# MIS

History, Components, and Applications

# Management, Information, Systems

- Management refers to the process of coordinating and overseeing the activities of an organization to achieve defined objectives.

- Information refers to data that has been processed and organized in a meaningful way, making it useful for decision-making.

- A system is a set of interrelated components that work together to achieve a common goal. In MIS, a system typically refers to a combination of hardware, software, data, procedures, and people that interact to process data and produce information.

# Data, Information, Knowledge

- Data: Raw facts and figures without context, such as numbers (200) or text (James).

- Information: Data that has been processed and interpreted to provide meaning. For example, 200 units sold, First name: James.

- Knowledge: Information that has been further processed, analyzed, and combined with experience, insights, and context to create a deeper understanding. It is used to inform decisions and actions. For example, "the average daily sales for the past three days is 200 units" may give the knowledge of "Implementing a promotional campaign on weekdays increases daily sales by 20% based on past trends".

# A Brief History of MIS

- 1950s-1960s: Emergence of early computer systems for data processing.
- 1970s: Introduction of Decision Support Systems (DSS).
- 1980s: Rise of Personal Computers (PCs), office automation, and relational databases.
- 1990s: ERP systems gain popularity.
- 2000s: Internet and E-business
- 2010s: Big data, cloud computing, and Business Intelligence (BI).
- Present: AI-driven business operation.

# Early Business Applications

- IBM 1401 computer
- Banking systems
- Reservation systems in airlines, hotels.
- Inventory Control
- Manufacturing process control
- DSS

# Data Input: IBM 1401 Punched Card

# The SABRE System – A Case Study

- SABRE stands for Semi-Automatic Business Research Environment, developed in 1950s, 1960s, 1970, 1980s, 1990s, 2000s, 2010s, 2020s…
- It was developed to solve the challenges of managing an increasingly complex reservation system.
  - A serendipitous conversation led to a groundbreaking partnership between American Airlines and IBM.
- It took several years of intensive development to bring the system to life.
  - The project was ambitious, aiming to create a real-time computer network that could handle the reservation needs of American Airlines across the entire United States.
  - In 1964, two IBM mainframe computer with 1,000 terminals installed in airports and ticket offices

# Sabre Basics (YouTube Video): https://www.youtube.com/watch?v=X7YeDQ8eBhE

# Impact and Legacy

1. Efficiency and Accuracy: SABRE automated the booking process, significantly reducing the time required to make a reservation from hours to just a few seconds.

2. Competitive Advantage: The system gave American Airlines a significant competitive edge. By streamlining operations and improving customer service, American Airlines was able to attract more passengers and operate more efficiently than its competitors.

3. Industry Transformation: SABRE set a new standard for the airline industry. Other airlines soon recognized the benefits of such systems, leading to widespread adoption of similar technologies.

4. Technological Innovation: The collaboration between American Airlines and IBM showcased the possibilities of real-time computing and networking. The technologies and methodologies developed for SABRE influenced future innovations in computer science and information systems.

# 1960s: MRP (Material Requirements Planning)

- Balancing production with demand
- Managing inventory levels
- Scheduling production processes

# 1970s: MRP1

- Generating schedules for operations and raw material purchases
- <span style="color:red">Tracking orders</span>

# 1980s: MRP II

- Coordinating manufacturing processes
- Managing product planning, parts purchasing, and inventory control
- Tracking product distribution and shipping
- Automating <span style="color:red">accounting and financial</span> processes

# 1990s: ERP Enterprise Resource Planning

- **Financial** management (accounting, budgeting, forecasting)
- **Human resource** management (payroll, benefits, performance management)
- **Supply chain** management (procurement, inventory management, logistics)
- **Customer relationship** management (sales, marketing, customer service)

# 2000s: ERP II or Enterprise Systems (ES)

- Business intelligence (data analytics, reporting, dashboards)
- Extended ERP. Integration with other systems, such as Customer Relationship Management (CRM) and Supply Chain Management (SCM).
- E-business and e-commerce capabilities

# Present Day

- Cloud-based deployment options
- Mobile accessibility and apps
- Artificial intelligence and machine learning integration
- Internet of Things (IoT) connectivity

# AI in Business

- AI can automate repetitive and time-consuming tasks, freeing up human resources for more strategic activities.
  - For instance, Robotic Process Automation (RPA) is used to handle routine tasks such as data entry, invoice processing, and customer service inquiries.
- AI systems can analyze large volumes of data to uncover patterns, trends, and insights that would be difficult to detect manually.
- Natural Language Processing (NLP) is a feature of AI that enables machines to understand, interpret, and respond to human language.

# AI Applications

- In customer service, AI-powered chatbots and virtual assistants handle customer inquiries, provide support, and resolve issues 24/7.

- Companies like Unilever use AI to screen job applicants by analyzing video interviews, assessing facial expressions, tone of voice, and word choice.

- IBM Watson Health, for example, assists doctors by analyzing medical records and research papers to provide evidence-based treatment options.

# AI Challenges

- Data Quality and Availability

- Integration with Existing Systems

- Talent Shortage

- Ethical and Legal Concerns

- Security Risks: AI systems can introduce new security vulnerabilities, as they often require access to sensitive data and critical business operations.

# MIS Components

- People are the most important component of any MIS. They include the users who interact with the system and the IT professionals who design, implement, and maintain it.

- Processes refer to the methods and procedures that define how tasks are performed within the organization. In the context of MIS, processes are the structured activities that transform raw data into meaningful information.

- Data is the raw material that drives an MIS. It includes all the facts, figures, and statistics that are collected, processed, and stored by the system. Data can come from various sources, including internal operations, customer interactions, market research, and external databases.

# IT Platform

- Hardware
- Software
    - System software
    - Business applications

# Business Applications

- ERP: all common business operations
- CRM: customer-centric sales and marketing
- SCM: business partners
- BI: reporting and prediction

# The Vizio Case

- William Wang's career began in customer service for a company that manufactured computer monitor

- In the early 2000s, Wang encountered LCD TV technology and recognized its potential to revolutionize home entertainment.

- Driven by this insight, Wang made a bold decision to refinance his house to fund the creation of a prototype LCD TV. In 2002, he launched Vizio with the mission to make high-quality LCD and plasma TVs affordable for everyone.

- He brough his product to Costco, all he asked is a spot to demo his LCD in Costco entrance and Vizio will take care of all customer supports.

- At the end the meeting, he said that he will beat SONY in five years, nobody believed it but agreed to give him a chance as the risk is low.

- By the second quarter of 2003, Vizio's products were on Costco shelves.

- By the fourth quart of 2007, Vizio's market share had soared to 14.2%, surpassing Sony's 12.5%. (source: https://www.eetimes.com/established-lcd-tv-brands-strike-back-in-q4-2007-says-isuppli/)