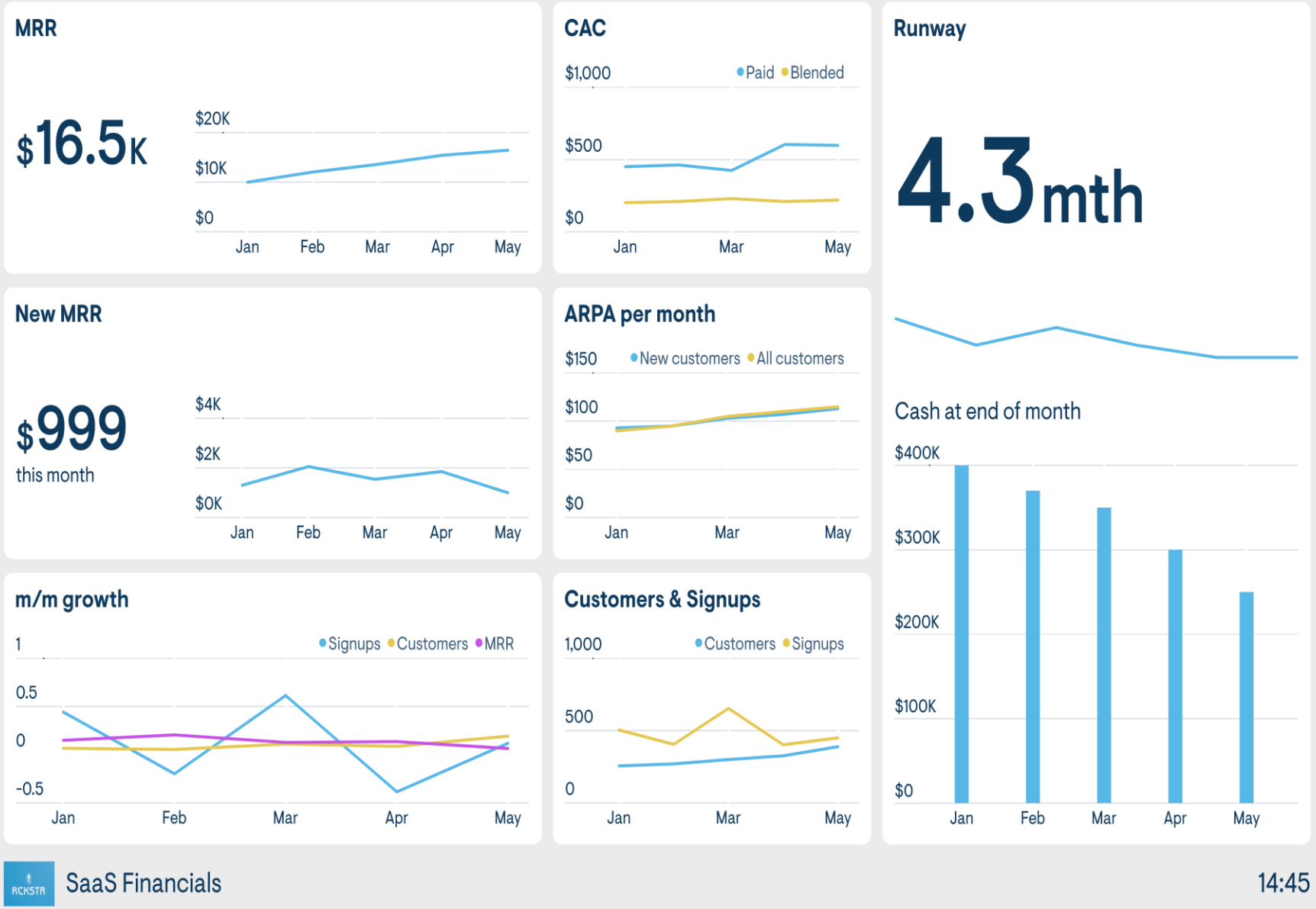
E-commerce Dashboard

- **Focus area**
  - Digital marketing and campaigns
- **Who looks at it?**
  - Digital Marketing Manager, Marketing team
- **How often?**
  - Every day



Finance Dashboard

- **Focus area**
  - Financial health and performance
- **Who looks at it?**
  - CEO, Finance Director, whole company
- **How often?**
  - Several times a month



Company Dashboard

- **Focus area**
  - Company overview
- **Who looks at it?**
  - Everyone
- **How often?**
  - Every day

Benefits of Digital Dashboards

- **Accessibility**
  - Digital dashboards provide intuitive data visualization features that make it easy for anyone to understand and utilize. This enables employees at all levels to access data and insights to improve their work.
- **Decision-making**
  - Digital dashboards centralize data processing and display, facilitating data-driven decision-making and clarifying business goals. Users can analyze important metrics and gain insights quickly, leading to faster decision-making across various aspects of the business.
- **Flexibility**
  - Digital dashboards are highly customizable, allowing users to visualize relevant data in one place. Additionally, they can be accessed via mobile devices, enabling employees to quickly access information regardless of their location.

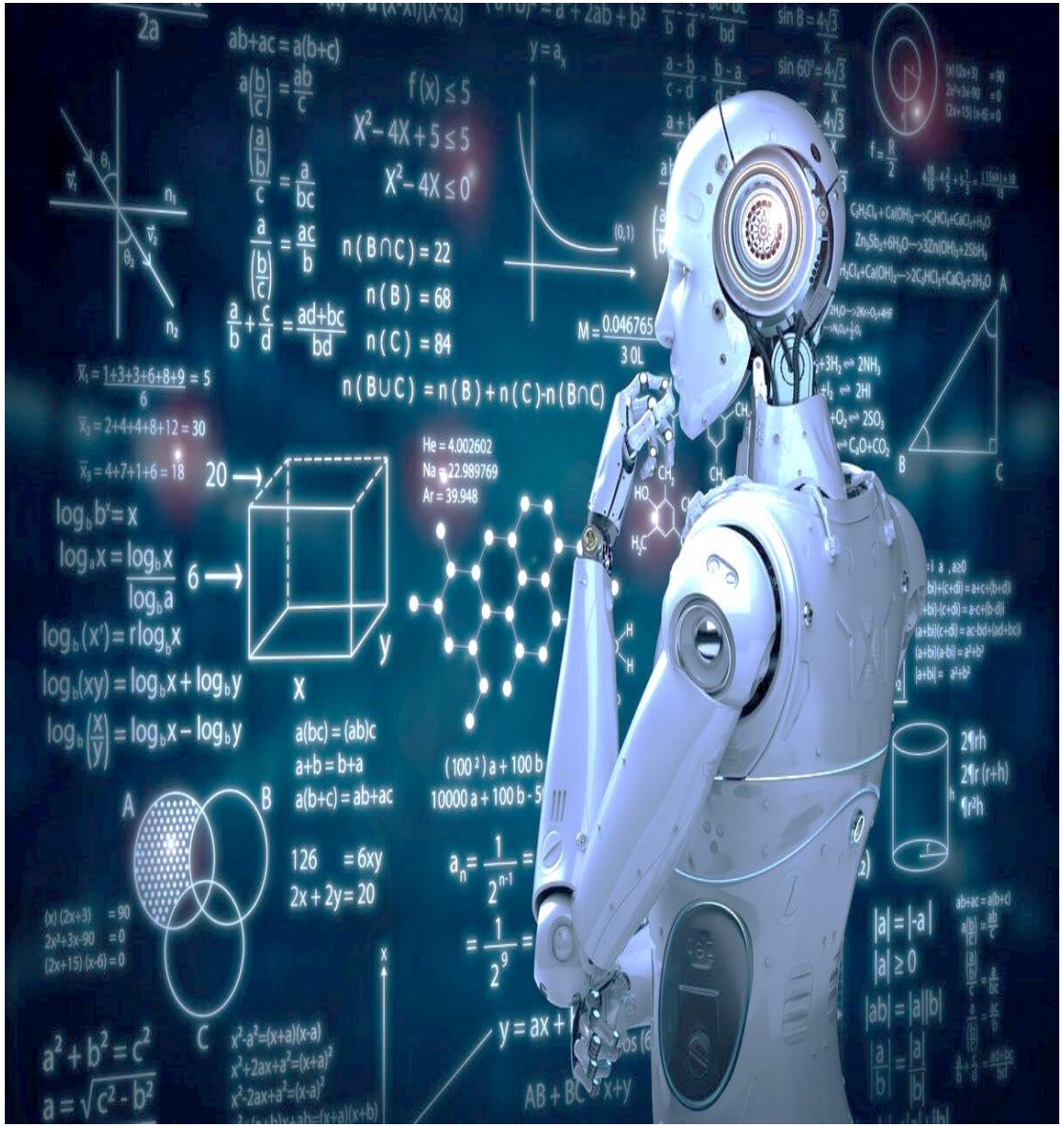
Benefits of Digital Dashboards

- **Business intelligence**
  - By accessing past, real-time, and predictive analytics, as well as clear indicators for growth and development, digital dashboards enhance the business intelligence skills of teams, giving them a competitive advantage.
- **Benchmarking**
  - Digital dashboards feature dynamic visual key performance indicators (KPIs) that provide real-time information and help businesses define benchmarks aligned with their objectives.

Artificial Intelligence, Machine Learning – Expert System

Artificial Intelligence (AI)

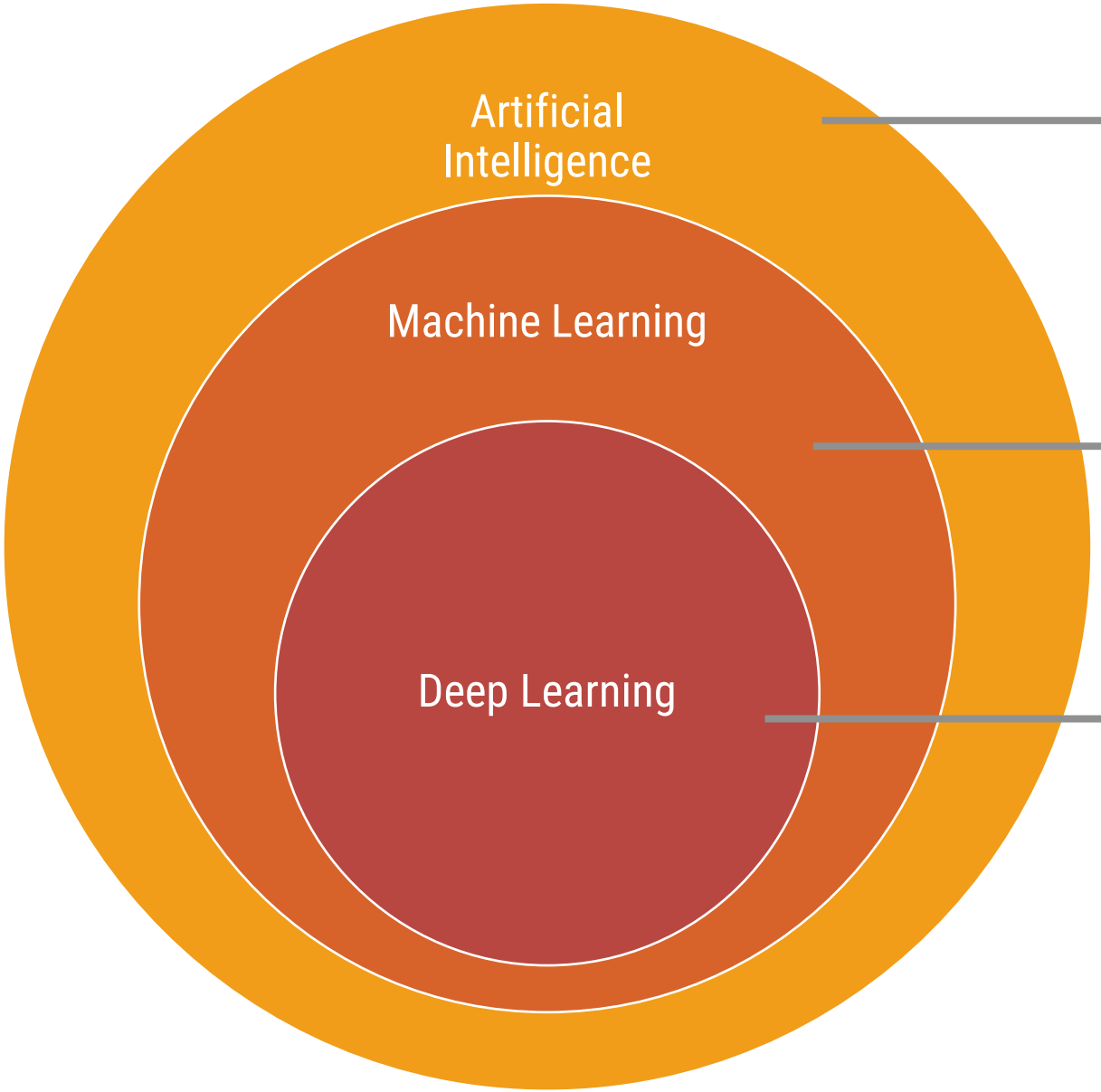
- Artificial intelligence (AI) refers to **computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems.**
- Artificial intelligence (AI) is the **theory and development of computer systems capable of performing tasks** that historically required human intelligence, such as recognizing speech, making decisions, and identifying patterns.
- AI is an umbrella term that encompasses a wide variety of technologies, including **machine learning, deep learning, and natural language processing (NLP).**



Machine Learning

- Machine learning is **a branch of artificial intelligence (AI) and computer science** which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.
  - **Algorithms:** a set of rules that must be followed when solving a particular problem.
    - IBM has a rich history with machine learning.
- In ML, **algorithms are trained on large datasets to identify patterns and relationships in the data, which can then be used to make predictions or decisions.** ML algorithms can be supervised, unsupervised, or semi-supervised, depending on the nature of the data and the task at hand.

AI v/s ML v/s DL



It enables the machine to think…(Without any human intervention)

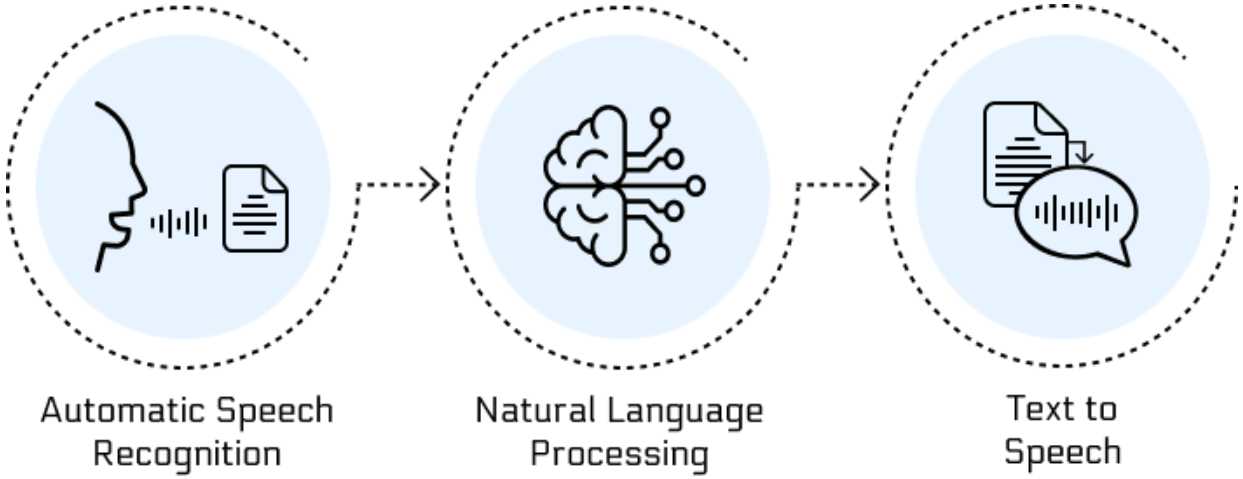
Statistical Model to explore and analyse

Works on large dataset

Natural Language Processing (NLP)

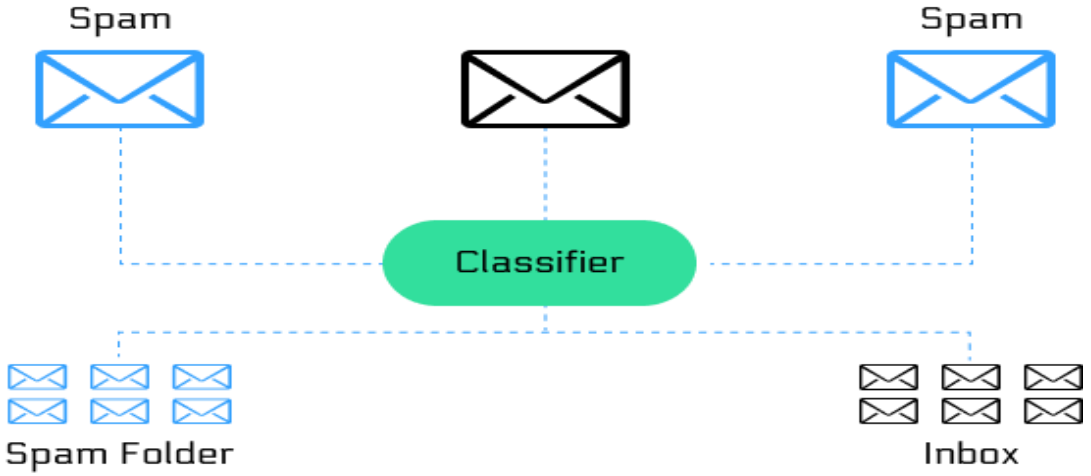
- **Natural Language Processing (NLP)** is a subfield of artificial intelligence (AI). It helps machines process and understand the human language so that they can automatically perform repetitive tasks.
  - Examples include machine translation, summarization, ticket classification, and spell check.

Automatic Speech Recognition



Most popular NLP tasks involves the reliable transformation of voice data into full-fledged text.

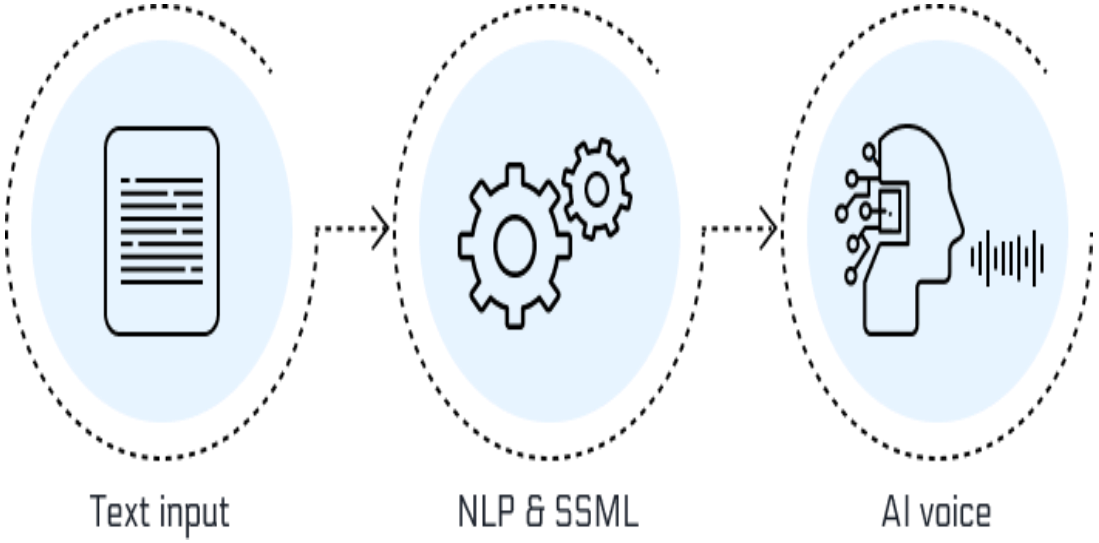
Text classification



The system faces the task of assigning a category or class to a certain fragment of text entered in natural language.

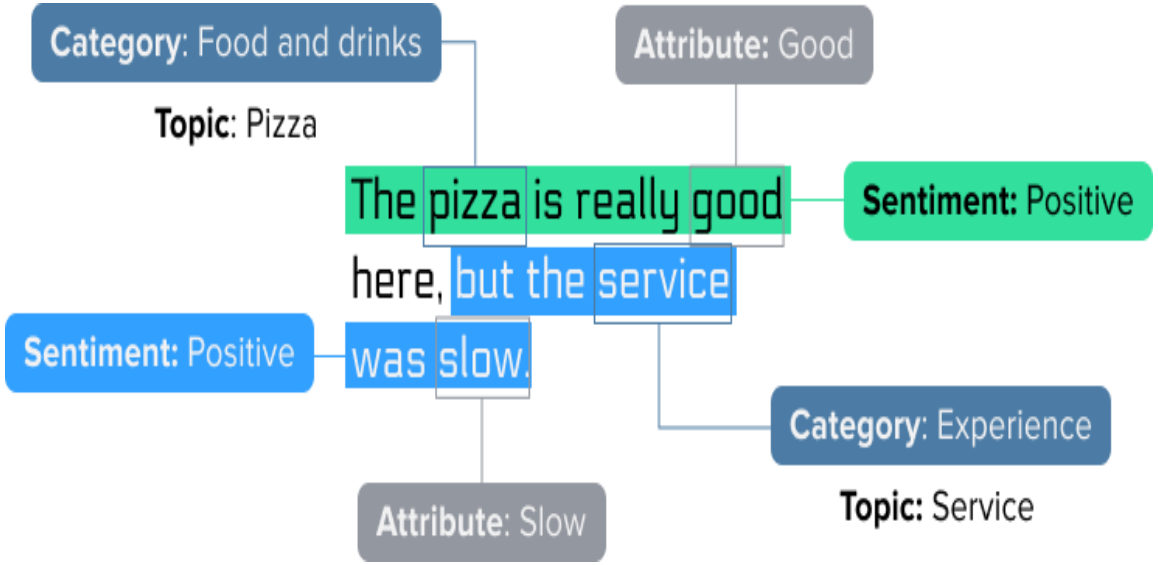
Natural Language Processing (NLP)

Text-to-speech



The opposite task of ASR is converting text to audio. Then the task of NLP is to justify the information and give it in human language.

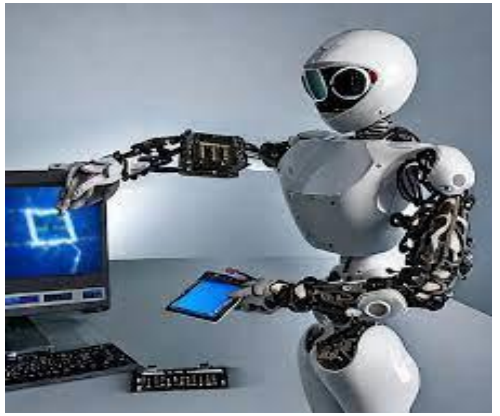
Sentiment analysis



The system can analyze whether it has a complaint, a request, or an opinion. The use of such a service is reduced even to reviews of products in the supermarket, not to mention the widespread use in the marketing field to assess the level of sales and customer interest.

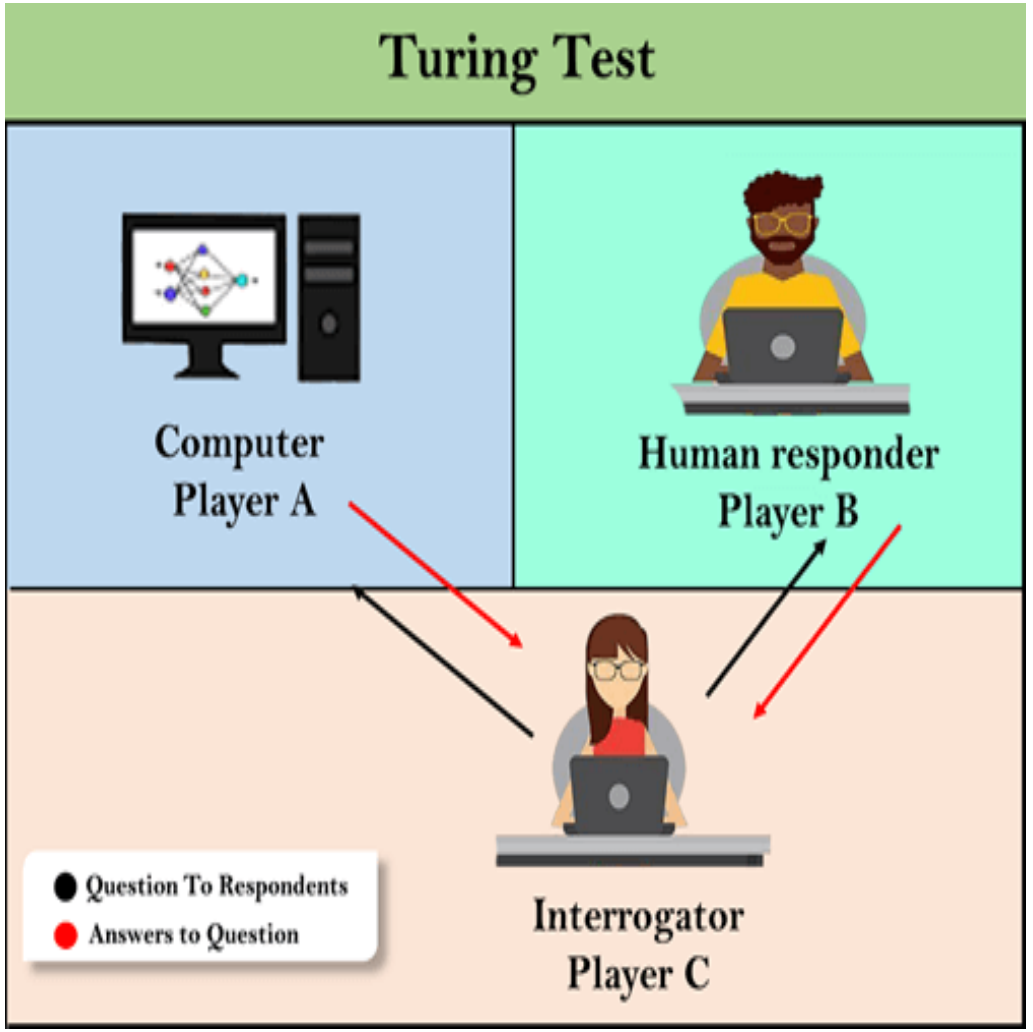
Robotics

- Robotics is the **branch of engineering and computer sciences** where machines are built to perform programmed tasks without further human intervention.
- A simple, mechanical arm that assembles cars, all the way to something out of science fiction like Wall-E or Amazon's upcoming Astro 'Alexa on wheels' home robot.
- Traditionally, robots are used when tasks are either too difficult for humans to perform well. A robot will happily do the same exhausting task over and over again each day. A human will get bored, fatigued, or both and that's when mistakes slip in.
  - **Robotics for households**
  - **Robotics in manufacturing**
  - **Robotics in healthcare**



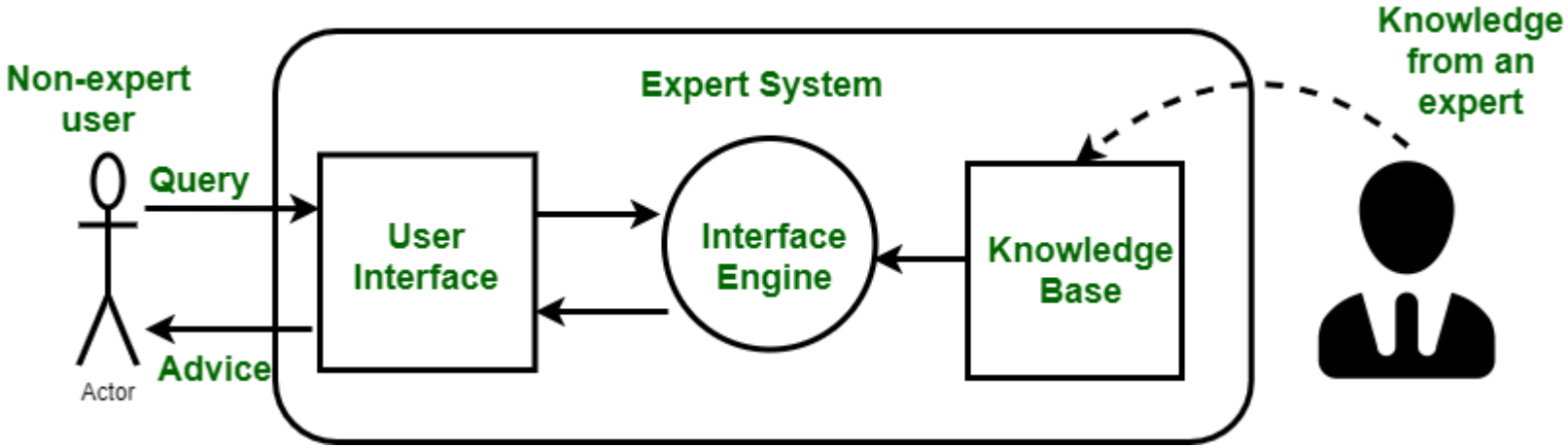
Turning Test

- The Turing Test is a deceptively **simple method of determining whether a machine can demonstrate human intelligence.**
- If a machine can engage in a conversation with a human without being detected as a machine, it has demonstrated human intelligence.
- The **Turing Test was proposed in a paper published in 1950** by mathematician and computing pioneer Alan Turing.
- It has become a **fundamental motivator in the theory and development of artificial Intelligence (AI).**



Expert System

- An expert system is a computer program that uses artificial intelligence (AI) technologies **to simulate the judgment and behavior of a human or an organization that has expertise and experience in a particular field.**
- Expert systems are **usually intended to complement, not replace, human experts**.
- The process of building and maintaining an expert system is called knowledge engineering. Knowledge engineers ensure that expert systems have all the necessary information to solve a problem.



Successful Expert System

- Countrywide Funding Corporation in Pasadena, California, **uses an expert system to improve decisions about granting loans.**
- Con-Way Transportation built an **expert system to automate and optimize planning of overnight shipment routes** for nationwide freight-trucking business.
- Most expert systems deal with problems of classification
  - Have relatively **few alternative outcomes**
  - Possible **outcomes are known** in advance
- Many expert systems require large, lengthy, and expensive development and maintenance efforts
  - Hiring or training more experts may be **less expensive**

How does an Expert System work?

- Modern **expert knowledge systems use machine learning and artificial intelligence to simulate the behavior or judgment** of domain experts.
- These systems can **improve their performance over time** as they gain more experience, just as humans do.
- Expert systems **accumulate experience and facts in a knowledge base and integrate them with an inference or rules engine** - a set of rules for applying the knowledge base to situations provided to the program.

Applications of Expert Systems

- Applications of expert systems in MIS can be found in various domains, including:
- **Medical Diagnosis:** Expert systems can assist in diagnosing medical conditions by analyzing symptoms and medical history.
- **Financial Planning:** Expert systems can provide advice on investment strategies, financial planning, and risk management.
- **Troubleshooting and Maintenance:** In industries, expert systems can assist in diagnosing equipment failures and recommending maintenance procedures.
- **Customer Support:** Expert systems can be used in customer support systems to provide automated assistance and troubleshooting.
- **Decision Support Systems (DSS):** Expert systems can be integrated into DSS to enhance decision-making processes.

Applications of Expert Systems

- **Healthcare:** where they assist with medical diagnoses.
- **Agriculture:** where they forecast crop damage.
- **Transportation:** where they contribute in a range of areas, including pavement conditions, traffic light control, highway design, bus and train scheduling and maintenance, and aviation flight patterns and air traffic control.
- **Law:** where automation is starting to be used to deliver legal services, and to make civil case evaluations and assess product liability.

Examples of Expert System

- **CaDet** (Cancer Decision Support Tool) is used to identify cancer in its earliest stages.
- **DENDRAL** helps chemists identify unknown organic molecules.
- **DXplain** is a clinical support system that diagnoses various diseases.
- **PXDES** determines the type and severity of lung cancer a person has.
- **R1/XCON** is an early manufacturing expert system that automatically selects and orders computer components based on customer specifications.